The industrial strategy for the modernisation of the Turkish armed forces

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INTRODUCTION

Anatolia's strategic position in the Mediterranean arc gives it great importance in East-West exchanges while placing it at the junction of several economic and cultural spheres. Surrounded to the west by Greece, with which there is no shortage of disputes, to the north by a Black Sea considered as a Russian lake bordered by the republics of the former Soviet Union, and finally surrounded to the east by the Arab and Persian worlds, victims of chronic instability, Turkey has many reasons to be one of the most militarized countries in the world today. Equipped and armed for a long time by the American ally within the framework of NATO and the Cold War[1], Turkey has nevertheless implemented a strategy of increasing the power of its defense industry since the end of the 1980s. Indeed, if with the end of the Cold War came a period of reduced tension and military budgets in Europe, the famous "peace dividend", it was the opposite for Turkey.

The Turkish peninsula has found itself in close geographical proximity to the most unstable area of the post-cold war world, the Middle East. This, coupled with the ongoing tensions with the PKK, an organization claiming independence from the Anatolian Kurds that is considered a terrorist organization by NATO members, has led to a strong desire on the part of the Turkish government to develop a local defense industry producing weapons systems tailored to its needs. It is also worth mentioning that the coming to power of the AKP in 2003 and the rise of Recep Tayyip Erdoğan[2] has awakened a strong nationalist current in the country, which leads to push its foreign policy in the direction of neo-Ottoman thinking. The autonomy of the Turkish arms industry thus has the dual purpose of providing weapons systems adapted to the operational conditions of conventional armies, but also of giving Turkish diplomacy a significant weight in its actions and claims on the regional scene. Turkey has thus succeeded in going from a nation dependent almost entirely on imports to equip its army to a country whose drones, which will soon be entirely domestic, have been described by many as the main weapon that enabled Azerbaijan's victory in Nagorno-Karabakh. But far from being limited to drones,

[1] Turkey was of particular importance during the Cold War, being the only NATO country in direct proximity to the Middle East and bordering the south-eastern flank of the USSR and the Warsaw Pact. The country has US nuclear bombs pre-positioned on its soil, and it was the deployment of US nuclear missiles on its shores that triggered the Cuban crisis.

[2] Prime Minister from 2003 to 2014, then President of the Republic.

the Turkish military's effort to acquire equipment from domestic defense companies is aimed at all weapons systems. Now capable of building first-rate frigates, working to build armored vehicles that can compete with ageing Western models, and even having the will to develop a very complex 5th generation fighter, the Turkish arms industry is without doubt one of the most dynamic of the moment.

A well-orchestrated co-production strategy

The rise of the Turkish defense industrial and technological base took place in five successive stages that enabled a country suffering from a significant technological backlog to create a program for the development of a fifth-generation fighter within 30 years. Until the mid-1990s, the Turkish army went through a known pattern, applied by many countries, of modernizing its forces by buying weapons from abroad. American tanks and aircraft, German ships and submarines, the Turkish army was equipped with weapons systems designed and produced abroad, sometimes second-hand. There are, however, some early examples of the second phase, co-production and licensed production, in the history of Turkish military procurement.

The best example is undoubtedly the licensed production of the F-16 Fighting Falcon, Turkey being one of the five countries in the world authorized to produce them[3]. This second stage of the strategy of increasing the power of the domestic arms industry has many advantages. Although it does not create a research dynamic, co-production not only trains a skilled workforce for the production of high-tech equipment, but also allows for the establishment of production facilities that meet the highest standards and are easily replicable. This strategy was then extended to many of the weapons systems equipping the Turkish army. In the air transport sector, TAI (Tusas Aerospace Industries) also produces *CASA* transport aircraft under license, *Eurocopter AS 532* helicopters and participates in the construction of the *A400 M*. Similarly, Turkish industry has been involved in the licensed construction of infantry tanks *via* a joint venture between NUROL and United Defense since the late 1980s[4]. These programs were clearly aimed at structuring, the idea being to give contracts to foreign

[3] "F-16 Peace Onyx", *globalsecurity*.org, https://www.globalsecurity.org/military/world/europe/tu-f-16.htm
[4] *FNSS*.com, https://www.fnss.com.tr/en/who-we-are/company-profile

companies only on the condition of local production. We can see examples of this in almost all major arms projects, apart from purely national production and purchases of demonstrators, such as Israeli drones or Russian anti-aircraft systems. These are often purchased with the aim of *reverse-engineering them* and producing national versions afterwards.

This strategy was extended to all sectors of the Turkish military, sometimes long before the AKP came to power. Half of the four *Yavuz-class* frigates from the *MEKO 200* family, built by the German shipyard TKMS, were produced under license in Turkey at the end of the 1980s. The same pattern was repeated for the four *Barbaros-class* frigates produced in the following decade. The German naval industry became the main collaborator of the Turkish industry, whether for frigates or for submarines. Indeed, eleven of the twelve submarines in service in the Turkish Navy were built under license from German designs, the twelfth being produced directly in Germany. No less than five *Reis* class submarines, based on the Type 214, are currently in production at the Gölcük shipyards, with the first one already in service. These submarines are part of the Milden program, which aims to build a new class of eleven submarines nationwide. The *Reis* class is therefore not a simple model built under license, it could be better described as a co-production, with the German partner giving access mainly to the anaerobic fuel cell, propulsion and air recycling technologies, i.e. 20% of the industrial production[5]. This new class, which is quieter, more modern and can stay underwater longer, is also capable of firing anti-ship missiles and cruise missiles. The *Reis* class submarines thus provide Turkey with an offensive potential that few nations can claim. With no less than sixteen major Turkish companies involved in the project, plus a large number of subcontractors, this is another example of the structuring aspect of weapons programs on the Turkish defense industrial base.

This increase in capacity can be measured in particular by the tonnage of locally built ships, the first helicopter carrier, which can also act as an aircraft carrier, SVTOL[6], of the Turkish Navy, due to be armed by the end of the year[7]. This miniature aircraft carrier of the *Juan Carlos I class* was built under license from Spanish designs in a Turkish yard, a national first for a ship of this tonnage. The TCG *Anadolu* should soon be followed by a second one, thus transforming Turkey's projection capabilities. Although it can no longer receive *F35-Bs* to

[5]"Reis class Type 214 New Type Submarine Project", *globalsecurity.org* https://www.globalsecurity.org/military/world/europe/tcg-ntsp.htm
[6] Capable of deploying short take-off and vertical landing aircraft.
[7] "TCG Anadolu Multipurpose Amphibious Assault Ship, *naval-technology.com* https://www.naval-technology.com/projects/tcg-anadolu-multipurpose-amphibious-assault-ship/

equip its flagships since Turkey's exclusion from the American program, the Turkish Navy intends to equip them with UAVs to increase their operational capabilities while waiting for the naval version of the fighter under study[8].

In the air sector, TAI was once again in charge of the joint development of the *T129 Atak* attack helicopter, based on the Italian *Mangusta* platform. This aircraft, in great demand for export, could not however be freed from American components and could not be sold because of the sanctions imposed by the Trump administration[9]. These sanctions, if they weaken the Turkish defense industry in the short term, nevertheless give it every reason to free itself entirely from American tutelage in terms of armaments and thus risk pushing Turkey to follow the same path as France, or at least that of India. The industry on the other side of the Atlantic may begin to see a decline in the number of countries wishing to acquire US weapons as more and more countries are reluctant to support the extra-territoriality of US law. Beyond the export criteria, it can be observed that once again Turkey has succeeded in producing, albeit in co-production, a competent and popular weapon system in the arms markets.

The national design: successes and failures

The strategy of building under license in order to structure the Turkish arms industry seems to be bearing fruit, the best example being undoubtedly the case of the shipyards. As written above, Turkey has produced many ships from foreign designs in the port of Gölcük, and then also in the SEDEF shipyard in the bay of Tuzla, where part of the industrial capacity was redeployed after an earthquake. These shipyards were thus able to acquire the necessary machinery and train their crews on foreign-designed ships, which now gives them the capacity to produce domestically designed ships. The origin of all this is the MILGEM program[10], which started in the 1990s and aimed to provide the national navy with ships designed, produced and

[8] David AXE, "Without The F-35, The Turkish Navy Is Desperate For Carrier Planes", *Forbes*, 23/04/2021, https://www.forbes.com/sites/davidaxe/2021/04/23/turkish-navy-gets-desperate-as-f-35-kerfuffle-leaves-flattop-plane-less/?sh=7372e0fb3680

[9] Anwar IQBAL, "US blocks delivery of Turkish gunships to Pakistan", *DAWN*, 10/03/2021, https://www.dawn.com/news/1611685/us-blocks-delivery-of-turkish-gunships-to-pakistan

[10] "Milgem Class Multimission Corvettes, *naval-technology*.com, https://www.naval-technology.com/projects/milgem_class_corvett/

equipped in Turkey. The first class of nationally designed ships were the *ADA* class corvettes, intended for patrol and anti-submarine actions. Four of these ships were built between 2005 and 2015 for Turkey, four are planned for Pakistan, and two more will be built following an order from Ukraine. And this is where we can see the strategy of moving up the value chain. Having built these corvettes, it is now the *Istanbul* class frigates, based on the *Ada* class, that are coming on stream, with the first one launched in January 2021. These ships, displacing 3,000 tons, are now in the same category as the French second class stealth frigates *La Fayette*.

The *Istanbul* class represents a real leap forward in terms of capability, as although they are close to corvette size, they are the first Turkish frigates to be multi-role. They also foreshadow the third part of the MILGEM program : the construction of a destroyer. The *TF-2000* class, whose first ship is expected in 2027, will provide the Turkish Navy with capabilities, especially anti-aircraft capabilities, which were previously unattainable at a time when the notion of denial of access is taking hold of many staffs. Displacing 8,500 tons, no less than eight ships were to be built. By comparison, the French Navy's largest frigates, the *Horizon* class, displace just over 7,000 tons and have a capacity of 48 anti-aircraft missiles, compared with the Turkish destroyer's 64. It should also be said that France's future leading frigates, the *IDF*, will be built in only five units and will have a displacement of less than 4,500 tons. The MILGEM program can therefore be considered a success, giving the Turkish Navy unprecedented quantitative and qualitative capabilities in less than 40 years. Turkey is also modernizing its *Barbaros* class frigates in order to extend their longevity, and the Turkish Navy will be able to count on no less than sixteen frigates and destroyers in the Mediterranean to support the Blue Homeland doctrine[11], or *Mavi Vatan* in Turkish, of maritime expansion. To this must be added the ambitious program for the development of *ULAQ / SIDA* marine drones, the first models of which are already deployed. Turkey hopes to produce no less than 50 of them per year[12]. If all these ships have not yet been able to prove the quality of their design, they pose an operational challenge and definitively anchor Turkey in its role as a regional maritime power.

[11] Legal, diplomatic and military doctrine claiming a larger Turkish maritime space than that set by the 1982 United Nations Convention on the Law of the Sea (UNCLOS), which Turkey has not ratified.

[12] "Turkey to Produce 50 Units of Armed Unmanned Marine Vessel a Year", *defenseworld.net*, 10/05/2021, https://www.defenseworld.net/news/29539/Turkey_to_Produce_50_Units_of_Armed_Unmanned_Marine_Vessel_a_Year#.YYen3NnP250

While the MILGEM program seems to be a success at this stage, this is not the case for all the Turkish army programs. Thus, the MiTÜP[13] program is struggling to give birth to the *Altay* tank, the future "*Main Battle Tank*" of the Turkish Army. As in the case of the *T-155 Firtina* (a self-propelled howitzer), cooperation with the South Korean arms manufacturer Hyundai and its subsidiaries is planned, although the Asian partner was to be only marginally involved in the creation of a domestically produced tank. However, this program has had many setbacks. The contract was originally awarded to Otokar, a car manufacturer with no experience in the field of armored vehicles, and the proximity of the company's CEO to political power created a scandal. However, Otokar was not the only one involved in this project, which not only involved big names in the Turkish armament industry such as Aselsan, Roktsan and MKEK, but also nearly 200 subcontractors in the country. Otokar's inability to develop an engine block and transmission suitable for a 65-ton tank led Turkey to turn once again to its German ally to equip the *Altay with* parts from the Leopard II program. The salvo of sanctions from across the Rhine after the Turkish operation against the Kurdish self-protection forces (YPG) in northern Syria put an end to this import project. The Turkish government then took control of the project from Otokar and gave it to the traditional Turkish armor manufacturer, BMC, which was responsible for developing a domestic engine and transmission. After another failure, the manufacturer announced in March 2021 its willingness to import these systems from other South Korean third parties, Doosan for the engine and SNT Dynamics for the transmission. This tank, which is less and less of a national design, should, if there are no further delays, enter service in 2023. It should be remembered, however, that while Turkey seems to be having difficulty developing a heavy tank on its own, the Turkish Army still has more than 3,000 tanks in operation, with older models such as the *M48* and *M60 Patton* being regularly modernized, which puts Turkey at the head of one of the largest armored forces in the world. To these 3,000 tanks should be added 1,000 units of *Altay* tanks, in increments of 250.

Of all the Turkish national armament programs, the best known and most successful are undoubtedly the drone programs[14], from which the *Bayraktar TB2* is derived, a drone that became a worldwide success after the Azerbaijani army made it the key system for its victory in Nagorno-Karabakh in 2020. The drone is the result of a program that began in 2007 with a tender from the Turkish army, which was looking to acquire surveillance drones, a tender to

[13] Burak BEKDIL, "Turkey, South Korea sign deal for Turkish Altay tank", *defensenews.com*, 25/10/2021, https://www.defensenews.com/land/2021/10/25/turkey-south-korea-sign-deal-for-turkish-altay-tank/

[14] Burak BEKDIL, "The Rise and Rise of Turkish Drone Technology", *BESA Center*, 11/04/2021, https://besacenter.org/the-rise-and-rise-of-turkish-drone-technology/

which Baykar Defense, the company of Recep Tayyip Erdoğan's son-in-law, responded. After the design of a first version, the *Bayraktar TB1*, equipped with a double-redundant linkage system and a landing and take-off capacity approaching total autonomy, it is the more secure and autonomous "Block B" that has won the Turkish army's full support. The rest is now history: deployed in Nagorno-Karabakh, Syria, Iraq, Libya, and even in Turkey against the PKK, the *Bayraktar TB2* has been involved in all the regional conflicts in which Turkey has been involved, and is now equipped with nearly 150 of these drones. While they remain limited in terms of payload and range (150kg and 150km), not to mention the fact that these operations have been conducted in areas not covered by an air-to-air fighter, the *Bayraktar TB2* does bring UAVs into the doctrines of armed forces' use in medium and high intensity conflicts. With a price tag of only $5 million per unit, this makes it one of the most sought-after UAVs for export, with no less than eight countries having already placed orders, and another ten countries expressing interest. The *Bayraktar TB2* thus offers real air capabilities at modest prices to countries facing insurgency or medium-intensity conflicts.

Where we can see that this program is a real structuring element for Turkish industry is that following the desire for national production and certain embargoes, the new versions of this drone will indeed be 100% produced in Turkey. We find the ammunition and missile manufacturer Roketsan to equip the drone with the famous UMTAS anti-tank ammunition and MAM-C and MAM-L micro-munitions, and the manufacturer Alesan for the optical equipment of the drone. The technologies already developed are now being reused in the design of a *Bayraktar TB3*, equipped with a satellite antenna. A naval version of the UAV is also being studied for the Turkish Navy's new helicopter carriers. Moreover, the Turkish UAV industry is one of the most productive in the world, with no less than seven nationally produced UAVs equipping the armed forces or under development. In order to compensate for the limitations of the *Bayraktar TB2*, which was actually used as a test platform, TAI is producing the 30 *TAI Anka* MALE UAVs, whose capabilities are similar to those of the *Reapers* with a new generation of satellite capability. In addition to this, TAI is also producing heavy MALE UAVs, with the twin-engine *Aksungur* UAVs with a range of 6,500km and a payload of 750kg.

To this must be added the new and future developments of Bayraktar, which wishes to produce equivalents of the *Neuron* and *Eurodrone* UAVs in a much shorter timeframe. The *Baykar Akinci* HALE UAV, of which four models already equip the Turkish army, is capable of carrying 1,350kg of payload over 7,500km and has been designed using many of the technological building blocks previously used in the TB2 program. Finally, the *Baykar MİUS*

*d*rone is the most ambitious. This drone, scheduled to make its first flight in 2023, will be stealthy and capable of supersonic speeds, while carrying 1,500kg of payload for five hours[15] . It should also be capable of being deployed from helicopter carriers. We can thus see that Turkey, through a strategy of moving up the value chain supported by the State, starting with simple models in order to validate the technological bricks as they are developed, has managed in barely 20 years to become one of the producers of the best UAV systems on the international scene. By way of comparison, France has not managed to capitalize on the success of the *Neuron* program, whose development of a drone usable by the army is still not planned 20 years after the program began. The *Eurodrone is* not expected to start being deployed until 2028.

Finally, it is worth mentioning the very ambitious development program for a Turkish 5th[e] generation fighter. Built by TAI, the *TF-X*[16] is not an entirely national design, being equipped with General Electric F110 engines, built under license of course. If Turkey succeeds in producing a very complex 5-generation aircraft, which there is no guarantee of, the first flights should take place as early as 2025, with deployment planned for 2028. These stealth aircraft will have to be able to handle drones and will be equipped with a full suite of weaponry. The *TF-X* should be produced in 250 units. France, on the other hand, wants to skip the design of this generation fighter by continuing to upgrade its *Rafale* aircraft and go straight to a 6-generation fighter by 2030-2040, while many countries will actually be equipped with 5-generation fighters within the next five years. With a geopolitical tempo that increasingly points to a high-intensity conflict by the end of the decade, one wonders whether France should not produce a light fighter model intermediate between the *Rafale* and the *SCAF*, not only to strengthen its Air Force and Space Force but also to validate the first technological building blocks of the *SCAF* program.

[15] " Fighter UAV, *baykartech.com*, https://www.baykartech.com/en/figther-UAV/
[16] "TAI TF-X Stealth Fighter, *airforce-technology.com*, https://www.airforce-technology.com/projects/tai-tf-x-stealth-fighter/

Conclusion

The Turkish arms industry's build-up strategy, which began in the twilight of the Cold War, can only be welcomed. After the stages of procurement, licensed production, partial designs and national designs, Turkey can now enter the final part of its strategy: technology development. This strategy, supported by a budget of $18 billion [17]each year, is well on its way to achieving its goal: the creation of a largely self-sufficient national defense industry by the centenary of the Turkish republic in 2023. Despite some setbacks, the Turkish military, previously supplied only with foreign equipment, is expected to be equipped by the end of the decade with first-rate, nationally designed weapons systems by making up for some of the missing capabilities through strategic partnerships with foreign companies. By 2030, Turkey will therefore have the aircraft, drones, tanks, ships and submarines it needs to define itself as the leading power in the region and to support its ambitious diplomacy. With a well-equipped army that is no longer dependent on imports that subject its foreign policy to the will of other countries, it is also conceivable that Turkey could definitively anchor itself in the group of newly industrialized countries that wish to challenge the international order established by the victors of the Second World War more than 75 years ago.

[17] " The Defence Industry in Turkey", *Advantis Consulting*, https://www.advantisconseils.com/img/yayindosya/defense-securItedosyafr-748.pdf