

ENGINES OF INFLUENCE: TURKEY'S DEFENSE INDUSTRY UNDER ERDOGAN

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INTRODUCTION

Turkish weaponry is helping Ukrainian troops fight off the Russian invasion of their homeland.¹ The chief of Ukraine's air force called the Turkish-built TB-2 drones "life-giving" as he confirmed they had struck Russian targets.² *Time* magazine called the TB-2 "Ukraine's Secret Weapon Against Russia."³ Yet Turkey's Deputy Foreign Minister Yavuz Selim Kiran underscored that Ankara did not provide these drones to Kyiv as military aid, saying, "They are products Ukraine purchased from a private company."⁴ Ankara's delicate balancing act between Moscow and Kyiv is partly a result of its ongoing attempts to find alternatives to NATO weapons systems by developing an indigenous defense industry, tapping into Ukrainian defense technology, and purchasing the S-400 air defense system from Russia.⁵

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1. All the information in this report was current as of Russia's invasion of Ukraine on February 24, 2022. The course and outcome of the war may reshape the Turkish arms industry and Turkey's foreign and security policy, including defense cooperation with Ukraine. The authors would like to thank FDD's Bradley Bowman, David Adesnik, John Hardie, and Tzvi Kahn for their feedback and edits, both substantive and stylistic, and FDD's Daniel Ackerman, Allie Shisgal, and Erin Blumenthal for the design and production of this research memo. The authors are also grateful for the research assistance provided by FDD Turkey Program interns Kürşat Gök, Sude Akgündoğdu, and Umut Can Fidan and by FDD Center on Military and Political Power interns Andrew Tobin, Daniel Muncaster, and Ryan Zaybekian. We also wish to thank Axel Çorlu and Lauren Harrison for taking time out of their busy schedules to provide crucial feedback on our work. Any errors are ours alone.

2. Brett Forrest and Jared Malsin, "Ukraine Says It Used Turkish-Made Drones to Hit Russian Targets," *The Wall Street Journal*, February 27, 2022. (<https://www.wsj.com/livecoverage/russia-ukraine-latest-news-2022-02-26/card/ukraine-says-it-uses-turkish-made-drones-to-hit-russian-targets-DrigGO7vkGfDzbBuncnA>)

3. Billy Perrigo, "Ukraine's Secret Weapon Against Russia: Turkish Drones," *Time*, March 1, 2022. (<https://time.com/6153197/ukraine-russia-turkish-drones-bayraktar>)

4. Onur Şahanoğlu, "Bayraktar TB-2 SİHA manipülasyonuna Dışişleri'nden çok net yanıt: Bu bir yardım değil, sadece Ukrayna'ya satılmadı [A very clear response from the Foreign Ministry to the Bayraktar TB-2 UCAV manipulation: This is not aid, it wasn't sold only to Ukraine]," *Sabah* (Turkey), March 3, 2022. (<https://www.sabah.com.tr/gundem/2022/03/03/son-dakika-batinin-bayraktar-tb-2-siha-manipulasyonuna-disislerinden-cok-net-yanit-bu-bir-yardim-degil-sadece-ukraynaya-satilmadi>)

5. Dimitar Bechev, "Turkey, between a rock and a hard place on Russia," *Politico Europe*, March 2, 2022. (<https://www.politico.eu/article/turkey-between-a-rock-and-a-hard-place-on-russia>); Aykan Erdemir, "Erdogan's Balancing Act Between Russia and Ukraine," *The Globalist* (Germany), March 3, 2022. (<https://www.theglobalist.com/erdogans-balancing-act-between-russia-and-ukraine>)

Turkish weaponry has also shaped the outcomes of several recent clashes in the Middle East and beyond.⁶ In Syria, the TB-2 helped defeat a Russia-backed Syrian government offensive in Idlib in 2020.⁷ In Libya, Turkish arms helped turn the tide against an offensive by the self-styled Libyan National Army of Khalifa Haftar.⁸ In the Nagorno-Karabakh conflict, Turkish drones contributed to a decisive Azerbaijani victory.⁹ Turkey's ongoing effort to launch fixed-wing drones from its first multipurpose amphibious assault ship, the TCG Anadolu, has the potential to bring Turkish drones into action in other conflicts.¹⁰ Given their combat record and substantial interest from international buyers, Turkish arms will continue to play a role in combat in multiple theaters of interest to the United States and NATO.

However, there has been a backlash in response to civilian casualties resulting from the use of Turkish drones, as well as Ankara's lack of concern for how buyers use its weapons. For example, Turkish drone strikes in northeast Syria¹¹ and Iraqi Kurdistan,¹² which left children dead or injured, have drawn criticism. In January, following a Turkish drone strike in northeast Syria where a 4-year-old boy lost his leg, Nadine Maenza, the chair of the U.S. Commission on International Religious Freedom, called out Ankara's "drone attacks on civilians" as "destabilizing."¹³ Similarly, Ethiopia caused a global outcry in February with its use of Turkish drones in strikes that killed nearly 60 civilians in a displaced people's camp in the country's northern region of Tigray.¹⁴

The potential roles Turkey's defense industry can play, both in strengthening NATO by deterring its adversaries and in undermining NATO and its values through trade and partnerships with the alliance's adversaries, require a concerted transatlantic strategy in relations with Ankara. Over the last few years, the appetite of Western countries to sell weapons systems and components to Turkey has diminished as Ankara's egregious human rights abuses at home and belligerent policy abroad have strained ties with its NATO allies.¹⁵ Many Western governments, including the United States, Canada, Germany, France, Spain, Sweden, and Austria, have instituted certain export

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6. Francis Fukuyama, "Droning On in the Middle East," *American Purpose*, April 9, 2021. (<https://www.americanpurpose.com/blog/fukuyama/droning-on>)

7. James Marson and Brett Forrest, "Armed Low-Cost Drones, Made by Turkey, Reshape Battlefields and Geopolitics," *The Wall Street Journal*, June 3, 2021. (<https://www.wsj.com/articles/armed-low-cost-drones-made-by-turkey-reshape-battlefields-and-geopolitics-11622727370>)

8. Seth J. Frantzman, "A Secretive Proxy Drone War Just Exploded in Libya," *The Jerusalem Post* (Israel), May 20, 2020. (<https://www.jpost.com/middle-east/a-secretive-proxy-drone-war-just-exploded-in-libya-628600>)

9. Robyn Dixon, "Azerbaijan's Drones Owned the Battlefield in Nagorno-Karabakh – and Showed Future of Warfare," *The Washington Post*, November 12, 2020. (https://www.washingtonpost.com/world/europe/nagorno-karabakh-drones-azerbaijan-aremenia/2020/11/11/441bcbd2-193d-11eb-8bda-814ca56e138b_story.html)

10. David Axe, "Behold The Turkish Navy's Drone Aircraft Carrier," *Forbes*, May 10, 2021. (<https://www.forbes.com/sites/davidaxe/2021/05/10/behold-the-turkish-navys-drone-aircraft-carrier>)

11. Layal Shakir, "Suspected Turkish drone kills child in Rojava," *Rudaw* (Iraq), February 10, 2022. (<https://www.rudaw.net/english/middleeast/syria/10022022>)

12. Rabez Majeed and Namu Abdulla, "Turkish Drone Strike Leaves Civilian Casualties," *Voice of America*, July 2, 2020. (https://www.voanews.com/a/extremism-watch_turkish-drone-strike-leaves-civilian-casualties/6192158.html)

13. Chenar Chalak, "US commissioner condemns 'destabilizing' Turkey in light of recent strikes in Kobane," *Rudaw* (Iraq), January 10, 2022. (<https://www.rudaw.net/english/middleeast/syria/10012022>)

14. Max Bearak, Meg Kelly, and Joyce Sohyun Lee, "How Ethiopia used a Turkish drone in a strike that killed nearly 60 civilians," *The Washington Post*, February 7, 2022. (<https://www.washingtonpost.com/world/interactive/2022/ethiopia-tigray-dedebit-drone-strike>)

15. Aykan Erdemir and Philip Kowalski, "Turkey" in *From Trump to Biden: The Way Forward for U.S. National Security*, John Hannah and David Adesnik, Eds. (Washington, DC: Foundation for Defense of Democracies, 2021), pages 64-67. (<https://www.fdd.org/analysis/2021/01/14/turkey>)

restrictions on Turkey. These restrictions have incentivized Ankara to find alternate suppliers and to build a domestic arms industry capable of producing advanced weapons.

Turkey currently relies on alternate suppliers as a stopgap measure and as a source of technology while building up its domestic arms industry over the long-term. Ankara's purchase of Russia's S-400 air defense system¹⁶ and its interest in Moscow's Su-35¹⁷ fighters reflect Ankara's shift to new defense partners. Turkey has been reasonably successful at reducing its dependency on arms imports,¹⁸ decreasing them by 59 percent in the five-year period of 2016-2020, as compared to 2011-2015.¹⁹ The government hopes that Turkey's move toward self-sufficiency will eventually enable the country to pursue a foreign and security policy less restricted by its transatlantic allies.

The expansion of Turkey's domestic arms industry is rooted not only in external factors, but also in domestic political concerns. The domestic production of advanced weapon systems has significant propaganda value, allowing Turkish President Recep Tayyip Erdogan to claim he is restoring Turkey to great power status, reminiscent of the Ottoman Empire. While Ankara often announces breakthroughs and new systems and then fails to deliver them, building a potent domestic arms industry may allow that propaganda to become reality.

A strong domestic arms industry could also help lift Turkey's struggling economy by boosting exports. The Turkish defense sector's total exports from 2016 through 2020 increased by 30 percent compared to 2011 through 2015. Exports also provide much needed foreign currency in light of Turkey's depleted net international reserves.²⁰

To date, the Turkish defense industry remains dependent on importing key inputs. The inability to produce engines is a major bottleneck that Ankara seeks to overcome. Turkey's indigenous arms industry is heavily reliant on importing engines for drones, armored vehicles, and ships, which Ankara then exports as complete systems. Ukraine is the most promising partner for defense cooperation with Turkey. Open-source data indicates significant cooperation on engine manufacturing.

At the same time, Turkey is heavily reliant on the United States and Germany for engines that it puts into armored vehicles. In developing its Altay main battle tank, Ankara tried to source an engine from German tank manufacturer Rheinmetall, but was stymied by an unofficial German embargo following Turkish incursions into northern Syria.

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16. Bradley Bowman, Aykan Erdemir, and Ryan Brobst, "U.S. Security Partners and Putin's S-400," *Foundation for Defense of Democracies*, April 29, 2021. (<https://www.fdd.org/analysis/2021/04/29/us-security-partners-and-putins-s-400>)

17. "Turkey Willing to Discuss Su-35, Su-57 Buy with Russia If Necessary," *Defense World*, March 12, 2021. (https://www.defenseworld.net/news/29138/Turkey_Willing_to_Discuss_Su_35_Su_57_Buy_with_Russia_if_Necessary)

18. Metin Gurcan, "Turkey's Defense Industry Suffers Setback but Future Remains Promising," *Al-Monitor*, September 14, 2021. (<https://www.al-monitor.com/originals/2021/09/turkeys-defense-industry-suffers-setback-future-remains-promising>)

19. "International Arms Transfers Level off after Years of Sharp Growth; Middle Eastern Arms Imports Grow Most, Says SIPRI," *Stockholm International Peace Research Institute*, March 15, 2021. (<https://www.sipri.org/media/press-release/2021/international-arms-transfers-level-after-years-sharp-growth-middle-eastern-arms-imports-grow-most>)

20. Turkey's net international reserves, excluding money borrowed from Turkish banks and foreign banks, were negative \$57 billion as of January 2022. Mustafa Sonmez, "Turkey's central bank continues window dressing with currency swaps," *Al-Monitor*, January 26, 2022. (<https://www.al-monitor.com/originals/2022/01/turkeys-central-bank-continues-window-dressing-currency-swaps>); Brad W. Setzwer, "The Changing Nature of Turkey's Balance Sheet Risks," *Council on Foreign Relations*, October 23, 2020. (<https://www.cfr.org/blog/changing-nature-turkeys-balance-sheet-risks>)

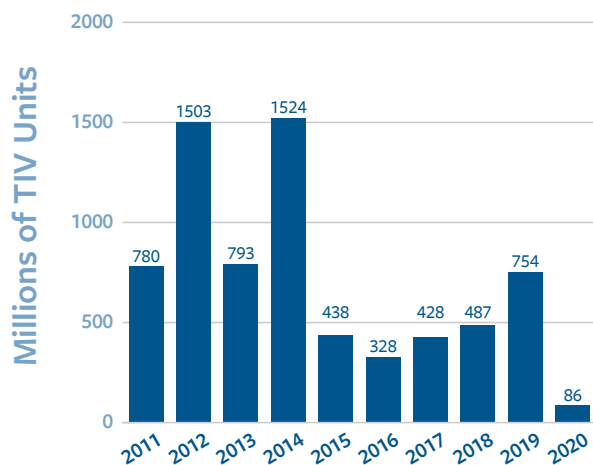
Turkey then turned to South Korean manufacturers Doosan and S&T Dynamics to supply Altay’s engine and transmission.²¹ Yet engine production remains a key vulnerability for the Turkish defense industry.

This report tracks recent trends in the Turkish defense industry and identifies the policy challenges it presents for the United States and its allies. Erdogan’s policies not only provide NATO’s adversaries with opportunities to exploit tensions within the transatlantic alliance, but also could lead to the proliferation of advanced capabilities to state and non-state actors that seek to challenge the United States. By wielding a mixture of positive and negative incentives and engaging with Turkey’s quasi-state defense industries to the exclusion of Erdogan’s loyalists, Washington can help deter Ankara from deepening its defense industry partnerships with Russia and other NATO adversaries. This could represent an important step toward bringing Turkey back into the NATO fold following a potential opposition victory in 2023.

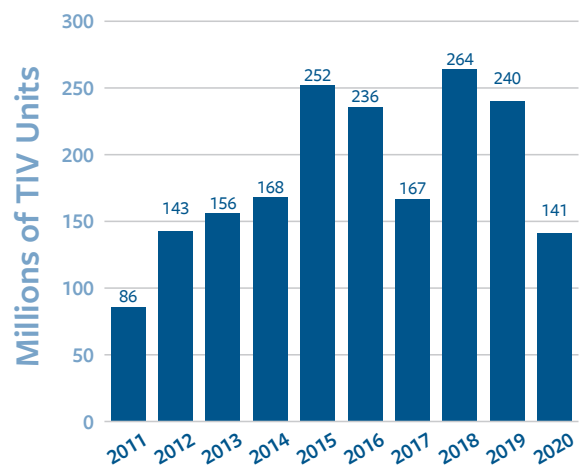
GROWTH OF MILITARY EXPORTS

According to data from the Stockholm International Peace Research Institute (SIPRI), total Turkish arms exports increased by 30 percent in 2016-2020 as compared to 2011-2015, while its imports fell by 59 percent in the 2016-2020 period in comparison to the 2011-2015 period.²² An 81 percent drop in imports from the United States to

Turkey’s Arms Imports, 2011-2020



Turkey’s Arms Exports, 2011-2020



21. Burak E. Bekdil, “Turkey, South Korea sign deal for Turkish Altay tank,” *Defense News*, October 25, 2021. (<https://www.defensenews.com/land/2021/10/25/turkey-south-korea-sign-deal-for-turkish-altay-tank>)

22. “SIPRI Databases,” *Stockholm International Peace Research Institute*, accessed March 4, 2022. (<https://www.sipri.org/databases>). The units included are SIPRI Trend Indicator Values (TIVs) expressed in millions. The SIPRI website explains TIVs as follows: *The TIV is based on the known unit production costs of a core set of weapons and is intended to represent the transfer of military resources rather than the financial value of the transfer. Weapons for which a production cost is not known are compared with core weapons based on: size and performance characteristics (weight, speed, range and payload); type of electronics, loading or unloading arrangements, engine, tracks or wheels, armament and materials; and the year in which the weapon was produced. A weapon that has been in service in another armed force is given a value 40 per cent of that of a new weapon. A used weapon that has been significantly refurbished or modified by the supplier before delivery is given a value of 66 per cent of that of a new weapon. SIPRI TIV figures do not represent sales prices for arms transfers. They should therefore not be directly compared with gross domestic product (GDP), military expenditure, sales values or the financial value of export licenses in an attempt to measure the economic burden of arms imports or the economic benefits of exports. They are best used as the raw data for calculating trends in international arms transfers over periods of time, global percentages for suppliers and recipients, and percentages for the volume of transfers to or from particular states.* For more, see: “Sources and methods,” *Stockholm International Peace Research Institute*, accessed March 4, 2022. (<https://www.sipri.org/databases/armstransfers/sources-and-methods>)

Turkey accounts for a large portion of the decline. Turkey’s imports from the United States made up 61 percent of its total imports from 2011 to 2015, compared to 29 percent of total imports from 2016 to 2020.

In financial terms, SIPRI data shows that Turkish arms exports rose from \$634 million in 2010 to \$2.74 billion in 2019. Turkish media reports indicate that \$2.78 billion worth of arms was exported in 2020, and \$3.22 billion in 2021, although currency fluctuation and lack of independent data make these numbers hard to confirm.²³

Turkish arms exports are primarily armored vehicles and ships, which make up 91 percent of the total. However, aircraft exports, especially drones, rose in 2021 and will likely continue to rise over the next several years.²⁴ What nominally Turkish-built armored vehicles, ships, and aircraft have in common is that they are all dependent on foreign engines, meaning that Turkish exports are still dependent upon foreign inputs.

Table 1: Turkish Weapon Exports in Millions of TIV Units by Category, 2016-2020

	2016	2017	2018	2019	2020	Total	Share of Total
Aircraft	--	--	--	30	6	36	3.44%
Armored vehicles	107	93	155	202	135	692	66.03%
Artillery	9	--	--	--	--	9	0.86%
Engines	--	--	--	2	--	2	0.38%
Missiles	7	4	6	6	1	22	2.10%
Sensors	--	8	16	--	--	24	2.29%
Ships	113	62	88	--	--	263	25.10%
Total	236	167	264	240	141	1048	---

A NETWORK OF NEPOTISM

Turkey has a rich array of quasi-state defense industries, which — until Erdogan’s consolidation of power during his first decade in government — used to be closely linked to the country’s once staunchly pro-secular military. Some of these quasi-state enterprises have a history of close cooperation with defense companies from the United States and other NATO nations. This includes cooperation in America’s flagship project for the manufacture of F-16s, integration of their on-board systems, and flight tests by Turkish Aerospace Industries, a U.S.-Turkish joint venture and a precursor to today’s Turkish Aerospace (TUSAS).²⁵

23. Goksel Yildirim, “Defense and aerospace industry closed 2021 with a new export record,” *Anadolu Agency* (Turkey), January 3, 2022. (<https://www.aa.com.tr/tr/ekonomi/savunma-ve-havacilik-sanayisi-2021-li-yeni-ihracat-rekoruyla-kapatti/2464139>)

24. Burak E. Bekdil, “Turkey kicks off serial production for armed trainer Hurjet,” *Defense News*, January 14, 2022. (<https://www.defensenews.com/industry/2022/01/14/turkey-kicks-off-serial-production-for-armed-trainer-hurjet>)

25. “About Us,” *Turkish Aerospace*, accessed March 4, 2022. (<https://www.tusas.com/en/corporate/about-us>)

Over the years, the Erdogan government has systematically purged pro-secular board members and executives from quasi-state defense firms and appointed loyalists to key positions.²⁶ Erdogan also helped create a group of private defense companies owned by his loyalists. He did so in part by nationalizing established defense contractors and then re-privatizing them under new ownership. Next, the government directed lucrative government tenders both to those re-privatized firms and to other private companies established or owned by Erdogan loyalists. The government subsequently uses state resources to keep these enterprises above water or acquire them if they go bankrupt. This has established a patronage network in which Erdogan's close supporters grow wealthy and, in turn, cement Erdogan's political control over major Turkish industries.

One example that raises questions about the independence of Turkish defense contractors is armored vehicle producer BMC, which the Savings Deposit Insurance Fund of Turkey (TMSF) seized in 2013. Established in 1983, the TMSF steadily lost autonomy after Erdogan's Justice and Development Party (AKP) rose to power in 2002. The TMSF ultimately came under the jurisdiction of the president's office in 2018.²⁷

In 2013, the TMSF seized BMC from a pro-secular Turkish businessman for failing to make payments on debt.²⁸ In May 2014, Ethem Sancak, a businessman who provided political and financial support to Erdogan, bought BMC from TMSF for \$360 million, a 20 percent discount.²⁹ Between 2013 and 2017, Sancak funded a wide range of pro-government media outlets.³⁰ In 2017, he joined the AKP's Central Executive Committee.³¹ Sancak also benefited when a distant relative of Erdogan invested \$100 million in BMC.³²

In 2014, Erdogan helped Qatar broker a \$300 million deal to acquire a 49.9 percent stake in BMC.³³ The following year, Turkish media divulged that this deal allowed a Qatari military attaché serving in Ankara to breach the Vienna Convention on Diplomatic Relations by joining the BMC board, which is privy to sensitive data about classified Turkish government tenders.

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26. Burak E. Bekdil, "Turkey's Erdogan Decrees Sweeping Defense Procurement Takeover," *Defense News*, December 27, 2017. (<https://www.defensenews.com/industry/2017/12/27/turkeys-erdogan-decrees-sweeping-defense-procurement-takeover>)

27. Berrak Kanbir and Rodriguez Sanmartin, "24 Haziran'dan sonra Cumhurbaşkanlığı'na bağlanan kurumlar [Institutions Tied to the Presidency Following June 24]," *Euronews* (France), July 25, 2018. (<https://tr.euronews.com/2018/07/25/24-haziran-dan-sonra-cumhurbaskanligina-baglanan-kurumlar-neler->)

28. "Turkish Deposit Insurer Takes Over Two Cukurova Ventures," *Anadolu Agency* (Turkey), May 17, 2013. (<https://www.aa.com.tr/en/economy/turkish-deposit-insurer-takes-over-two-cukurova-ventures/245267>)

29. "Military Vehicle Manufacturer BMC's Sale to Businessman Ethem Sancak Approved," *Hurriyet Daily News* (Turkey), May 21, 2014. (<https://www.hurriyetdailynews.com/military-vehicle-manufacturer-bmcs-sale-to-businessman-ethem-sancak-approved-66774>)

30. Cüneyt Toros, "Çukurova, Turkmedya'yı Ethem Sancak'a Sattı [Cukurova Sells Turkmedya to Ethem Sancak]," *The Wall Street Journal*, November 21, 2013. (<https://www.wsj.com/articles/BL-247B-658>); "ES Medya'nın Yeni Sahibi Hasan Yeşildağ Kimdir? [Who is ES Media's New Owner Hasan Yesildag?]," *Bianet* (Turkey), August 17, 2017. (<https://m.bianet.org/bianet/medya/189200-es-medya-nin-yeni-sahibi-hasan-yesildag-kimdir>)

31. "Erdogan Renews AKP's A-Team With Greater Youth Presence," *Hurriyet Daily News* (Turkey), May 21, 2017. (<https://www.hurriyetdailynews.com/erdogan-renews-akps-a-team-with-greater-youth-presence-113357>)

32. Burak E. Bekdil, "How a Small Investment is Set to Earn a Turkish Businessman \$4.4B from Tank Sales," *Defense News*, December 19, 2019. (<https://www.defensenews.com/industry/2019/12/19/how-a-small-investment-is-set-to-earn-a-turkish-businessman-44b-from-tank-sales>)

33. Ibid.

It did not end there. Erdogan signed a decree in 2018 leasing Turkey's national Tank and Pallet Factory to BMC for 25 years and granted BMC an exemption from customs duties, value added taxes, and most corporate taxes.³⁴ This was the first time a private company was able to lease a Turkish military facility. BMC also won a €3.5 billion contract to produce the Altay tank.³⁵ This led opposition lawmakers to question whether it was in Turkey's security interests to let a Qatari-backed firm participate in a major Turkish defense project.³⁶

The Altay tank project has been stalled for years, partly because of Western sanctions and foreign partners' refusal to share engine and transmission technology. BMC reportedly sold a majority of its shares in May 2021 to the Turkish steel producer Tosyali Holding, which reportedly also has close ties to Erdogan.³⁷

In short, over the past decade, the BMC saga has entailed the company's seizure by the Turkish state, the sale of an undervalued BMC to businessmen with close ties to Erdogan, the leasing of a military facility to a private company with heavy Qatari investment, and then a buyout of the struggling company.

BOTTLENECK: ENGINES

The ability to acquire engines is the key bottleneck facing the Turkish defense industry. As Turkey's relationship with the West has declined and Western concerns mount over the use of Turkish weapon systems against civilians in conflicts such as northern Syria and Nagorno-Karabakh, some countries have declined to sell engines or engine components to Ankara.³⁸ Since Turkey cannot yet manufacture military-grade engines domestically, this has left Ankara with two potential courses of action: acquire the necessary inputs from suppliers outside its traditional circle of partners and build up a domestic industry capable of designing and manufacturing engines. Turkey is pursuing both options across an array of systems.

Imports from alternative suppliers are serving as a stopgap measure so that domestic manufacturers have time to enhance their engine building capability. Whether domestic producers will ever reach this goal remains an open question given the inefficiency and corruption in the defense sector. What's more, Turkey has already encountered a variety of challenges when trying to acquire engines for its drones, jets, helicopters, tanks, and other armored vehicles.

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34. Metin Gurcan, "Privatization of Turkish Military Factory Draws Strong Criticism," *Al-Monitor*, January 14, 2019. (<https://www.al-monitor.com/originals/2019/01/turkey-privatization-military-factory-draws-criticism.html>)

35. *Grand National Assembly of Turkey*, "Press Conference of Akbasoglu, AK Party Group Vice Chairman," December 16, 2020. (https://meclishaber.tbmm.gov.tr/develop/owa/haber_portal.aciklama?p1=150033)

36. Metin Gurcan, "Opposition turns up pressure on Erdogan over defense dealings with Qatar," *Al-Monitor*, December 8, 2020. (<https://www.al-monitor.com/originals/2020/12/turkey-qatar-locally-produced-tank-project-brink-of-collapse.html>)

37. Burak E. Bekdil, "BMC in Talks to Sell Turkish Shares to Local Steelmaker," *Defense News*, May 11, 2021. (<https://www.defensenews.com/global/2021/05/11/bmc-in-talks-to-sell-turkish-shares-to-local-steelmaker>); "BMC Shares Changed Hands: Tosyali Holding Officially Owns 50,1 Percent," *Railly News* (Turkey), June 6, 2021. (<https://www.raillynews.com/2021/06/bmc-shares-changed-hands%2C-501-percent-officially-belongs-to-tosyal%C4%B1-holding>)

38. Julian Borger, "Kurds call on US to block Turkish military drones from Syrian air space," *The Guardian* (UK), October 31, 2019. (<https://www.theguardian.com/world/2019/oct/31/kurds-turkish-military-drones-syrian-air-space-us>); Max Bearak, Meg Kelly, and Joyce Sohyun Lee, "How Ethiopia used a Turkish drone in a strike that killed nearly 60 civilians," *The Washington Post*, February 7, 2022. (<https://www.washingtonpost.com/world/interactive/2022/ethiopia-tigray-dedebit-drone-strike>)

Table 2: Turkish Drones and Engine Models

Name of Drone	Engine Manufacturer/ Model	Country of Origin (Engine)	Notes
Bayraktar TB-2	<ul style="list-style-type: none"> Rotax³⁹ (until October 2020) Claims of joint production with Ukrspetsexport using Ukrainian engines⁴⁰ 	Austria/Canada	Due to its record of success in combat, the TB-2 is now one of the most sought-after weapons systems in the world. Its components are subject to export restrictions due to its use in conflicts.
Bayraktar Akinci	<ul style="list-style-type: none"> TUSAS Engine Industries (TEI)⁴¹ TEI-PD170 turbodiesel aviation engine (as of 2018)⁴² 	Turkey	As of October 2020, ⁴³ TEI began producing a new domestic engine for both the Akinci and TB-3, though exact details are scarce. ⁴⁴
Anka Aksungur	<ul style="list-style-type: none"> TEI⁴⁵ Two twin-turbodiesel PD-170⁴⁶ 	Turkey	
Karayel	<ul style="list-style-type: none"> Vestel Savunma Intra Defense Technologies and Advanced Electronics Company 97 hp air cooled 4-cylinder engine 	Turkey/Saudi Arabia	Engine production location is unclear; ⁴⁷ however, given that Turkey previously produced the Karayel without Saudi assistance, Turkey is likely the engine manufacturer.
Bayraktar TB-3 (under development) ⁴⁸	<ul style="list-style-type: none"> TEI⁴⁹ 	Turkey	Follow-up to successful TB-2 model
Bayraktar MIUS (under development) ⁵⁰	<ul style="list-style-type: none"> Ivchenko-Progress⁵¹ 	Ukraine	MIUS uses a dual engine system for its AI-25TLT and AI-322F engine variants. ⁵² MIUS will likely be used in conjunction with Turkey's planned light aircraft carrier TCG Anadolu. ⁵³

39. Canada stopped the exportation of Rotax engines to Turkey in October 2020.

40. Inder Singh Bisht, "Ukraine Forming Joint Venture with Turkey to Produce 48 Bayraktar TB2 Drones," *The Defense Post*, November 25, 2020. (<https://www.thedefensepost.com/2020/11/25/ukraine-turkey-venture-bayraktar-tb2-drones>)

41. "Local Engines to Power Turkey's Cutting-Edge Combat Drones," *Daily Sabah* (Turkey), October 30, 2020. (<https://www.dailysabah.com/business/defense/local-engines-to-power-turkeys-cutting-edge-combat-drones>)

42. Ibrahim Sunnetci, "TEI-PD170 Turbo Diesel Aviation Engine Serial Production Delivery Ceremony," *Defence Turkey* (Turkey), 2019. (<https://www.defenceturkey.com/en/content/tei-pd170-turbo-diesel-aviation-engine-serial-production-delivery-ceremony-3833>)

43. "Turkish-Made Engine to Power Country's UAVs." *Hurriyet Daily News* (Turkey), October 30, 2020. (<https://www.hurriyetdailynews.com/turkish-made-engine-to-power-countrys-uavs-159579>)

44. "TEI-PD170 Turbodiesel Aviation Engine," *TUSAS Engine Industries Inc.*, accessed March 4, 2022. (<https://www.tei.com.tr/en/products/tei-pd170>)

45. "Aksungur UAV," *Global Security*, accessed March 4, 2022. (<https://www.globalsecurity.org/military/world/europe/aksungur.htm>)

46. Kelvin Wong, "Turkey Advances Anka-Aksungur MALE UAV Development," *Janes* (UK), April 18, 2019. (<https://www.janes.com/defence-news/news-detail/turkey-advances-anka-aksungur-male-uav-development>)

47. Burak E. Bekdil, "Two Saudi Companies to Produce Turkish Drones," *Defense News*, March 23, 2021. (<https://www.defensenews.com/unmanned/2021/03/22/two-saudi-companies-to-produce-turkish-drones>)

48. "Local Engines to Power Turkey's Cutting-Edge Combat Drones," *Daily Sabah* (Turkey), October 30, 2020. (<https://www.dailysabah.com/business/defense/local-engines-to-power-turkeys-cutting-edge-combat-drones>)

49. Ibid.

50. Cem D. Yaylali, "Baykar Makina Unveils MIUS UCAV Concept," *Janes* (UK), July 26, 2021. (<https://www.janes.com/defence-news/news-detail/baykar-makina-unveils-mius-ucav-concept>)

51. "Turkey's Baykar, Ukrainian Firm Ink Deal for Unmanned Aircraft Engine," *Daily Sabah* (Turkey), November 12, 2021. (<https://www.dailysabah.com/business/defense/turkeys-baykar-ukrainian-firm-ink-deal-for-unmanned-aircraft-engine>)

52. @AceJaceu, "In a presentation made by @Baykar_Savunma in Ukraine, it has been revealed that there will be 2 different turbofan engines which will power the MIUS UCAV. MIUS A 'AI-25TL' (thrust approximately 17 kN) MIUS B 'AI-322F' (thrust approximately 41 kN)," *Twitter*, August 13, 2021. (<https://twitter.com/acejaceu/status/1426200196283879427>)

53. "Turkey's Defense Industry Rolls Up Sleeves for Aircraft Carrier," *Daily Sabah* (Turkey), November 23, 2021. (<https://www.dailysabah.com/business/defense/turkeys-defense-industry-rolls-up-sleeves-for-aircraft-carrier>)

DRONE ENGINES

Turkey's TB-2 drone is one of the most in-demand items on the international arms market, particularly after its successes in the Nagorno-Karabakh conflict as well as the Syrian and Libyan civil wars. It is a medium-altitude, long-endurance armed drone with a proven combat record. Albania,⁵⁴ Azerbaijan,⁵⁵ Ethiopia,⁵⁶ Kyrgyzstan,⁵⁷ Libya,⁵⁸ Morocco,⁵⁹ Niger,⁶⁰ Pakistan,⁶¹ Poland,⁶² Qatar,⁶³ Tunisia,⁶⁴ Turkmenistan,⁶⁵ and Ukraine⁶⁶ have signed deals to purchase the TB-2, and dozens of other countries have expressed interest.⁶⁷

However, the TB-2 and other Turkish drones depend on a global supply chain that other countries have disrupted. In 2020, Canada suspended⁶⁸ the exportation of sensors⁶⁹ for the TB-2, and Rotax — the Austrian subsidiary of Bombardier Recreational Products, a Canadian company — stopped exporting aircraft engines that same year.⁷⁰

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54. "Albania is set to purchase Turkish armed drones," *TRT World* (Turkey), July 2, 2021. (<https://www.trtworld.com/magazine/albania-is-set-to-purchase-turkish-armed-drones-48028>)

55. Burak E. Bekdil, "Azerbaijan to buy armed drones from Turkey," *Defense News*, June 25, 2020. (<https://www.defensenews.com/unmanned/2020/06/25/azerbaijan-to-buy-armed-drones-from-turkey>)

56. Orhan Coskun, Jonathan Spicer, and Ece Toksabay, "Turkey Expands Armed Drone Sales to Ethiopia and Morocco," *Reuters*, October 14, 2021. (<https://www.reuters.com/world/middle-east/turkey-expands-armed-drone-sales-ethiopia-morocco-sources-2021-10-14>)

57. Nazir Aliyev Tayfur, "Kyrgyzstan receives Turkish armed drones," *Anadolu Agency* (Turkey), December 18, 2021. (<https://www.aa.com.tr/en/world/kyrgyzstan-receives-turkish-armed-drones/2451319>)

58. Oben Mumcuoglu and Tommy Lund, "Factbox: Turkey's Bayraktar TB2 combat drones sales," *Reuters*, November 10, 2021. (<https://www.reuters.com/world/middle-east/turkeys-bayraktar-tb2-combat-drones-sales-2021-11-10>)

59. Orhan Coskun, Jonathan Spicer, and Ece Toksabay, "Turkey Expands Armed Drone Sales to Ethiopia and Morocco," *Reuters*, October 14, 2021. (<https://www.reuters.com/world/middle-east/turkey-expands-armed-drone-sales-ethiopia-morocco-sources-2021-10-14>)

60. Stijn Mitzer and Joost Oliemans, "Taking Africa by Storm: Niger Acquires the Bayraktar TB2," *Oryx*, November 30, 2021. (<https://www.oryxspioenkop.com/2021/11/taking-africa-by-storm-niger-acquires.html>)

61. "Pakistan Operationalises Bayraktar TB-2 MALEUCAV for PAF," *Current Affairs* (Pakistan), January 10, 2022. (<https://www.currentaffairs.com.pk/pakistan-operationalises-bayraktar-tb-2-male-ucav-for-paf>)

62. Alicja Ptak and Ali Kucukgocmen, "Poland to Become First NATO Country to Buy Turkish Drones," *Reuters*, May 22, 2021. (<https://www.reuters.com/world/europe/poland-become-first-nato-country-buy-turkish-drones-2021-05-22>)

63. Oben Mumcuoglu and Tommy Lund, "Factbox: Turkey's Bayraktar TB2 combat drones sales," *Reuters*, November 10, 2021. (<https://www.reuters.com/world/middle-east/turkeys-bayraktar-tb2-combat-drones-sales-2021-11-10>)

64. Yusuf Selman Inanc, "Turkey and its Drones in Africa - A Switch to Hard Power?" *Middle East Eye* (UK), October 21, 2021. (<https://www.middleeasteye.net/news/turkey-africa-drones-switch-hard-power>)

65. Gareth Jenkins, "Turkmenistan confirmed as Bayraktar TB2 UAS customer," *Janes* (UK), October 4, 2021. (<https://www.janes.com/defence-news/news-detail/turkmenistan-confirmed-as-bayraktar-tb2-uas-customer>)

66. Amberin Zaman, "Turkish drones boost Ukrainian spirits amid fears of Russian invasion," *Al-Monitor*, January 27, 2022. (<https://www.al-monitor.com/originals/2022/01/turkish-drones-boost-ukrainian-spirits-amid-fears-russian-invasion>)

67. Oben Mumcuoglu and Tommy Lund, "Factbox: Turkey's Bayraktar TB2 combat drones sales," *Reuters*, November 10, 2021. (<https://www.reuters.com/world/middle-east/turkeys-bayraktar-tb2-combat-drones-sales-2021-11-10>)

68. Burak E. Bekdil, "Canadian Block on Drone Parts Shows Turkey's Defense Industry Still Not Independent," *Defense News*, October 13, 2020. (<https://www.defensenews.com/global/europe/2020/10/13/canadian-block-on-drone-parts-shows-turkeys-defense-industry-still-not-independent>)

69. Burak E. Bekdil, "How Turkey Bypasses Western Arms Embargoes," *Begin-Sadat Center for Strategic Studies*, June 29, 2021. (<https://besacenter.org/turkey-arms-embargoes>)

70. "Canadian Company Stops Supplying Aircraft Engines to Turkey over Nagorno-Karabakh Conflict," *Duvar English* (Turkey), October 26, 2020. (<https://www.duvarenglish.com/economy/2020/10/26/canadian-company-stops-supplying-aircraft-engines-to-turkey-over-nagorno-karabakh-conflict>)

U.S. companies have come under congressional⁷¹ and public⁷² pressure to stop supplying parts. This is a conundrum for Turkey, as it does not have the capability to domestically manufacture a replacement.

Rotax stopped⁷³ the sale of TB-2 engines in October 2020 following the Nagorno-Karabakh conflict, saying that they were intended and certified only for civilian use.⁷⁴ In other words, Turkey was using foreign, off-the-shelf, non-military engines to produce the drones. Turkey continued to export the TB-2⁷⁵ throughout 2021.⁷⁶ It is unclear whether Ankara found a new engine or if it continued to use stockpiled Rotax engines.

There are several countries that may be interested in helping Turkey produce or procure replacement engines for the TB-2. Saudi Arabia is co-producing⁷⁷ the Karayel-SU drone, which was designed by Turkey-based Vestel Defence Industry, and may be interested⁷⁸ in other Turkish drones. Indonesia has shown an interest in working with Turkish Aerospace Industries.⁷⁹

Ukraine is the most promising partner for Turkey with regard to engine technology, due to its industrial prowess and aspiration to acquire drones for its conflict with Russia. Ukrainian Deputy Prime Minister Oleh Urusky said in August 2020 that two Ukrainian companies, Ivchenko-Progress and Motor Sich, would hold talks with Turkish defense companies.⁸⁰ The TB-2's producer, Baykar, signed engine deals with these two companies in November 2021.⁸¹

In 2020, Ukrspetsexport, a state-owned Ukrainian defense manufacturer, announced a joint-venture to produce TB-2s in Ukraine.⁸² Baykar officials claimed that a replacement engine would be ready by the end of 2021.⁸³ Motor Sich,

71. "Congress Presses State Department on Turkey's Drone Program," *Kathimerini English* (Greece), November 8, 2021. (<https://www.ekathimerini.com/news/1166071/congress-presses-state-department-on-turkey-s-drone-program>)

72. Vahe Sarukhanyan, "The Killing Business: Israeli 'Kamikaze' Drones Used by Azerbaijan Utilized French and Swiss Technologies," *Hetq* (Armenia), December 3, 2020. (<https://hetq.am/en/article/124955>)

73. Levon Sevunts, "Bombardier Recreational Products Suspends Delivery of Aircraft Engines Used on Military Drones" *CBC News* (Canada), October 25, 2020. (<https://www.cbc.ca/news/politics/turkey-armenia-azerbaijan-drones-bombardier-1.5775350>)

74. Vahe Sarukhanyan, "The Killing Business: Israeli 'Kamikaze' Drones Used by Azerbaijan Utilized French and Swiss Technologies," *Hetq* (Armenia), December 3, 2020. (<https://hetq.am/en/article/124955>)

75. Inder Singh Bisht, "Morocco to Receive 13 Bayraktar TB2 Combat Drones From Turkey," *The Defense Post*, April 20, 2021. (<https://www.thedefensepost.com/2021/04/20/morocco-buys-turkish-bayraktar-drones>)

76. Ragip Soyly, "Iraq Closes In On Drones, Helicopters and EW from Turkey," *Breaking Defense*, August 30, 2021. (<https://breakingdefense.com/2021/08/iraq-closes-in-on-drones-helicopters-and-ew-from-turkey>)

77. Burak E. Bekdil, "Two Saudi Companies to Produce Turkish Drones," *Defense News*, March 23, 2021. (<https://www.defensenews.com/unmanned/2021/03/22/two-saudi-companies-to-produce-turkish-drones>)

78. Paul Iddon, "Why Would Saudi Arabia Be Interested in Acquiring Turkish Drones?" *Ahval* (UK), April 2, 2021. (<https://ahvalnews.com/turkish-drones/why-would-saudi-arabia-be-interested-acquiring-turkish-drones>)

79. Prashanth Parameswaran, "Indonesia-Turkey Military Cooperation in the Spotlight," *The Diplomat*, August 18, 2018. (<https://thediplomat.com/2018/08/indonesia-turkey-military-cooperation-in-the-spotlight>)

80. Burak E. Bekdil, "Ukraine and Turkey in Talks to Bolster Industrial Cooperation," *Defense News*, September 2, 2020. (<https://www.defensenews.com/industry/2020/09/02/ukraine-and-turkey-in-talks-to-bolster-industrial-cooperation>)

81. "Turkey's Baykar, Ukrainian Firm Ink Deal For Unmanned Aircraft Engine," *Daily Sabah* (Turkey), November 12, 2021. (<https://www.dailysabah.com/business/defense/turkeys-baykar-ukrainian-firm-ink-deal-for-unmanned-aircraft-engine>)

82. Inder Singh Bisht, "Ukraine Forming Joint Venture with Turkey to Produce 48 Bayraktar TB2 Drones," *The Defense Post*, November 25, 2020. (<https://www.thedefensepost.com/2020/11/25/ukraine-turkey-venture-bayraktar-tb2-drones>)

83. James Marson and Brett Forrest, "Armed Low-Cost Drones, Made by Turkey, Reshape Battlefields and Geopolitics," *The Wall Street Journal*, June 3, 2021. (<https://www.wsj.com/articles/armed-low-cost-drones-made-by-turkey-reshape-battlefields-and-geopolitics-11622727370>)

already a partner for production of Turkish drones engines,⁸⁴ including for the TB-2, won a contract in November 2021 to supply parts for 30 AI-450T engines in Turkey's Akinci strike drones.⁸⁵ The next month, Baykar acquired land in Ukraine to build a factory.⁸⁶ Around that time, Andriy Yermak, head of the Ukrainian president's office, stated that production of TB-2s was taking place inside of Ukraine, and that the engines were manufactured in Ukraine.⁸⁷ Ukraine bought six TB-2s in 2019 and six more in July 2021 for a total of 12, and plans to acquire 24 more through 2022.⁸⁸

In January of this year, a spokesperson for the Ukrainian Air Force claimed that Kyiv has "approximately 20 Bayraktar drones, but we will not stop there."⁸⁹ There are other defense cooperation deals looming between Turkey and Ukraine.

1. Ukraine offered Turkey to assess co-production for Antonov's AN-178 cargo aircraft.⁹⁰
2. Turkish government media say Ukraine may sell a 50 percent stake in Motor Sich to a Turkish state-owned company.⁹¹
3. Ukraine and Turkey signed an agreement to cooperate on the development of TF-X fighter jet engines.⁹²
4. Turkey will use Ukrainian engines for its heavy class helicopters, the ATAK 2.⁹³
5. Ukrainian officials said in 2020 that aircraft manufacturer Antonov hopes to enhance its partnership with Turkey's state-controlled missile manufacturer Roketsan.⁹⁴

84. "Ukraine May Sell 50% Stake in Motor Sich to Turkish Firm: Report," *Daily Sabah* (Turkey), April 13, 2021. (<https://www.dailysabah.com/business/defense/ukraine-may-sell-50-stake-in-motor-sich-to-turkish-firm-report>)

85. "Ukraine's Motor Sich to Supply Parts for Turkish Aircraft, Drones," *The Tribune*, January 12, 2022. (<https://www.thetribune.com/ukraines-motor-sich-to-supply-parts-for-turkish-aircraft-drones>)

86. Ragip Soylu, "Ukraine deepens defence ties with Turkey amid standoff with Russia," *Middle East Eye* (UK), February 3, 2022. (<https://www.middleeasteye.net/news/turkey-deepens-defense-ties-ukraine-drone-trade>)

87. Ekaterina Shumilo, "Правила боя. Андрей Ермак о переговорах с Россией, планах по Донбассу и личной борьбе [Fight rules. Andriy Yermak on negotiations with Russia, plans for Donbas and personal struggle]," *Focus* (Ukraine), December 24, 2021. (<https://focus.ua/politics/501541-andrey-ermak-o-peregovorah-s-rossiey-planah-po-donbassu-i-lichnoy-borbe>)

88. Burak E. Bekdil, "Ukraine and Turkey in Talks to Bolster Industrial Cooperation," *Defense News*, September 2, 2020. (<https://www.defensenews.com/industry/2020/09/02/ukraine-and-turkey-in-talks-to-bolster-industrial-cooperation>); "Ukraine received UAVs bought from Turkey, President Poroshenko says," *Daily Sabah* (Turkey), March 7, 2019. (<https://www.dailysabah.com/defense/2019/03/07/ukraine-received-uavs-bought-from-turkey-president-poroshenko-says>); Talha Yavuz, "Ukraine Plans to Purchase 24 More Turkish Drones," *Anadolu Agency* (Turkey), September 13, 2021. (<https://www.aa.com.tr/en/world/ukraine-plans-to-purchase-24-more-turkish-drones/2362975>); Burak E. Bekdil, "Ukraine is Set to Buy 24 Turkish Drones. So Why Hasn't Russia Pushed Back?" *Defense News*, September 29, 2021. (<https://www.defensenews.com/unmanned/2021/09/29/ukraine-is-set-to-buy-24-turkish-drones-so-why-hasnt-russia-pushed-back>)

89. Amberin Zaman, "Turkish drones boost Ukrainian spirits amid fears of Russian invasion," *Al-Monitor*, January 27, 2022. (<https://www.al-monitor.com/originals/2022/01/turkish-drones-boost-ukrainian-spirits-amid-fears-russian-invasion>)

90. "Ukraine Offers An-178 Co-Production to Turkey," *Defense Aerospace* (France), accessed March 4, 2022. (https://www.defense-aerospace.com/articles-view/release/3/213203/ukraine-offers-an_178-co_production-to-turkey.html)

91. "Ukraine May Sell 50% Stake in Motor Sich to Turkish Firm: Report," *Daily Sabah* (Turkey), April 13, 2021. (<https://www.dailysabah.com/business/defense/ukraine-may-sell-50-stake-in-motor-sich-to-turkish-firm-report>)

92. Metin Gurcan, "Turkey on Course to Strategic Partnership with Ukraine," *Al-Monitor*, October 21, 2021. (<https://www.al-monitor.com/originals/2020/10/turkey-russia-increasing-defense-cooperation-ankara-kiev.html>)

93. "Turkish Aerospace Buys Ukrainian Engines for Atak," *Shephard Media*, July 6, 2021. (<https://www.shephardmedia.com/news/air-warfare/turkish-aerospace-buys-ukrainian-engines-atak>)

94. Burak E. Bekdil, "Ukraine and Turkey in Talks to Bolster Industrial Cooperation," *Defense News*, September 2, 2020. (<https://www.defensenews.com/industry/2020/09/02/ukraine-and-turkey-in-talks-to-bolster-industrial-cooperation>)

The future of these cooperation deals will depend on the outcome of the Ukraine war. While a prolonged and extensive Russian invasion could halt cooperation, Kyiv's effective use of Turkish weaponry could strengthen cooperation with Ankara. Alternatively, if the Kremlin succeeds in installing a puppet regime in Kyiv, the existing Turkish-Russian defense cooperation might extend to cooperation with Ukrainian defense industries under Russian tutelage.

Although many international purchases of the TB-2 result from the drone's battlefield performances, there is also a diplomatic angle. The family of Erdogan's son-in-law, Selcuk Bayraktar, owns the company that produces the TB-2. Some governments see TB-2 orders as a means to curry favor with Erdogan.⁹⁵

This is particularly important for Eastern European states under threat from Russia. Indeed, Erdogan has a history of playing the spoiler within NATO when the alliance seeks to push back against the Kremlin's aggression.⁹⁶ In 2020, for example, the Erdogan government blocked⁹⁷ a NATO defense plan for the Baltic states and Poland for over six months.⁹⁸ TB-2 purchases are not just a way to strengthen their militaries, but also a means to buy Erdogan's goodwill in the hope he will not block a unified NATO response to Russian intimidation.

JET ENGINE — TF-X

Turkey's lack of indigenous engines has stalled its development of its purported fifth-generation fighter jet, the TF-X.⁹⁹ Ankara has turned to numerous suppliers abroad, but to no avail. Notably, Turkey signed a deal with the British company Rolls-Royce to develop an engine,¹⁰⁰ but as the *Financial Times* reported, Rolls-Royce balked in 2019 "due to a dispute over the sharing of intellectual property and the involvement of a Qatari-Turkish company,"¹⁰¹ namely BMC.¹⁰² Turkey has since commissioned TRMotor, which is owned by SSTEK A.S., which itself is owned by Turkey's defense procurement agency, the Presidency of Defense Industries (SSB), to develop an auxiliary power unit and air turbine start system that may eventually be part of an indigenous engine.¹⁰³ Last December, Ismail Demir, who

95. "President Erdoğan's Daughter Sümeyye to Get Engaged to Selçuk Bayraktar, Turkey's First Drone Maker," *Daily Sabah* (Turkey), March 7, 2016. (<https://www.dailysabah.com/politics/2016/03/07/president-erdogans-daughter-sumeyye-to-get-engaged-to-selcuk-bayraktar-turkeys-first-drone-maker>); "Baykar," *Baykar Makina*, accessed March 4, 2022. (<https://www.baykartech.com/en>). Erdogan's son-in-law is the company's chief technology officer.

96. Aykan Erdemir, "Erdogan Saves Putin's Belarusian Ally by Playing Spoiler Role Within NATO," *Foundation for Defense of Democracies*, May 28, 2021. (<https://www.fdd.org/analysis/2021/05/28/erdogan-saves-putins-belarusian-ally>)

97. "Turkey Still Blocking Defense Plans for Poland, Baltics, Say NATO Allies," *Kathimerini English* (Greece), June 17, 2020. (<https://www.ekathimerini.com/news/253780/turkey-still-blocking-defense-plans-for-poland-baltics-say-nato-allies>)

98. "NATO Endorses Baltic Defence Plans after Turkey Withdraws Veto," *Lithuanian Radio and Television* (Lithuania), June 30, 2020. (<https://www.lrt.lt/en/news-in-english/19/1193506/nato-endorses-baltic-defence-plans-after-turkey-withdraws-veto>)

99. David Axe, "Why Turkey's Newest TF-X Stealth Fighter Won't Make It To The Tarmac," *The National Interest*, October 3, 2020. (<https://nationalinterest.org/blog/reboot/why-turkeys-newest-tf-x-stealth-fighter-wont-make-it-tarmac-170094>)

100. Burak E. Bekdil, "Turkey's 'Chronic Engine Problem' Is Harming Defense Projects, Warn Officials," *Defense News*, June 26, 2020. (<https://www.defensenews.com/industry/techwatch/2020/06/26/turkeys-chronic-engine-problem-is-harming-defense-projects-warn-officials>)

101. Laura Pitel and Silvia Pfeifer, "Rolls-Royce Dials Back on Project to Build New Turkish Fighter Jet," *Financial Times* (UK), March 4, 2019. (<https://www.ft.com/content/164c5ee0-3d1d-11e9-8c2f-30761f19a974>)

102. Laura Pitel, Peggy Hollinger, and David Bond, "Turkey and UK battle to save fighter jet project: Sharing of sensitive British technology threatens to wreck deal," *Financial Times* (UK), June 12, 2018. (<https://www.ft.com/content/9b6d7af6-6d6a-11e8-92d3-6c13e5c92914>)

103. Burak E. Bekdil, "Turkey Hopes New Engine Deal Will Power Future TF-X Fighter Jet," *Defense News*, February 16, 2021. (<https://www.defensenews.com/industry/techwatch/2021/02/16/turkey-hopes-new-engine-deal-will-power-future-tf-x-fighter-jet>)

leads the SSB, announced that the TF-X program will initially use General Electric's F110 engine, although General Electric has not confirmed this.¹⁰⁴

Russia has also offered to provide engine technology for the TF-X.¹⁰⁵ Demir said, "We will negotiate with Russia about [TF-X] parts we want to locally produce."¹⁰⁶ However, there are worries in Turkey that deeper defense cooperation with Moscow would inflame tensions with Washington. Ankara's purchase of Russia's S-400 surface-to-air missile system¹⁰⁷ led the Trump administration to impose sanctions against Turkey in 2020 pursuant to Section 231 of the Countering America's Adversaries Through Sanctions Act (CAATSA), which targets significant transactions with the Russian defense or intelligence sectors.¹⁰⁸

In October 2020, Ukraine and Turkey signed an agreement enabling cooperation on the development of jet engines.¹⁰⁹ Despite the lack of progress, Turkish officials remain optimistic that Ankara will be able to produce jet engines indigenously for their advanced fighters by 2029.¹¹⁰

HELICOPTER ENGINES

Currently, Turkey imports engines from LHTEC, a joint venture between Rolls-Royce and the U.S.-based Honeywell, to power its T129 ATAK helicopter. Ankara developed the T129 in partnership with Anglo-Italian AgustaWestland and based the helicopter on the Italian Agusta A129 Mangusta platform.

Turkey recently sold six T129s to the Philippines with U.S. approval.¹¹¹ However, as a result of Washington's political differences with both Ankara and Islamabad, the United States did not grant Turkey a license to export the same engines to Pakistan.¹¹² On January 5, Pakistan announced it was cancelling its T129 deal with Turkey, opting

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104. Burak E. Bekdil, "Could Turkey's future TF-X jet include a mix of American and Russian tech?" *Defense News*, December 8, 2021. (<https://www.defensenews.com/air/2021/12/08/could-turkeys-future-tf-x-jet-include-a-mix-of-american-and-russian-tech>)

105. "Russia Offers Turkey Fifth Gen Jet Engine, Talks Advance on Additional S-400 Systems," *Defense World*, June 2, 2020. (https://www.defenseworld.net/news/27113/Russia_Offers_Turkey_Fifth_Gen_Jet_Engine_Talks_Advance_on_Additional_S_400_Systems#.YL5f1vKiU)

106. Burak E. Bekdil, "Could Turkey's future TF-X jet include a mix of American and Russian tech?" *Defense News*, December 8, 2021. (<https://www.defensenews.com/air/2021/12/08/could-turkeys-future-tf-x-jet-include-a-mix-of-american-and-russian-tech>)

107. Bradley Bowman, Aykan Erdemir, and Ryan Brobst, "U.S. Security Partners and Putin's S-400," *Foundation for Defense of Democracies*, April 29, 2021. (<https://www.fdd.org/analysis/2021/04/29/us-security-partners-and-putins-s-400>)

108. Bradley Bowman and Aykan Erdemir, "CAATSA Sanctions Should Be Just First Step if Erdogan Does Not Change Course," *Foundation for Defense of Democracies*, December 16, 2020. (<https://www.fdd.org/analysis/2020/12/16/caatsa-sanctions-should-be-just-first-step>)

109. Metin Gurcan, "Turkey on Course to Strategic Partnership with Ukraine," *Al-Monitor*, October 21, 2020. (<https://www.al-monitor.com/originals/2020/10/turkey-russia-increasing-defense-cooperation-ankara-kiev.html>)

110. "Homegrown fighter jet to fly with domestic engine by 2029," *Daily Sabah* (Turkey), January 10, 2020. (<https://www.dailysabah.com/defense/2020/01/10/homegrown-fighter-jet-to-fly-with-domestic-engine-by-2029>)

111. Ragip Soylu, "US Approves Turkey Military Helicopter Sale to Philippines," *Middle East Eye* (UK), May 17, 2021. (<https://www.middleeasteye.net/news/us-approves-export-licence-t129-helicopter-turkey-philippines>)

112. Burak E. Bekdil, "Turkey to Export T129 Helos to Philippines despite Block on Pakistani Order," *Defense News*, May 26, 2021. (<https://www.defensenews.com/air/2021/05/25/turkey-to-export-t129-helos-to-philippines-despite-block-on-pakistani-order>)

instead to pursue the Chinese-built Z-10ME.¹¹³ It is not certain whether Washington would grant Turkey a license if Iraq moves forward with its reported interest in purchasing 12 of the T129s.¹¹⁴

Additionally, Turkey has been developing and testing domestic helicopter engines produced by the country's TUSAS Engine Industries (TEI),¹¹⁵ which the country's ministry of industry and technology projected could save an estimated \$60 million in import costs.¹¹⁶ The TEI engine was designed for Turkey's first indigenous multipurpose helicopter, the Gokbey, which Ankara intends to export as well.¹¹⁷ Ankara has also turned to Ukraine to help produce engines for its heavy class helicopter, the ATAK 2.¹¹⁸

ALTAY MAIN BATTLE TANK ENGINE

Germany restricted arms exports to Turkey in October 2019 following Erdogan's military incursion into northeastern Syria to target Washington's Syrian Kurdish-led partners in the fight against the Islamic State.¹¹⁹ Since that time, Ankara has struggled to find an engine for the Altay. The Altay prototype was powered by a 1,500-horsepower diesel engine from Germany's MTU Friedrichshafen.¹²⁰ German defense company Rheinmetall had established a joint venture with Turkey's BMC to produce engines for the Altay, but as early as 2017, Rheinmetall ran into trouble receiving clearance from German authorities, which cited concerns about Turkey's democratic backsliding and human rights record.¹²¹ BMC is now trying to negotiate with other foreign manufacturers. As of March 2021, BMC had reached an agreement¹²² with South Korean companies that would supply engines for the Altay and help integrate the technology.¹²³

At the same time, BMC has been developing its own domestically produced engine, the BATU, for the Altay.¹²⁴ The initial models will still use the engines and transmission supplied by the South Korean companies Doosan and S&T

113. Kerry Herschelman, "Pakistan cancels attack helicopter project with Turkey, opting for China," *Janes* (UK), January 6, 2022. (<https://www.janes.com/defence-news/news-detail/pakistan-cancels-attack-helicopter-project-with-turkey-opting-for-china>)

114. Aaron Mehta, "Iraq Closes In On Drones, Helicopters And EW From Turkey," *Breaking Defense*, August 30, 2021. (<https://breakingdefense.com/2021/08/iraq-closes-in-on-drones-helicopters-and-ew-from-turkey>)

115. "Turkey's TEI Ignites 2nd Prototype of Domestic Helicopter Engine," *Daily Sabah* (Turkey), January 12, 2021. (<https://www.dailysabah.com/business/defense/turkeys-tei-ignites-2nd-prototype-of-domestic-helicopter-engine>)

116. "Turkey to Save \$60 Million Annually by Producing Homegrown Chopper Engines," *TRT World* (Turkey), December 7, 2020. (<https://www.trtworld.com/magazine/turkey-to-save-60-million-annually-by-producing-homegrown-chopper-engines-42133>)

117. Burak E. Bekdil, "Turkey to Test First Indigenous Helicopter Engine," *Defense News*, December 14, 2020, (<https://www.defensenews.com/industry/techwatch/2020/12/14/turkey-to-test-first-indigenous-helicopter-engine>)

118. "Turkey to Use Ukrainian Engine in Its Heavy Class Attack Helicopters," *Daily Sabah* (Turkey), March 15, 2021. (<https://www.dailysabah.com/business/defense/turkey-to-use-ukrainian-engine-in-its-heavy-class-attack-helicopters>)

119. "German government bans weapons exports to Turkey," *Deutsche Welle* (Germany), October 12, 2019. (<https://www.dw.com/en/german-government-bans-weapons-exports-to-turkey/a-50807998>)

120. "Turkey in Talks with Supplier Abroad for Altay Tank Engine," *Daily Sabah* (Turkey), March 3, 2021. (<https://www.dailysabah.com/business/defense/turkey-in-talks-with-supplier-abroad-for-altay-tank-engine>)

121. Burak E. Bekdil, "BMC in Talks to Sell Turkish Shares to Local Steelmaker," *Defense News*, May 11, 2021. (<https://www.defensenews.com/global/2021/05/11/bmc-in-talks-to-sell-turkish-shares-to-local-steelmaker>); "Rheinmetall fails to get clearance for Turkey export contracts," *Reuters*, March 23, 2017. (<https://www.reuters.com/article/us-rheinmetall-turkey/rheinmetall-fails-to-get-clearance-for-turkey-export-contracts-idUSKBN16U1LI>)

122. Burak E. Bekdil, "At Long Last, Turkey's Altay Tank Finds an Engine from South Korea," *Defense News*, March 8, 2021. (<https://www.defensenews.com/industry/techwatch/2021/03/08/at-long-last-turkeys-altay-tank-finds-an-engine-from-south-korea>)

123. "Turkey in Talks with S Korean Firms for MBT Altay's Engine: Report," *Daily Sabah* (Turkey), March 10, 2021. (<https://www.dailysabah.com/business/defense/turkey-in-talks-with-s-korean-firms-for-mbt-altays-engine-report>)

124. "Turkey to Test Indigenous Engine for Main Battle Tank Altay in April," *Daily Sabah* (Turkey), March 29, 2021. (<https://www.dailysabah.com/business/defense/turkey-to-test-indigenous-engine-for-main-battle-tank-altay-in-april>)

Dynamics, but the next generation will integrate the domestically produced engines. Ankara's choice of Doosan and S&T Dynamics, both of which use German components, is an attempt to circumvent German restrictions. Korean companies are expected to "de-Germanize" components in the engines and then send them on to Turkey.¹²⁵

According to BMC, the tests for the BATU engines have been successful thus far, which could accelerate their integration into the Altay. However, Turkey habitually announces successful developments that never materialize.¹²⁶ Since the announcement, the two Erdogan loyalists who owned 50.1 percent of BMC sold their shares to Tosyali Holding, a Turkish iron and steel manufacturer that also has close ties to Erdogan.¹²⁷

OTHER ARMORED VEHICLE ENGINES

Over the last five years, 66 percent of Turkey's arms exports were armored vehicles, specifically armored personnel carrier-type vehicles. Most of the engines for these vehicles hail from the American companies Cummins and Caterpillar, with a handful of German companies also represented. These sales do not always appear in SIPRI databases as arms sales, because they are commercial, off-the-shelf engines that can be used for other purposes, like construction.

Table 3: Turkish Armored Vehicle Exports, 2016-2020

Name of Armored Vehicle	Engine Manufacturer/ Model	Country of Origin (Engine)	Notes
T-300 Self-propelled MRL (TRG-300 Tiger)	<ul style="list-style-type: none"> ● MAN ● Diesel engine¹²⁸ 	Germany	The Modified Chinese MRL ¹²⁹ merged with German MAN Diesel cross-country truck chassis.
Cobra APV	<ul style="list-style-type: none"> ● GM, V8 Diesel ● Water cooled turbocharged 6.5L 190HP¹³⁰ 	United States	The updated Cobra is being developed in conjunction with American AM General ¹³¹ and Turkey's Otokar.

125. Burak E. Bekdil, "At Long Last, Turkey's Altay Tank Finds an Engine from South Korea," *Defense News*, March 8, 2021. (<https://www.defensenews.com/industry/techwatch/2021/03/08/at-long-last-turkeys-altay-tank-finds-an-engine-from-south-korea>)

126. Metin Gurcan, "Is Turkey Being Snowed by Flurry of Fake Defense News?" *Al-Monitor*, February 6, 2017. (<https://www.al-monitor.com/originals/2017/02/turkey-media-favorite-fake-news-national-defense-industry.html>)

127. Kerry Herschelman, "Turkish majority stake in BMC sold to steelmaker Tosyali Holding," *Janes* (UK), July 2, 2021. (<https://www.janes.com/defence-news/news-detail/turkish-majority-stake-in-bmc-sold-to-steelmaker-tosyali-holding>); Burak E. Bekdil, "BMC in Talks to Sell Turkish Shares to Local Steelmaker," *Defense News*, May 11, 2021. (<https://www.defensenews.com/global/2021/05/11/bmc-in-talks-to-sell-turkish-shares-to-local-steelmaker>)

128. "T-300 Kasirga," *Military Today*, accessed March 4, 2022. (https://www.military-today.com/artillery/t300_kasirga.htm)

129. "Turkey's Kaplan Trg-300 Missile Seen to Get Upgrade," *MilitaryLeak*, May 13, 2021. (<https://militaryleak.com/2021/02/23/turkeys-kaplan-trg-300-missile-seen-to-get-upgrade>)

130. "Otokar Cobra," *Tank Encyclopedia*, accessed March 18, 2022. (<https://www.tanks-encyclopedia.com/modern/Turkey/Otokar-Cobra.php>)

131. "Cobra Wheeled Light Armoured Vehicle, Turkey," *Army Technology*, February 15, 2001. (<https://www.army-technology.com/projects/cobra>)

Ejder Yalcin APV	<ul style="list-style-type: none"> ● Cummins ● 300-375HP diesel engine¹³² 	United States	
Kirpi APC	<ul style="list-style-type: none"> ● Cummins ● ISL9E3+375 turbo diesel engine¹³³ 	United States	
Pars APC 25/30	<ul style="list-style-type: none"> ● Deutz or Caterpillar ● Diesel-fueled engines 600HP¹³⁴ 	Germany or United States	
Yoruk APV	<ul style="list-style-type: none"> ● Unknown 	Unknown	
M-113A300 APC/AIFV APC	<ul style="list-style-type: none"> ● Detroit ● 6V53 two-stroke six-cylinder diesel engine¹³⁵ 	United States	This old platform has been retrofitted multiple times.
Amazon APC	<ul style="list-style-type: none"> ● Cummins ● ISB 360 turbocharged, intercooled diesel engine¹³⁶ 	United States	BMC is working on integrating the Amazon APC with the Songar drone. ¹³⁷
Vuran APC	<ul style="list-style-type: none"> ● Cummins ● ISL turbocharged, intercooled diesel engine¹³⁸ 	United States	The Vuran APC is produced by Turkey's BMC, which uses Cummins engines.
Rabdan IFV	<ul style="list-style-type: none"> ● Caterpillar ● Six-cylinder water cooled diesel engine¹³⁹ 	United States	The Rabdan ¹⁴⁰ is a modified Emirati version of Otokar's Arma APC.
Hizir APC	<ul style="list-style-type: none"> ● Cummins ● ISL turbocharged, intercooled diesel engine¹⁴¹ 	United States	
Arma APC	<ul style="list-style-type: none"> ● Caterpillar ● C9 diesel engine¹⁴² 	United States	

132. "Ejder Yalcin Tactical Armoured Combat Vehicle," *Army Technology*, December 17, 2014. (<https://www.army-technology.com/projects/ejder-yalcin-tactical-armoured-combat-vehicle>)

133. Ibrahim Sunnetci, "A Look at the Turkish Defense Industry Land Platforms/Systems Sector," *Defence Turkey* (Turkey), June 11, 2018, pages 20–21. (<https://www.defenceturkey.com/en/content/a-look-at-the-turkish-defense-industry-land-platforms-systems-sector-3027>)

134. "FNSS Pars (Anatolian Leopard)," *Military Factory*, October 2, 2020. (https://www.militaryfactory.com/armor/detail.php?armor_id=691)

135. "M113 Armoured Personnel Carrier," *Army Technology*, June 29, 2021. (<https://www.army-technology.com/projects/m113-armoured-personnel-carrier>)

136. "Amazon - Technical Specifications," *BMC*, accessed March 18, 2022. (<https://www.bmc.com.tr/en/defense-industry/amazon/technical>)

137. David Hambling, "Turkish Armored Vehicles Get Flying Sniper Drone Wingmen," *Forbes*, May 10, 2021. (<https://www.forbes.com/sites/davidhambling/2021/05/10/turkish-armored-vehicles-get-flying-sniper-wingmen/?sh=7f6ebf5a5d4f>)

138. "Vuran-Technical Specifications," *BMC*, accessed March 18, 2022. (<https://www.bmc.com.tr/en/defense-industry/vuran/technical>)

139. "Rabdan," *Military Today*, 2021. (<http://www.military-today.com/apc/rabdan.htm>)

140. "Vuran-Technical Specifications," *BMC*, accessed March 18, 2022. (<https://www.bmc.com.tr/en/defense-industry/vuran/technical>); "Rabdan," *Military Today*, accessed March 18, 2022. (<http://www.military-today.com/apc/rabdan.htm>)

141. "Hizir," *Katmerciler*, accessed March 4, 2022. (http://www.katmerciler.com/userfiles/file/brosurler/Hizir-4x4_Taktik_Tekerlekli_Zirhli_Arac_%2003-2021.pdf)

142. "Arma 8x8," *Military Today*, accessed March 4, 2022. (https://www.military-today.com/apc/arma_8x8.htm)

EXPORT AND LICENSE RESTRICTIONS

Due to Turkish military aggression abroad, the use of Turkish drones in conflicts with heavy civilian casualties, and Turkey's shift towards Russia, many countries have imposed export and license restrictions on Ankara. These include complete embargoes, partial bans, and restrictions on specific components. The U.S. pause on arms sales, Rotax's decision not to export aircraft engines, Germany's engine restrictions, and Canada's ban on drone optics and targeting systems have been the most difficult for Turkey to manage. Ankara's recent outreach to Armenia, Egypt, Israel, Saudi Arabia, and the United Arab Emirates to normalize relations, as well as its less belligerent foreign policy rhetoric, are part of Ankara's attempt to refurbish its image in the face of transatlantic pressure. Erdogan's tactical moderation shows that coordinated transatlantic action against Ankara in the form of export and license restrictions can be beneficial.

In addition to external pressure from Western governments, there are also growing calls by civil society groups for Ankara to attach humanitarian provisions to its arms sales. Alper Coskun, Turkey's former ambassador to Azerbaijan, urged Ankara to be more transparent in its drone exports and adopt "due diligence measures such as strict adherence to relevant multilateral export control regimes and the formulation of a national code of conduct with principles to guide drone transfer policies."¹⁴³ This follows a 2018 call from a Turkish think tank for Ankara to establish an interdisciplinary center on military and legal ethics, particularly to address the challenges raised by the development of drone technology.¹⁴⁴

Table 4: International Export and License Restrictions on Turkey

Country	Items Embargoed	Reason	Notes
Canada and Austria	Light-weight engine used in Turkish Bayraktar TB-2 drones	Turkish drones used in Nagorno-Karabakh conflict	Pursuant to Canadian Bombardier Recreational Product's (BRP) decision following protests in Canada and Austria. (Rotax is an Austrian subsidiary of Canadian BRP.) ¹⁴⁵
Canada	Overall military goods and technologies	Turkish violation of end-user assurances ¹⁴⁶	Most impacted are camera optics ¹⁴⁷ used in Turkish Bayraktar TB-2 drone.
Czech Republic	Complete arms embargo ¹⁴⁸	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	

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143. Alper Coşkun, "Strengthening Turkish Policy on Drone Exports," *Carnegie Endowment for International Peace*, January 18, 2022. (<https://carnegieendowment.org/2022/01/18/strengthening-turkish-policy-on-drone-exports-pub-86183>)

144. Can Kasapoğlu and Barış Kırdemir, "The Rising Drone Power: Turkey On The Eve Of Its Military Breakthrough," *Center for Economics and Foreign Policy Studies*, June 1, 2018. (<https://edam.org.tr/en/the-rising-drone-power-turkey-on-the-eve-of-its-military-breakthrough>)

145. Levon Sevunts, "Bombardier Recreational Products Suspends Delivery of Aircraft Engines Used on Military Drones," *CBC News* (Canada), October 25, 2020. (<https://www.cbc.ca/news/politics/turkey-armenia-azerbaijan-drones-bombardier-1.5775350>)

146. "After US Sanctions, Turkey Faces Arms Embargo from Canada over Violation of Drone Norms," *The EurAsian Times* (India), April 13, 2021. (<https://eurasianimes.com/after-us-sanctions-turkey-faces-arms-embargo-from-canada-over-violation-of-drone-norms>)

147. Burak E. Bekdil, "How Turkey Bypasses Western Arms Embargoes," *Begin-Sadat Center for Strategic Studies*, June 29, 2021. (<https://besacenter.org/turkey-arms-embargoes>)

148. "The Czech Republic Has Imposed an Arms Embargo on Turkey, Following Other EU Member States," *CZDEFENCE* (Czech Republic), October 16, 2019. (<https://www.czdefence.com/article/the-czech-republic-has-imposed-an-arms-embargo-on-turkey-following-other-eu-member-states>)

Finland	Complete arms embargo ¹⁴⁹	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	
Germany	Limiting arms sales to Turkey; ¹⁵⁰ German bureaucratic slow-rolling of MTU engine for Turkish next-gen battle tanks; ¹⁵¹ Germany halts plans to upgrade Turkish Leopard II tanks ¹⁵²	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	Germany has so far continued the production and sale of six Type 214 submarines to Turkey, to be delivered starting 2022. ¹⁵³ Other deals halted without official arms embargo.
Netherlands	Ban on new exports, hold on existing licenses ¹⁵⁴	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	
Norway	Complete arms embargo ¹⁵⁵	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	
Spain	Ban on new exports ¹⁵⁶	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	
Sweden	Complete arms embargo ¹⁵⁷	Pursuant to EU-wide posture; Turkish military intervention in northern Syria	
United States	Expulsion from F-35 fighter program; Congress has paused arms sales	Turkish purchase of Russian S-400 missile defense system; Turkish military intervention in northern Syria	Congress quietly halted almost all arms sales, ¹⁵⁸ blocking the deals from moving forward without formal declarations.

149. Jonas Löfvenberg and Victor Blomdahl, “Finland Stoppar All Vapenexport till Turkiet,” *SVT Nyheter* (Sweden), October 10, 2019. (<https://www.svt.se/nyheter/utrikes/nu-finland-stoppar-all-vapenexport-till-turkiet>)

150. Robin Emmott, “EU Governments Limit Arms Sales to Turkey but Avoid Embargo,” *Reuters*, October 14, 2019. (<https://www.reuters.com/article/us-syria-security-eu-france/eu-governments-limit-arms-sales-to-turkey-but-avoid-embargo-idUSKBN1WT0M4>)

151. “Turkey’s Ruling AKP Blames Germany for Delay in Altay Tank Production,” *Ahval* (UK), December 16, 2020. (<https://ahvalnews.com/ssb/turkeys-ruling-akp-blames-germany-delay-altay-tank-production>)

152. “Germany halts plans to upgrade Turkey’s Leopard tanks” *Deutsche Welle* (Germany), January 25, 2018. (<https://www.dw.com/en/germany-halts-plans-to-upgrade-turkeys-leopard-tanks/a-42305167>)

153. Tayfun Ozberk, “Analysis: Why do Turkey’s upcoming Reis-Class Submarines Have Potential To Affect Balances In The Region,” *Naval News*, January 23, 2022. (<https://www.navalnews.com/naval-news/2022/01/analysis-why-do-turkeys-upcoming-reis-class-submarines-have-potential-to-affect-balances-in-the-region>)

154. Netherlands Ministry of Foreign Affairs, “Change of national export control policy with regard to Turkey following the Turkish army’s incursion into northern Syria,” October 15, 2019. (<https://www.government.nl/documents/publications/2021/10/15/change-of-national-export-control-policy-with-regard-to-turkey-following-the-turkish-armys-incursion-into-northern-syria>)

155. Jonas Löfvenberg and Victor Blomdahl, “Finland Stops All Arms Exports to Turkey,” *SVT Nyheter* (Sweden), October 10, 2019. (<https://www.svt.se/nyheter/utrikes/nu-finland-stoppar-all-vapenexport-till-turkiet>)

156. “Spain Stops Arms Exports to Turkey over Syria Offensive,” *Al Arabiya* (UAE), May 20, 2020. (<https://english.alarabiya.net/News/middle-east/2019/10/15/Spain-stops-arms-exports-to-Turkey-over-Syria-offensive>)

157. Ebba Thorneus, “Sweden Stops Munitions Exports to Turkey,” *Aftonbladet* (Sweden), October 15, 2019. (<https://www.aftonbladet.se/nyheter/a/MRjvEK/sverige-stoppar-krigsmaterielexport-till-turkiet>)

158. Valerie Insinna, Joe Gould, and Aaron Mehta, “Congress Has Secretly Blocked US Arms Sales to Turkey for Nearly Two Years,” *Defense News*, August 12, 2020. (<https://www.defensenews.com/breaking-news/2020/08/12/congress-has-secretly-blocked-us-arms-sales-to-turkey-for-nearly-two-years>)

POLICY RECOMMENDATIONS

U.S. policy toward Turkey should discourage Ankara's deepening defense industry cooperation with Russia and other NATO adversaries while laying the groundwork to re-establish a robust U.S.-Turkish defense partnership in a post-Erdogan era. This would entail:

- **Incentives and disincentives to discourage Turkey from deepening its defense industry cooperation with Russia and other NATO adversaries.** Incentives should include the opportunity to procure NATO military systems. Disincentives should include sanctions under CAATSA, which include sanctions against Turkey's defense procurement agencies and a ban on U.S. export licenses. Washington needs to manage this strategy carefully. It cannot become an appeasement policy that provides the Erdogan government with easy access to NATO equipment and technology while he undermines the alliance. A different approach will be necessary for each weapon system based on its characteristics.
- **Offering certain buyers of Turkish arms the opportunity to purchase comparable NATO systems.** Many U.S. allies and partners outside of NATO do not approve of Erdogan's foreign and security policy but feel obliged — since they cannot procure comparable NATO equipment — to purchase hardware from Turkey's defense companies owned by Erdogan's loyalists. The U.S. and other NATO members should calibrate export restrictions to give responsible buyers an alternative. Unmanned systems are one of these buyers' top interests.
- **A congressional request to the U.S. Government Accountability Office (GAO) to determine whether the use of U.S. military and dual-use technology in Turkish arms exports is consistent with U.S. law.** Turkey's past use of other countries' technology in military projects without proper authorization or licensing raises the question of whether Turkey is doing the same with U.S. technology, particularly dual-use engines. Washington should also employ various anti-corruption measures, including Global Magnitsky sanctions¹⁵⁹ and the Foreign Corrupt Practices Act,¹⁶⁰ to target corrupt actors and to dissuade reputable businesses from engaging with them.
- **Preparing plans to rebuild strong defense industry partnerships with Turkey in the event of an opposition victory in the country's 2023 presidential and parliamentary elections.**¹⁶¹ Previously, Turkey was not only a key importer of U.S. equipment and technology but also an integral part of NATO's supply chains. Today, maintaining institutional channels with Turkey's quasi-state defense companies, which can help restore cooperative relations with the United States and other NATO members in a post-Erdogan era, would be prudent. The prospect of future partnerships would provide incentives for Turkey's eventual return to the NATO fold and boost the country's legitimate defense industry players.

The invasion of Ukraine has shown that NATO will continue to face significant political and military challenges from Russia in the years to come. Although the Erdogan government has pursued a balancing act between Russia and Ukraine, Ankara is beginning to show signs of growing concern about Moscow's irredentist policies and may be interested in mending ties with the West.¹⁶² Hence, the Ukraine war offers NATO a unique opportunity

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159. "The Global Magnitsky Human Rights Accountability Act," *Congressional Research Service*, October 28, 2020. (<https://crsreports.congress.gov/product/pdf/IF/IF10576>)

160. "The Foreign Corrupt Practices Act (FCPA): An Overview," *Congressional Research Service*, June 29, 2020. (<https://crsreports.congress.gov/product/pdf/IF/IF11588>)

161. Turkey is scheduled to hold presidential and parliamentary elections during the summer of 2023, and the country's big-tent coalition bloc, which defeated many of Erdogan's mayoral candidates in the 2019 municipal elections, appears to be ahead of Erdogan's Islamist-ultranationalist coalition in the polls. "Ruling AKP's votes barely over 30 percent, show different surveys," *Bianet* (Turkey), February 21, 2022. (<https://bianet.org/english/politics/258031-ruling-akp-s-votes-barely-over-30-percent-show-different-surveys>)

162. Dimitar Bechev, "Turkey, between a rock and a hard place on Russia," *Politico Europe*, March 2, 2022. (<https://www.politico.eu/article/turkey-between-a-rock-and-a-hard-place-on-russia>)

to weaken Putin's influence over Ankara. Policies that incentivize Ankara to end its growing defense cooperation with Moscow and other NATO adversaries will be crucial to safeguarding the integrity of the transatlantic alliance. Returning Turkey and its defense industry to their pro-Western orientation remains a crucial task for strengthening NATO's southeastern flank.

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