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PROGRAMME DEFENCE, STRATEGY, ARMAMENT

WHAT DOES "WARTIME ECONOMY" STAND FOR?

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INTRODUCTION

It was in France that the term “wartime economy” was used for the first time, by the French President at the Eurosatory show on 13 May 2022[1]: “an economy in which **we will have to move faster**, think differently about the pace, the **ramp-up**, the **margins**, to be able to **reconstitute** more quickly what is essential **for our armed forces, for our allies or for those we want to help**”. However, **few politicians from other countries use this term**, although the majority agree with the overall thrust of the policy to be pursued: to produce more and faster, both to support Ukraine and to defend European territory. Several hypotheses can be briefly mentioned: some may think that we are not directly at war and that a war economy can only be applied in this context, others may not want to take drastic measures that would penalise public finances and would prefer to move forward slowly as long as the danger is not imminent, others would implement policies without talking about them, or still others would not wish to use a term without having the means to implement what it implies, sometimes denouncing the communication dimension of the term. And yet, as we shall see, war economy can be seen as a more global policy than simply that pursued in times of war[2]. In this respect, the change of name of the EU's plan to finance European defence, from “Rearm Europe” to “Readiness 2030”, speaks volumes about the apprehension of the words “war” and “armaments” in Europe today (“the name is excessively charged and risks alienating citizens”)[3].

Traditionally, the war economy is a relatively simple term used to describe how a **state**'s economy **supports its war effort**, or more precisely, how it “produces, mobilises or allocates resources to support violence”[4]. Note that there are different expressions for “war economy”: “wartime economy” includes the temporal dimension, unlike “war economy” or “economy of war”. The inclusion of time in the first expression specifies that it refers to the economy of the war period, which would make the expression “real wartime economy” a pleonasm. However, in view of its current use, it is possible to envisage a broader understanding of the concept, particularly on the temporal scale.

The issues raised using the term are manifold. Does it make sense to use it outside wartime? Is it possible to envisage a new concept that would be more useful in achieving the stated

[1] Emmanuel Macron, "Déclaration de M. Emmanuel Macron, président de la République, sur les industries d'armement françaises et européennes, à Villepinte le 13 juin 2022". Direction de l'information légale et administrative [online].
[2] Committee on Finance, the General Economy and Budgetary Control of the French National Assembly, "Rapport d'information [...] sur l'économie de guerre", March 2023 [online].
[3] Jorge Liboreiro, "Brussels Confirms 'Rearm Europe' Rebrand after Backlash from Italy and Spain", *Euronews*, 21 March 2025 [online].
[4] Philippe Le Billon, *Geopolitics of Resource Wars: Resource Dependence, Governance and Violence* (London: Frank Cass, 2005).

political objectives? Do Europeans and their industry have the capacity to move to this new paradigm? What are the public and private policies put in place in this context?

Although less frequently addressed in the study, the issue of burden-sharing within an alliance system weighs heavily on the type of economy and policy under consideration. The tensions between the quantity of equipment and its quality, or between "mass" and "high technology", between short and long range, between long-term and short-term programmes, and so forth, determine the overall economy of a military build-up effort. A war economy thus depends on the perception of the threat, which influences the identification of requirements and the strategy for allocating resources. The question of the coherence of European efforts would therefore arise within the current European alliance system, given that states do not necessarily pursue the same policies.

What does the notion of a wartime economy mean today?

We begin by (1) outlining the reasons why a war economy might be appropriate and proposing a more precise concept than the one currently used. Next, (2) we will look at the current limits of its implementation. Finally, (3) we will consider the various possible components of the war economy today.

WHY DO WE TALK ABOUT WARTIME ECONOMY?

A brief historical review puts the term into perspective

Some may justify talking about a wartime economy today to **mark a break with the last thirty years**, during which the defence economy has declined in most European countries[5]. Producing less and more slowly was a response not only to a fall in demand - which in this sector is solely that of governments - but also to the need to retain the bare minimum of industrial skills and supply chains to achieve an economically sustainable minimum[6]. Producing at a high rate and in quantity implies significant investment in production equipment. However, if the order comes to an end after a few years, the investment in this equipment will not have paid for itself, and suppliers will not be able to finance unused production equipment, particularly those companies furthest up the production chain. Exports can keep them going, but by their very nature they are uncertain, which is why orders

[5] "SIPRI Military Expenditure Database", SIPRI [online].
[6] National Assembly Committee on National Defence and the Armed Forces, "Rapport d'information [...] sur les enjeux et perspectives de l'économie de guerre", March 2025 [online].

from producer countries are essential if production is to continue[7]. However, between 1990 and 2020, national orders are relatively low compared with a previous period during which war in Europe seemed more likely[8]. If we look at military spending in 1990 and 2023 as a percentage of gross domestic product (GDP), most European countries are nowhere near their levels at the end of the Cold War (Table 1).

Table 1 – Military spending in 20 European countries in 1990 and 2023 as a percentage of gross domestic product, and changes therein

Country	1990	2023	Change (%)
Bulgaria	3.83 %	1.85 %	-51.81 %
Hungary	2.56 %	2.13 %	-17.00 %
Poland	2.61 %	3.83 %	46.71 %
Romania	4.55 %	1.61 %	-64.51 %
Austria	1.20 %	0.84 %	-29.39 %
Belgium	2.36 %	1.21 %	-48.43 %
Cyprus	7.37 %	1.82 %	-75.26 %
Denmark	1.95 %	1.95 %	0.13 %
Finland	1.56 %	2.42 %	54.89 %
France	2.81 %	2.06 %	-26.70 %
Germany	2.52 %	1.52 %	-39.66 %
Greece	3.80 %	3.23 %	-14.85 %
Ireland	1.20 %	0.22 %	-81.98 %
Italy	1.88 %	1.61 %	-14.62 %
Luxembourg	0.79 %	0.75 %	-4.98 %
Malta	0.91 %	0.56 %	-38.94 %
Netherlands	2.37 %	1.53 %	-35.31 %
Portugal	1.84 %	1.52 %	-17.47 %
Spain	2.29 %	1.51 %	-34.20 %
Sweden	2.46 %	1.47 %	-40.16 %
United Kingdom	4.00 %	2.20 %	-45.00 %

Source: SIPRI

[7] Michael Pooler and Sylvia Pfeifer, "Fears over Defence Industry Skills as United Kingdom Waits for New Typhoon Orders," *Financial Times*, January 14, 2025 [online].

[8] Sune Rasmussen, Alistair MacDonald, "Europe's Quest to Rearm Runs Into Red Tape, Lack of Cash-and Meditation", *The Wall Street Journal*, September 29, 2024 [online].

Moreover, most Europeans have not experienced an existential war since the Second World War. At that historical juncture, the interests of nations came down to their survival, which justified defence spending at levels more than 30% of GDP. In the United Kingdom, the proportion of GDP devoted to defence was 7.4% in 1938 and 43.8% in 1940 (and continued to rise thereafter)[9]. The war period is generally accompanied by a fall in GDP growth and high inflation, although the overall effects on the economy are nuanced[10]. Another constant is state control of the economy, including the nationalisation of vital businesses, as well as severe constraints on the civilian population, such as rationing[11]. With reference to the world wars, we could therefore describe trends in the wartime economy.

However, **there is no single case of a war economy**, which all states would have applied, as it depends on the players, the state of the economy and the alliance system in which they are involved. In 2022, Ukraine suffers a military invasion of its territory, and the survival of its current state is threatened, leading to a fall in GDP of around 30% over the year[12]. However, in 2023 and 2024, Ukraine's economic growth picks up again (respectively a GDP of 179 billion dollars - 5.3% growth and 190 billion dollars - 3.5%[13]), with an estimated 70% of the country's economy operating[14]. What is more, during the Second World War, national GDP trends varied and broadly followed the trends in the balance of power, with German GDP falling from 1943 onwards, for example, after having risen sharply in previous years[15]. High-intensity warfare did not necessarily lead to economic collapse. Cooperation, diversification of economic outlets and help from allies are factors of economic resilience, even in war.

There are therefore no uniform models of wartime economy to follow, and the economics of the world wars is not necessarily the example to replicate. The form of the economy of high-intensity warfare in the 21st century is therefore different from past forms, which would allow a broader understanding of this notion than was previously the case.

[9] Stephen Broadberry and Peter Howlett, "The United Kingdom: 'Victory at all costs'". In *The economics of World War II: Six great powers in international comparison,* ed. Mark Harrison (Cambridge University Press, 1998), pp. 47-72. [online].
[10] Clifford Thies, Christopher Baum, "The Effect of War on Economic Growth," *Cato Journal* 40, n°1 (2020) [online].
[11] Mark Harrison, "The Economics of World War II: An Overview.", in *The Economics of World War II: Six Great Powers in International Comparison*, ed. Mark Harrison (Cambridge University Press, 1998), pp. 1-42. [online].
[12] "Ukraine", Country, Organisation for Economic Co-operation and Development [online].
[13] "World Economic Outlook Database, International Monetary Fund" [online].
[14] Bertrand Barrier, "Business life in Ukraine: suspension, but not destruction", interview by Anne Portman, *La Lettre des juristes d'affaires* [online] .
[15] Mark Harrison, "The Economics of World War II: An Overview," In *The Economics of World War II: Six Great Powers in International Comparison*, ed. Mark Harrison (Cambridge University Press, 1998), pp. 1-42. [online].

The current European strategic environment raises the political question of the possibility of war

Against the backdrop of Ukraine's existential war, the threat to European security and the increase in hybrid strategies - particularly Russian but not exclusively - against Europeans, the latter have undertaken to support Ukraine in the defence of its territory, particularly through the delivery of equipment. Although the delivery of heavy equipment (armour, missiles, etc.) took place mainly in the second year, after a first year in which the theme of co-belligerence took precedence over the need for Ukraine to make progress, the European states quickly realised that **their stocks were low**, which limited this support *de facto*, and that they were **running the risk of weakening their own defence** by losing expertise in certain equipment without being re-supplied in the short term[16]. A telling example is Denmark, which has delivered all its self-propelled guns despite having recently acquired[17]. At the same time, European countries have also committed to strengthening their defence systems. **Replenishing stockpiles and increasing power has therefore also been a European objective since the strategic shock**.

About a year after the French President used the term "wartime economy", European Commissioner Thierry Breton used it again on 3 May 2023 when he presented the ammunition production support regulation (ASAP), intended both for Ukraine and to replenish European stocks[18]. A year later, the European Defence Industrial Strategy (**EDIS**) was published, stating that "**the industry must invest in new capabilities and be ready to move to a 'war-fighting business model whenever necessary**"[19]. The European Union (EU) therefore uses the term officially.

Furthermore, can the German 'change of era' (***Zeitenwende***) be considered as a similar notion? It goes beyond the purely economic dimension and represents for Germany a political will to return to strategic affairs, to participate more in collective defence and to rearm its forces[20]. Wartime economy is therefore more a means of achieving a change of era. In the United Kingdom, the term "**new era**" has been used since the arrival of the new government

[16] *Annual Report 2022,* European Defence Agency (2023) [online].
[17] "Denmark amplifies Support for Ukraine with CAESAR Self-Propelled Howitzer", *Army Recognition*, March 13, 2024 [online].
[18] Thierry Breton, "Act in Support of Ammunition Production (ASAP)", Press conference, European Commission, 3 May 2023 [online].
[19] "A new strategy for the European defence industry to prepare the Union for any eventuality by equipping it with a responsive and resilient European defence industry", European Commission, High Representative of the Union for Foreign Affairs and Security Policy, 5 March 2024 [online].
[20] Rachel Tausendfreund, "Zeitenwende-The Dawn of the Deterrence Era in Germany", Insights, The German Marshall Fund of the United States, March 4, 2022 [online].

in 2024 and the drafting of a new strategic review[21]. The review, which is due to be published in May 2025, will examine the threats facing United Kingdom, the capabilities needed to deal with them, the state of the armed forces and the resources available, with the announcement that 2.5% of GDP will be spent on defence. The strategic change is thus largely integrated, but the consequences for the national industry are uneven, between political rhetoric resolutely oriented towards more defence efforts, and a corresponding lack of public orders and an expectation that manufacturers will take more risks[22].

As a result of the strategic upheaval, European **defence budgets have increased**, with upward revisions to the budgets voted for 2022 and an increase in the budgets for 2023[23] and 2024[24] (Tables 2 and 3). Investment budgets for procurement have doubled between 2022 and 2024 (Table 2). Secondly, the delivery of defence equipment to Ukraine has accounted for a significant proportion of European government transfers or sales. This equipment was initially taken from the stocks of European armed forces and, since the end of 2023, deliveries have come from the manufacture of new munitions or new domestically produced equipment. Finally, the acquisition of new equipment has begun. This represents a significant increase in demand in Europe, although it remains uneven and often awaiting firm orders. **Whatever the rhetorical use of the war economy or notions of the need to rearm, states have responded well to the new strategic reality of the increased likelihood of war in Europe**, at least in part.

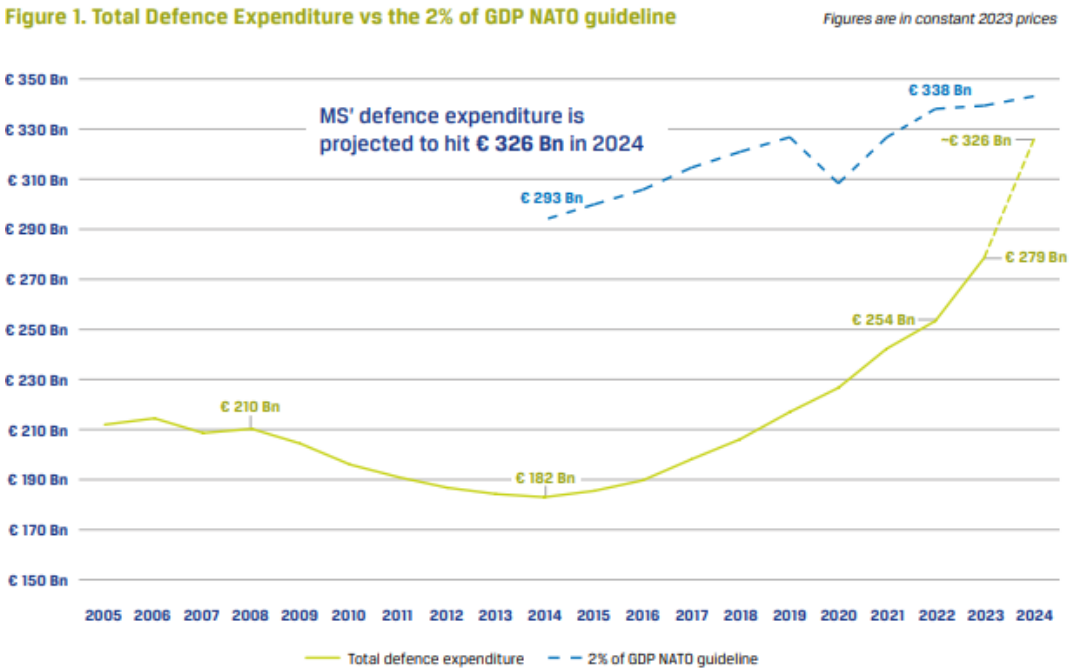
Table 2 – Changes in overall defence and investment budgets in 2022 and 2024

	Changes in the overall defence budget				Development of the defence investment budget			
	2022 (€bn)	**2024 (€bn)**	Constant change (%)	Current trend (%)	**2022 (€bn)**	**2024 (€bn)**	Constant change (%)	Current trend (%)
France	40.9	47.2	+15	+2	14.2	16.6	+17	+22
Germany	58.3	71.1	+22	+6	10.7	22	+105	+120
Italy	28.8	32.3	+12	-2	6	8	+36	+51
Sweden	7.9	11	+40	+26	1.8	4.4	+146	+168
Poland	12	27.1	+126	+99	4.8	11.2	+134	+160
UK*[25]	61.9*	63.7*	+ 2.8*	+ 1.4*	23.8*	22,7*	- 5*	- 2.5*

Source: IRIS

[21] "New era for defence: government launches root and branch review of United Kingdom Armed Forces", Press release, GOV.United Kingdom, July 16, 2024 [online].
[22] Gaspard Schnitzler, "From Buzzword to Reality? Changes in European Defence Industrial Strategies since February 2022" (IRIS, 2024) [online].
[23] Jean-Pierre Maulny, "The Impact of the War in Ukraine on the European Defense Market" (IRIS, 2023) [online].
[24] *EDA Defence Data 2023-2024,* European Defence Agency (2024) [online].
[25] In the United Kingdom, the fiscal year begins on 1 April and ends on 31 March. The figures selected for the 2022 and 2024 columns therefore correspond to the 2022/2023 and 2023/2024 fiscal years, respectively, as the data for 2024/2025 have not yet been published. Comparisons with other countries are thus limited.

Table 3 – Total defence spending and NATO's target of 2% of GDP



Source: European Defence Agency[26]

Towards a conceptualisation of wartime economy to better envisage its content

The context outlined above leads us to integrate three main dimensions if we want to conceptualise the notion of wartime economy:

- **"Wartime economy" as it is currently used is political**, so what it covers is subjective, and it could apply to several policies of different intensity and radicalism (compared with the previous situation).
- Given that Europeans (apart from the Ukrainians) are not at war *in the strict sense*, **the use of the term makes us think ahead of the confrontation** to anticipate the moment when one of the main objectives of the economy will change to support the war. In addition, economic models can help us to analyse the public policies implemented and anticipate a state's level of preparedness for war[27].
- Preparing the defence sector for the possibility of war also has a **deterrent** aspect: the more convincing the preparation seems, and the state of readiness seems complete,

[26] Ibid.
[27] Walter Arnaud, Grégory Chigolet, "Économie de guerre : pour une approche académique et stratégique de ce concept", *Revue de la Défense nationale*, nº877, February 2025, p.28-39 [online].

the less judicious aggression seems. The concept is partly one of “strategic warning”, or a form of what we might call "industrial deterrence".

One may think that wartime economy can now be understood as a political expression that has kept pace with **the increase in threats and has thus transformed the word "defence" into "war"**, since the word "defence economy" was previously sufficient to encompass the whole spectrum of economic policy applied to the field of national defence[28]. In short, **the increasing gradation of the threat is illustrated by the evolution of vocabulary**.

Consequently, and in view of the context, four types of mobilisations of economies, corresponding to four political objectives, could make up "wartime economy":

1) Supporting the ally over the long term - the war support economy.
2) Consolidate the defence architecture corresponding to the perception of the right level of threat - the war prevention economy.
3) Preparing for war - the war preparation economy.
4) Making and winning war - the economy in war.

These four components are not mutually exclusive (apart from 4 with 2 and 3). There is not necessarily a gradation from 1 to 4. However, the means envisaged to respond to them are not necessarily the same. Resources may be deployed to support the ally without necessarily preparing the supporting country for war. However, it can be estimated that in most cases, the amount of defence expenditure increases from 1 to 4.

For those wishing to achieve the first objective (and without considering direct intervention), the main means envisaged would be to deliver arms continuously over the long term, to provide intelligence and other services to the supported state to facilitate its operations, and to provide financial loans or other banking facilities.

For the second, the defence architecture should be adapted to the perceived threats, with means to deter potential enemies from attacking, to promote defence industry financially and economically, to develop policies to increase the number of military personnel, to carry out regular exercises and to develop cooperation.

To achieve the third objective, the policy implemented under the second would be significantly strengthened, with several levers of the state and civil society being prioritised to meet the needs of the armed forces, build up substantial stocks, mobilise the civilian sector

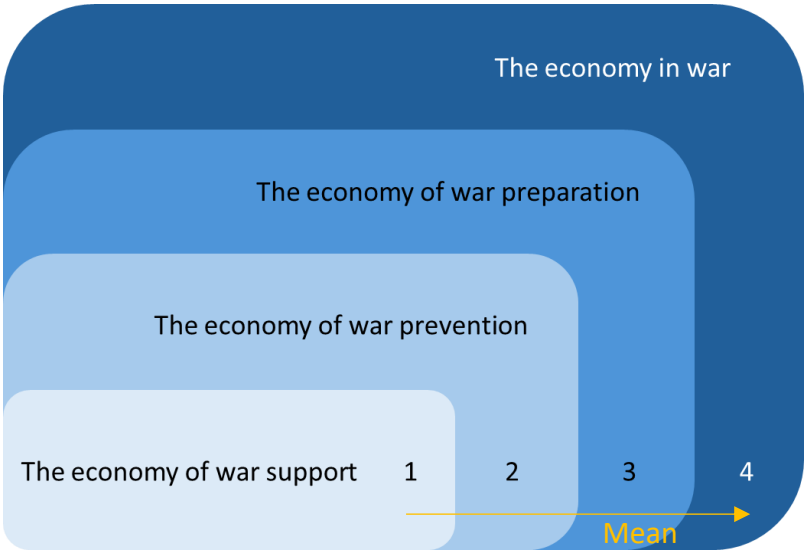
[28] Renaud Bellais, Martial Foucault, Jean-Michel Oudot, *Économie de la Défense* (Paris: La Découverte, 2014).

for military purposes, prepare the population for war, etc. Moreover, preparing for war does not mean wishing for it (si vis pacem para bellum), but would correspond to the idea of reinforced deterrence and the ability to go to war if necessary.

Finally, the fourth and last objective would call for total control of the economy by the state and several specific means to ensure the survival of the population and the powers that be in the context of a conventional war.

These four policies can be modelled in the diagram below, forming the concept of the wartime economy as a political expression.

Diagram 1 – Concept of wartime economy based on a four-scale model



Source: Author

For example, several European states could support a partner (1) and have a defence architecture corresponding to the right level of threat it considers it faces (2), and would have the ambition to move on to preparing for war (3) because they would like its armed forces and industries to be ready to wage war if it comes, and therefore, as a matter of principle, with surprise. It would seem that this policy is the ambition of most European states today. A state that does not support the ally in question, however, could fit into 2 but not 1. We could also put forward the hypothesis that a particularly threatened state could make the transition from 2 to 3 by abandoning 1 in order to maximise its investment. But 1 can still be part of policies 2, 3 and 4, because the support of allies can also be a means of winning the war.

The major challenge of 3, preparing for war, would seem to be the ability to switch to 4 almost instantaneously, or in any case, before vital interests are affected. This is also the most pressing issue now in Europe, and to some extent justifies the use of the term "wartime

economy". In short, **the proposed conceptualisation would make it possible to move beyond the debate on the relevance of the term "wartime economy" today**, in order to:

- Divide it into four types of policy, making it less vague.
- At the same time **clarify what is currently at stake in the discussions in Europe: it is indeed the third policy of wartime economy that is at stake, and therefore a policy of preparation for war**. **Consequently, the use of the latter term seems more judicious, while not denying the political expression that embraces it.**

Today, we can assume that most Europeans are at level 2 and want to move on to level 3. The assumption is that being at level 3 intrinsically paves the way for a possible move to level 4. The objective for those countries that wish to do so would therefore be to fully reach level 3.

The following sections aim to clarify the difficulties and then the possible policies for moving from 2 to 3, which is an essential step for moving from 3 to 4.

THE CHALLENGES OF WARTIME ECONOMY

The difficulties of increasing production

- **On the supply side: procurement, skills and development**

Paradigm shifts in supply chains

One of the first difficulties in increasing production seems to concern the supply of components from suppliers. We have seen that demand in Europe has risen overall since 2022, but production capacity is taking longer to adapt because of limited supply[29]. Components, particularly electronic components, semi-conductors, crystals, chemical inputs, etc., are increasingly used in defence equipment. Many large companies have reported difficulties in increasing their own production due to supply chain limitations[30].

First, it should be remembered that the defence sector is a small economic sector, because only governments are customers. As a result, the suppliers of large, small arms groups have to turn to the civilian sector if government orders are not forthcoming in the defence sector. Production lines assigned to defence must be assured of regular orders in order to maintain

[29] "Challenges of Ramping-Up Defence Production Capacity", ASD Position Papers, Aerospace, Security and Defence Industries Association of Europe (ASD), August 21, 2023 [online].
[30] Alistair MacDonald, Noemie Bisserbe, "This Missile Maker Is Racing to Rearm Europe", *The Wall Street Journal*, March 17, 2025 [online].

themselves, failing which the production line is reassigned to other sectors or dismantled. At the same time, small and medium-sized subcontractors do not necessarily have the financial capacity to increase their production even marginally, particularly if demand for defence is too low[31]. In addition, small and medium-sized enterprises (SME) in the defence sector face significant difficulties in accessing finance, despite the growing demand for military capabilities, with almost 40% of European defence-related SME stating that they have difficulty in obtaining external finance, due in particular to complex regulatory frameworks and the lack of suitable financial instruments[32].

In addition, subcontractors are partly located outside Europe, which slows down supplies, especially in the context of recurring geopolitical tensions, as is currently the case in the Red Sea, where military operations are necessary to maintain maritime traffic. In a sector such as defence, the elongation and dispersion of supply chains because of globalisation are becoming a major factor in the risk of production disruption[33]. However, this does not only concern subcontractors[34].

Certain sectors are therefore seeing their strategic interest reappear in the current environment, which is riskier than before, and not only armaments (health, energy, etc.). On the one hand, producer countries can limit exports because of the risks they face, thereby prioritising their own demand, and on the other, they can use their customer's dependence to exert political pressure. Europeans should therefore review their strategic supply policy in order to reduce their dependence and absorb the first shock so as to be able to increase their production significantly.

Labour is also an essential factor

Secondly, there is a limited supply of labour in the defence sector. We will not go into detail here about the possible causes of the sector's lack of attractiveness, but we can already point to a mismatch between supply and demand. In France, according to the *Délégué général de l'Armement* (DGA), there were 10,000 vacancies at the end of 2024[35]. In the United Kingdom, a 2024 report also warned of a shortage of employees in science and technology jobs, with

[31] European Commission: Directorate-General for Defence Industry and Space, *Access to equity financing for European defence SMEs* (Publications Office of the European Union, 2024) [online].
[32] Ibid.
[33] Paul Hérault, "L'internationalisation des chaînes de valeur dans l'industrie de défense : le cas du naval", PhD thesis in Economics and Finance, Université Paris Sciences et Lettres, 2018) [online].
[34] Daniel Fiott, "Security of Supply: How Can the EU Help Ensure Defence Preparedness?", CSDS Policy Brief, September 3, 2024 [online].
[35] Emmanuel Chiva, "Enjeux de l'économie de guerre : audition de M. Emmanuel Chiva", Assemblée nationale, 4 December 2024 [online].

48% of defence employees indicating a lack of engineers[36]. In addition, according to the Association of European Aerospace and Defence Companies, the number of jobs in the defence sector increased by 8.9% between 2022 and 2023[37].

The increase in arms production will inevitably be limited, or at least slowed, by the number of jobs filled in the industry[38]. However, more important than the number of employees is the time taken to train them. Armaments industry jobs are often highly specialised, which limits inter-sector mobility on the one hand, and makes training time important on the other. In fact, R&D is more important in this sector, which increases the proportion of engineering jobs in companies[39]. As a result, an increase in the number of jobs in the sector is to be expected over the long term.

- **On the demand side: national budgets and specifications**

Industry's dependence on government orders and export

The defence industry only supplies war materiel to governments. It is therefore dependent on public orders. Without going back over the comparison made earlier between budgets at the end of the Cold War and those of today, it should be remembered that the industry has been reduced to the level of strict sufficiency in relation to decreasing demand in order to retain as many skills as possible. Thus, it will take some time before the industrial base can be rebuilt through public procurement

In addition, there is a risk associated with this adaptation. The assurance of regular orders over the long-term limits associated risk of increasing production capacity, as the industrial tool is guaranteed to be profitable. Similarly, the predictability of demand is key to adapting production capacity, even downwards. However, at the level of the defence industry as a whole, the issue of risk-sharing between governments and industry in terms of the costs associated with industrial adaptation is crucial. Both public policy and industry will bear the costs of moving from a just-in-time approach to one based on mass production, if this is indeed the government's objective. The question of risk-taking by industry and public support lies at the heart of the war economy. Moreover, this is why arms manufacturers are asking governments for orders to enable them to adapt: they cannot expand their production

[36] Joel Forrester, "United Kingdom's defence sector at risk of falling behind other countries as the STEM skills shortages rage on", Insights, Guidant Global (2024) [online].
[37] "Facts & Figures", Aerospace, Security and Defence Industries Association of Europe, 2024 [online].
[38] "Challenges of Ramping-Up Defence Production Capacity", ASD Position Papers, Aerospace, Security and Defence Industries Association of Europe (ASD), August 21, 2023 [online].
[39] Caroline Krykwinski, Mikaël Butterbach, Jean Belin, "Les ressources humaines dans le domaine de l'armement : quels enjeux et quelles réponses associées ?", *Les entretiens de l'ECODEF #8* (IHEDN, 2024) [online].

facilities and manufacture without funding, unless they go into debt with the uncertainty of being able to repay.

Finally, we might mention the dependence of some major European manufacturers on exports. Exporting enables large production lines to be maintained when the European market is historically too small, or when there are too many competitors in a given segment. This dependence creates risk for industrial production. What is more, if the government were to prioritise contracts for its own needs in the event of a crisis or change of policy, the greater the dependence on exports, the greater commercial and reputational risk for the manufacturer.

Regulations and standards

The DITB is obviously subject to the same regulations as other industries, including social, environmental and safety provisions. Faced with an accumulation of civil, military, national, European and global regulations, certain requirements of wartime economy in terms of both production time and integration into forces are undermined – which has an impact on the problems of private funding mentioned earlier[40]. One of the best-known examples is the use of drones in European airspace. As these aircraft fly over residential areas and mix with commercial aircraft, their qualification period has been significantly extended. Another example is land vehicles, which, if they want to drive on a civil road, have to comply with all the traffic, weight, performance and height standards for light signals, etc. Military vehicles are produced in much smaller numbers than civilian vehicles, but they still have to comply with several of the same standards as civilian vehicles, which increases their relative cost.

Environmental regulations are also a major constraint on increasing the production of war materiel[41]. However, this type of equipment contains many chemical substances that are highly polluting and dangerous to human health. It therefore seems difficult to lower the thresholds for the emission or release of hazardous materials, at least in European societies.

For example, Ukraine has drastically disregarded all regulations in order to cope with the war and allow maximum production with maximum subsidiarity and localisation throughout the country. However, the longer the war goes on, the more the Ukrainian army must face up to security imperatives, which is why they are reinstating certain rules *a posteriori*, particularly those of NATO for the interchangeability of equipment supplied.

[40] "White Paper for European Defence - Readiness 2030, European Commission, High Representative of the Union for Foreign Affairs and Security Policy, 19 March 2024 [online].

[41] Emmanuel Estève, "Anticipating and raising awareness: taking environmental standards into account in the defence industry", *Research Note* 136, (IRSEM, 2025) [online].

In addition, the uneven standardisation (harmonisation of technical requirements) of equipment in Europe increases the delivery time to armed forces[42]. States have their own methods and standards for qualifying equipment for use, but not all NATO standards are applied to all equipment. On the one hand, this makes it more complex for a manufacturer to supply several states that do not have the same requirements for the same type of equipment, and on the other, some countries have not wanted to apply NATO standards so as not to disadvantage a national manufacturer that applied different standards.

Finally, the European trend towards increasing military requirements, with demands for high-tech equipment, has increased production time and costs, including for artillery ammunition and missiles, which in the context of a high-intensity conflict would qualify as consumables[43]. Here, the tension between quantity and quality, or mass and high technology, becomes apparent if we want to increase the rate of production, especially of equipment that is frequently consumed and therefore ordered. The technologization of war materiel has also contributed to the lengthening of the supply chains mentioned earlier.

Tensions between time and sovereignty

- **The dilemma between long-term industrial needs and short-term threats**

Increasing arms production today would therefore require substantial industrial restructuring, which can only be achieved by increasing national orders in the first instance, and which cannot be immediate given the tensions in supply chains, the shortage of human resources and the need to maintain control standards. Thus, an economy that is prepared for war (3) will take time to develop, at least as long as it has taken to deconstruct since the end of the Cold War and will depend on the effectiveness of state and European policies.

Therefore, to produce rapidly and sustainably over the long term would require a policy that can only be effective in the long term. Is there not a dilemma between the widely shared political will in Europe to acquire equipment quickly, given the scale of the threat, and the need to build up the capacity of European industry? What seems certain is that in five years, we are going to war with the weapons of today.

The time elapsed between the order and first use of the equipment in the forces can vary according to a number of factors: the equipment has to be developed or is already in production, it is available in stock or has yet to be produced, the administrative and legal

[42] Anonymous interviews conducted by the author.

[43] Olivier Dujardin, "Peut-on encore passer en économie de guerre?", *Note renseignement, technologie et armement* n°58 (CF2R, 2023) [online].

process for purchasing the equipment is more or less lengthy, the resources take more or less time to be brought together to produce the equipment (security and speed of supply), the way in which the government finances the purchase, and so on. However, given the limits to the increase in production in Europe mentioned above, the traditional acquisitions outside Europe by Europeans and the difficulties of the EDTIB thus caused, the quickest purchase may have been outside the continent[44], in countries that had retained a significant production capacity[45]. Did speed of acquisition take precedence over other factors in preparing for war?

- **Buying off the shelf**

One reflex might therefore be to favour the acquisition of off-the-shelf equipment, which needs no development time and, ideally, with a reduced current production time, or even available in stock with the available infrastructures. This policy would therefore favour manufacturers who have reduced their production capacity the least or who have benefited from sufficient orders over the last thirty years. Thus, should governments reduce their R&D budget in favour of their procurement budget if they want to have the capacity available as quickly as possible? Are time and visibility by their very nature contradictory with war? To take the provocation even further, are predictability and long lead times a luxury in peacetime?

However, in the event of a conventional confrontation involving numerous losses of equipment, will the number of units be sufficient and, if not, will the States be able to place new orders, including for spare parts? Here we can quickly see the limits of the strategy of purchasing far from national borders to really deal with the threat envisaged. Thus, the sovereignty of production would be a key element of wartime economy, despite the urgency.

Nevertheless, off-the-shelf purchasing in itself would not appear to be disqualified. Buying on the European continent from partners who are part of the same military alliances makes sense. For this to happen, we would need to start mass ordering from European manufacturers now, in order to meet the objective of ensuring that the industry is close to being able to switch to a wartime economy (4) when it comes. Thus, off-the-shelf ordering of European equipment, even if it will not be delivered for several years, would seem to be an unavoidable way of moving from 2 to 3, but also from 3 to 4. Buying non-European equipment on the assumption that it will be delivered more quickly would in fact be counter-productive for a potentially effective wartime economy. To put it even more strongly: the long term would be the best short term there is.

[44] Jean-Pierre Maulny. "The Impact of the War in Ukraine on the European Defense Market (IRIS, 2023) [online].
[45] Maïté Bol, Yannick Quéau, "L'autonomie stratégique européenne au prisme des importations croissantes d'armes américaines", Publications (GRIP, 2024) [online].

- **Licensed production**

Despite the current difficulties in putting this part of the agreement into practice, Poland has negotiated that some of the equipment it has purchased from South Korea should be produced on its own soil, precisely in order to have the capacity ensure long-term operational readiness and develop its DITB[46]. Producing foreign equipment on its own soil is therefore the first stage in the "polonisation" of its equipment. In this case, short-term relocation would only be for R&D, with a view to developing its own equipment in the future. In another example, Germany will produce American air defence missiles on its own soil, without any specific technology transfer[47].

Would the production of foreign equipment under licence be a lever of wartime economy, in the absence of production of this equipment in Europe? The potential limitations of producing under licence relate to two main factors: the ability to adapt the system produced according to the hazards and lessons learned from war, and the ability to use freely the equipment. In terms of these two elements, licensed production of foreign equipment does not appear to be optimal but is theoretically possible under these conditions in a wartime economy. Poland has obtained such possibilities with South Korea, with the exception of re-export. Without such an agreement, the state becomes *de facto* dependent on the R&D of another in order to continue to be superior to its adversary other than through its methods of using force. This dependence can prove risky, as the original state may change alliance or prioritise its national needs, for example. Finally, while R&D accounts for most of a system's production time, industrialisation needs to be organised, and the factory staffed. This is precisely what Europe has lacked, and the industry still needs to be rebuilt, which will take some time. Consequently, licensed production could be one of the means of wartime economy, but not the only one, and only temporarily.

As with off-the-shelf purchases outside Europe, it would seem that the European states cannot enter a war economy (4) without a policy of war preparation (3), which in any case will take time. Sovereignty of production in Europe seems to be the condition for the effectiveness of a war economy policy at the most advanced stages.

[46] Louise Souverbie, "La stratégie de réarmement et de montée en puissance industrielle de la Pologne dans le contexte de la guerre en Ukraine" (IRIS, 2023) [online].
[47] "Germany Enhances Patriot Missile Production Capacity With New MBDA Facility in Europe", *Army Recognition*, November 19, 2024 [online].

PREPARING FOR WAR: PLANNING FOR THE LONG TERM AND PREPARING FOR THE SHORT TERM

Preparing for war requires a long-term industrial policy to adapt production facilities and armed forces sufficiently to withstand the first shock. This anticipation over a relatively long period seems unavoidable if the industry is to achieve the capacity to go from 3 to 4 quickly. The need could be summed up by the following formula: the best short term is the long term.

However, the short term – urgency – can also be anticipated: governments must be able to adapt as quickly as possible, but also to support the adaptation of society as a whole during wartime.

State programming

- **Segmentation of needs to reconcile visibility and adaptability**

We have seen that development times in the defence sector are long and that preparing for war requires this long time, despite the urgency. Nevertheless, given the level of threat to Europe, we could put forward a hypothesis that would enable us to reconcile the short and the long term. We would have two types of need: the first corresponding to high-technology equipment requiring a long development period financed by the States, the second corresponding to less complex or even *low-cost* equipment, without long-term state investment.

According to J. Droff and J. Malizard, there are two different defence markets[48]:

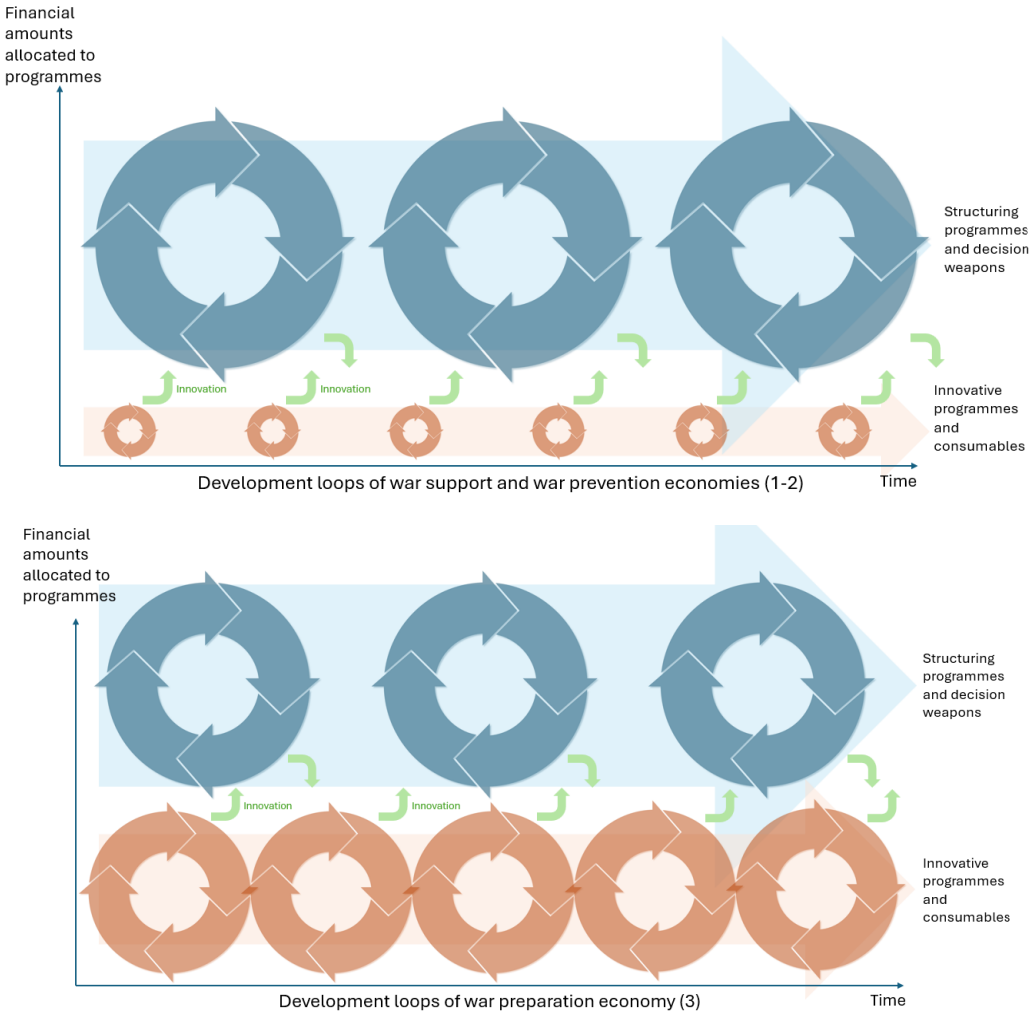
- A "historical" market, made up of goods developed over a long period of time, with a strategic military effect, and for which there are few industrial competitors, etc.
- As well as an "emerging" market, made up of goods developed and adapted rapidly, "consumable", of industrial initiative, more often of a dual nature, with strong competition, etc.

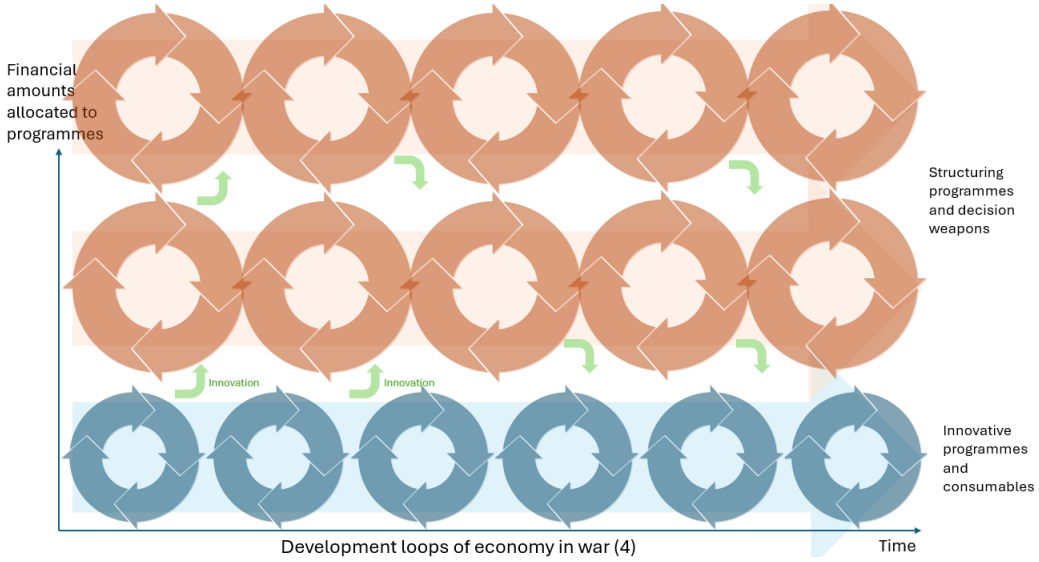
The former would include naval vessels, piloted fighter aircraft and ballistic missiles, while the latter would include artillery munitions, drones and robots, as well as cyber defence solutions and algorithms. The two markets and the two types of products would thus be complementary.

[48] Josselin Droff, Julien Malizard. "Evolution of conflicts and reconfigurations of the arms industry: the two markets hypothesis", *Défense et Industrie* n°18 (FRS, 2024) p.28 [online].

If we extrapolate this hypothesis, it could indicate the need to differentiate the development and acquisition processes for these two types of products to gain mass on consumables and maintain technological excellence on so-called "decision" weapons. This would make it possible to clarify the objectives of national industrial policies, concentrate resources and thus reconcile the short and long term in a phase of economic preparation for war (3). In addition, this would enable the state and companies to adapt more quickly to war economy (4), during which rapid acquisition must be the norm. Finally, increasing the rate of production of consumable solutions, in the case of ammunition in particular, would create stock, a significant factor in the transition to a wartime economy, as we will discuss later. We can visualise the different stages of wartime economy in the simplified way below.

Diagram 2: Hypothesis of changes in the nature of armament programmes as a function of the level of wartime economy





Source: Author

At the first two levels, long-term programmes would be the norm. Defence innovation is certainly considered, but it represents a small part of the national budget and concerns technologies that will be mature within a decade. There are few short-term programmes. This is the situation in most European countries today. The assumption here is that we need to develop short-term programmes for a range of military equipment and solutions in order to prepare for war (3), while maintaining long-term structural programmes.

Nevertheless, should governments publish the list of capabilities for which they expect developments from one or the other? Should they allow the market to divide up naturally? Division by the state has the merit of clarifying demand so that supply can adapt, which is the classic order of process in the defence market. But the emerging market could itself propose innovative solutions that are sometimes more competitive and more effective for armed forces. It would therefore seem that governments should propose their vision on a case-by-case basis and create links with the market so that the latter can adapt as closely as possible to changing needs.

Finally, should wartime abandon weapons of decision? This is not obvious. On the contrary, the history of war shows that the development of certain so-called breakthrough technologies has been the subject of real scientific races, such as military nuclear technology, or missiles during the Second World War. Similarly, Ukraine has announced that it is adapting its *Neptune* anti-ship missile so that it can hit land targets at 1,000 kilometres[49], a capability that the

[49] Illia Kabachynskyi, "Ukraine's Upgraded Neptune Missile Now Strikes 1,000 km-Built in Record Time", *UNITED24 Media*, March 17, 2025 [online].

Europeans are also trying to develop, albeit on a much longer timescale[50]. Thus, although mass may seem to be the priority in war, technology remains an issue in the balance of power. It would therefore be better to allow innovation and feedback from the field to penetrate the development processes for this type of weapon, to speed up the process of bringing it to maturity and thus bring a breakthrough to combat, rather than being subjected to it.

- **Acquisition process and integration of innovation**

The acceleration of the acquisition time seems crucial for the transition from 2 to 3 and facilitates the transition from 3 to 4 insofar as the armed forces would have the appropriate equipment and the mass necessary to face the first shock. In wartime, the speed of acquisition is more vital, but its nature would change (legal frameworks would be greatly relaxed, state dirigisme at its maximum, etc.), which is why we are concentrating here on preparing for war.

Following on from the hypothesis mentioned above, the 'emerging' market is made up of equipment from sectors with relatively short innovation cycles. Cyber defence is a striking example of this, as malicious solutions are constantly being updated, and defence solutions need to keep pace to ensure they are always up to scratch[51]. It is crucial to have a more flexible and rapid acquisition process in this type of area. This could also be the case for mini drones, which make increasing use of artificial intelligence, and which are now on offer in abundance: it could be in an army's interest to buy several types, even if it has to sell them later to buy new ones, both for their digital and consumable nature[52]. What needs to be bought in large quantities can only be bought at a lower cost, because their lifespan will be short in wartime, especially if the war is fought over a long period[53] . States should therefore adapt to differentiated acquisition processes.

In this emerging market, governments should also strengthen their strategy of incorporating civilian innovations into their programmes. Bearing in mind that the defence sector is a relatively small economic sector, most of the funds earmarked for research and innovation come from funds targeting solutions that are not exclusively military, or even non-military (drones, algorithms, etc.). For example, the EU has a budget of around €100 billion over seven years for innovation in general, and the European Defence Fund, which finances defence R&D projects exclusively, has a budget of €8 billion over the same period[54]. Without even ensuring

[50] Timothy Wright, "Europe's missile renaissance", Online Analysis (IISS, 2024) [online].
[51] Neil Robinson, "Keys to successful investment in cyber defence", *NATO Review*, 6 April 2017 [online].
[52] Thomas X. Hammes, "Small, smart, many and cheaper: Competitive adaptation in modern warfare", *Atlantic Council Turkey Programs*, June 24, 2024 [online].
[53] Thomas Hamilton, *Expendable Missiles vs. Reusable Platform Costs and Historical Data* (RAND Corporation, 2012) [online].
[54] Taking into account Horizon Europe, the Digital Europe Programme and the budget of the European Institute of Innovation and Technology.

that defence should have a larger common budget, the civil innovation thus promoted should be able to feed into defence R&D. Thus, for certain capabilities, it could be in the interest of governments to harness this innovation for military purposes. However, they must have the capacity to do so and accept an additional share of risk in the acquisition of equipment that may not correspond 100% to military requirements because it has been developed in another framework, in order also to gain in speed of acquisition and use. France's Defence Innovation Agency[55] and the United Kingdom's Defence Science and Technology Laboratory[56] have programmes to achieve this.

In addition, the armed forces should be constantly testing solutions currently under development to accelerate their maturity and ensure that they meet military requirements. Once again, the example of drones speaks for itself. It is useful for the armed forces to test many different drones in order to refine the offer from manufacturers, and for the latter to test their products in conditions that are sometimes difficult to achieve outside specific environments, particularly in the maritime and space sectors. It also brings smaller players closer to the armed forces, who can be in closer contact with the big incumbent companies. The innovations of new entrants thus have a chance to put their products to the test and have a greater chance of being acquired by the armed forces *in the end*. Finally, when it comes to artificial intelligence, experimentation in a military environment allows models to be practised or to acquire data that is inaccessible under normal circumstances. One example is the REPMUS 24 exercise, which tested robotics solutions in a NATO context[57] . European manufacturers are also very interested in testing their products in Ukraine[58].

We can also raise the question of business model: for certain types of equipment, is rental preferable[59]? Indeed, leasing would mean spending less public money if the equipment were only partially or temporarily used[60]. The rental period would allow armed forces either to refine their requirements in order to consider a future acquisition, or to temporarily increase their capacity. However, the benefits of this model could be limited in wartime. In the field of strategic transport, for example, private players, of which there are currently only a few, could refuse to lease their resources in the event of war, to avoid exposing themselves to reprisals from the customer's adversary, or even to avoid risking the destruction of the platform.

[55] "The Agency's missions", *Defence Innovation Agency*, Ministry of Defence [online].
[56] "About Us", Defence Science and Technology Laboratory, GOV.United Kingdom [online].
[57] "NATO's Digital Ocean Initiative gets a boost in Portugal", *NATO News*, September 9, 2024 [online].
[58] Joe Saballa, "Finland Sends Advanced Weapon Prototypes to Ukraine for Combat Testing", *The Defense Post*, June 11, 2024 [online].
[59] Renaud Bellais, "Public-Private Partnerships and the Transformation of Defence Investment", in *The Evolving Boundaries of Defence: An Assessment of Recent Shifts in Defence Activities* (Emerald Group Publishing Limited, 2014) pp. 25-49.
[60] Carlton L. Hensley, Archie L. Tinjum, "Lease vs. Purchase in Defense Acquisition" (Naval Postgraduate School, 2008) [online].

Leasing could therefore be a way of increasing military capabilities tenfold in times of war preparation, when the deterrent aspect still counts, but not in times of war, or far from the front line.

- **Building up stocks**

Moving from a time of preparing for war to a time of war also means cushioning the first shock of confrontation before the state apparatus and society adapt and react. To this end, it is essential to build up industrial and military stocks. What is more, while production facilities are not yet at the stage of *economy in war*, the stocks available must enable industry to mass-produce quickly for the war effort.

There are several possible types of stock. The first is stocks of raw materials, which in Europe are imported in large quantities from other continents, as are sub-components[61]. International supply chains will be widely targeted by adversaries or redirected by other players to meet their own needs. This means that the major industrial prime contractors will have to place substantial orders with their subcontractors. In the United States, for example, the National Defense Stockpile (NDS) was established by the Strategic and Critical Materials Stock Piling Act to accumulate and conserve materials essential to military and civilian needs[62].

However, companies' stocks have a cost: they represent production that is not sold, or components that are not yet valued as finished products, to which are added the costs of securing and even maintaining them. The state can therefore develop policies to reduce the cost of these stocks. In particular, it can order more finished products than it needs - which would also influence production capacity and the unit cost of the product - ready for use by the armed forces in the event of war, in particular consumable equipment from the emerging market such as munitions and drones. It would also bear the cost of storage.

Conversely, state can force companies to build up stocks, as has been the case in France since the last military programming law for components[63]. Moreover, this policy is not only to the detriment of companies, because in view of the increase in demand, these stocks can also become competitive advantages by speeding up their delivery times. What's more, the government could act as a "wholesaler", if it owns the stocks itself and sells them to several

[61] James Hackett et al., "Critical Raw Materials and European Defence" (IISS, 2025) [online].
[62] Louise Souverbie, "The U.S. Industrial Defense Strategy after Ukraine", (IRIS, 2024) [online].
[63] The components covered by article 49 of the French military programming law are "[...] strategic materials, components, spare parts or semi-finished products". LOI n° 2023-703 of 1 August 2023 relating to military programming for the years 2024 to 2030 and containing various provisions concerning defence. [online].

suppliers, including civilian ones. This could improve the competitiveness of companies, while giving the state a means of industrial policy.

- **Sharing the risk between State and industry**

The question of risk-sharing is crucial. Intrinsically, the production of war materiel is risky (the materiel can - indeed must - lead to the death of human beings, the industry is in itself a means of waging war and thus a target for the enemy, etc.). What is more, there is a high level of R&D in the sector, although this does not always lead to profitable production. Finally, the state is the only customer for equipment that can determine its very existence. Therefore, a balance of risk-taking needs to be struck between governments and companies to ensure that supply matches demand. However, as the time of war draws nearer, the risk increases, as does the need for the state. The latter must therefore ensure its supply by becoming more involved in industrial production.

Thus, is the nationalisation of defence companies a way of preparing for war? It would seem to be the surest way for the state to ensure that the company produces what it wants, assuming all the risk, for a defined period, although cost would be significant. In addition, the Managing Director of KNDS France has proposed the creation of reserve plants, owned by the state, which companies could use in the event of a drastic increase in demand[64]. This brings us back to the issue of risk-sharing between governments and companies in the war economy. The state could be asked to assume part of the initial investment required to increase production, particularly in terms of infrastructure. This is not a financial instrument, but a lever to reduce the cost of the war economy for companies.

Security of supply and resources

- **Supplies**

It is clear that globalised supply chains will put a strain on wartime economy. The objectives of an economy prepared for war should therefore be to limit these risks as much as possible. There are two main ways of doing this: relocating to Europe and securing supply routes.

Defence manufacturers should eventually succeed in mapping their supply chain so as to repatriate the production of the most critical components to Europe, as close as possible to the production of the finished product, as some are beginning to do[65]. This industrial mapping

[64] Vincent Lamigeon, "Des usines d'armement activables en quelques mois : la proposition choc du patron de KNDS France", *Challenges*, 24 February 2025 [online].
[65] Tristan de Vasselot, "MBDA : le colosse européen des missiles accélère la cadence pour répondre à la demande", *Dividendes*, 21 March 2025 [online].

effort would also make it possible to identify certain SME in order to convince them - or force them - to create production lines dedicated to defence, if demand is assured. Relocation is a security imperative, but it comes at a cost: the cost of the initial investment may be substantial, but governments would also have to bear the cost of labour, which is relatively more expensive in Europe than on other continents, and state dirigisme in industrial production must go hand in hand with security in ordering - at the risk of it being unsustainable for companies.

As for the security of supply routes, this has been identified by European states for longer. The Strategic Compass, for example, clearly states that ensuring freedom of navigation in common areas (air, sea, space) is a vital issue[66]. However, military operations to secure maritime traffic, through which most world trade passes, have a significant cost for European states. This policy should make it possible to ensure most supplies in time of preparation for war but will be limited in time of war. Relocation would therefore be the most effective long-term policy.

In addition, regulatory measures could have an impact on security of supply, especially at the European level[67]: developing framework agreements to facilitate joint purchasing, building up strategic stocks as mentioned earlier, strengthening partnerships with like-minded third countries to diversify sources of supply and share best practice, etc. In addition, the question of a priority ordering mechanism arises, at least for wartime, to ensure the supply of defence equipment, as proposed in EDIS.

Nevertheless, the question of the viability of supply chains for raw materials, electronic components and chemical inputs arises in wartime, and even before when states restrict the export of certain goods or increase their customs duties. Thus, it would seem that an important means of wartime economy is to reduce dependence by developing war equipment that is more frugal in terms of materials and less numerical[68].

- **Human resources**

Providing qualified human resources for the armaments sector requires a genuine interministerial policy to make the sector attractive (including financially), to guide young people and to create training courses[69]. State and industry must work together to create a professional and scientific ecosystem, starting with secondary education.

[66] "A strategic compass for security and defence", Council of the European Union, 24 March 2022 [online].
[67] Daniel Fiott, "Security of Supply: How Can the EU Help Ensure Defence Preparedness?", CSDS Policy Brief, CSDS, September 3, 2024 [online].
[68] James Hackett et al., "Critical Raw Materials and European Defence" (IISS, 2025) [online].
[69] Caroline Krykwinski, Mikaël Butterbach, Jean Belin, "Les ressources humaines dans le domaine de l'armement : quels enjeux et quelles réponses associées ?", *Les entretiens de l'ECODEF #8* (IHEDN, 2024) [online].

There are other ways in which companies can internalise the training of certain employees whose qualifications are too specific to create an external training programme. For example, *Airbus* has a vocational high school to channel young people into the company with the development of skills that will be useful to it[70].

Emerging technologies can also significantly speed up both production and training. Artificial intelligence should increasingly automate functions, which can reduce the need for human resources[71]. In addition, the development of virtual reality and simulation tools needs to be significantly stepped up, not only to speed up training time but also to enable greater employee mobility both within and outside the armaments sector.

Finally, reserve systems should be generalised. A map of skills relevant to defence should be drawn up so that people with these skills can be employed in wartime economy. Employees from other industrial sectors should be able to sign up with national organisations or armament companies to do a few weeks' work each year. This may simply supplement short-term production capacity, but it also paves the way for the mobilisation of civilian sector employees in the event of war. In the same vein, promoting the retraining of staff and factories in other sectors (metallurgy, pyrotechnics, automotive, etc.) could help to meet the sudden increase in demand. The reserve is for volunteers, but if the crisis hits, all workers could be called upon to contribute to war effort.

- **Financial resources**

Financial innovation is also necessary for wartime economy[72]. Mobilising individual private savings seems an interesting lever for this, with, for example, the creation of savings books dedicated to the European defence industry[73]. Similarly, insurance funds should be used to target these companies in order to create sufficient leverage. In addition, the social acceptability of this type of measure is an issue that needs to be addressed by governments. However, private funding is a complementary means to facilitate innovation and enable long-term investment by large companies. Public funding necessarily accounts for the largest share of the financing required for the industry to grow.

[70] Lycée Airbus website [online].
[71] Tyne Phillips Mocek, "AI plus upskilling could help solve labor shortages, leaders say", *Axios*, January 22, 2025 [online].
[72] Joseph Votel, Francis Finelli and Samuel Cole, "Leveraging U.S. Capital Markets to Support the Future Industrial Network", *War on the Rocks*, January 11, 2023 [online].
[73] Benoit Van Overstraeten, "France to launch 450 million euro defence fund amid growing security concerns", *Reuters*, March 20, 2025 [online].

Governments must remove the obstacles to bank investment in the DTIB[74]. Although the question of reputation and criteria of social and environmental responsibility play a part in the risky nature of these companies, other criteria could be considered without diminishing the importance of the former, such as criteria of "sovereignty" or "security", in order to allow a better valuation of investments. At the same time, however, governments can assume an additional share of risk by guaranteeing loans, for example.

Nevertheless, one way of going further and faster could be to create a genuine fiscal specificity for the defence sector. Companies recognised by governments as part of their DTIB should benefit from significant tax advantages. The advantages would be as follows:

- Reduce the cost and selling price of equipment and become more competitive on international markets, thereby promoting exports.
- Lowering the barriers to entry into the sector would enable companies that do not specialise in defence to consider developing a business for this purpose, particularly SMEs.

This deregulation policy could create a shock enabling companies to free up financing. Nevertheless, it is a policy that may prove complex to implement in large welfare states, because of the drop in revenue, at least in the short term, and the breach in equality between companies that it would imply.

Simplifying specifications and leveraging standards

- **Simplifying specifications and standards**

During the decades of the peace dividends, performance was often considered the most important criterion compared with cost and delivery time, in order to maintain key skills within the DTIB. This has shaped industry, which is designed for high-tech rather than mass production. Thus, one of the ways of helping the industry to move towards mass production that can be adapted to wartime more quickly is to partly limit the military's requirements of performance. Reducing these would require a significant effort from armed forces, but it would give them greater flexibility in the use of capabilities, since they would have several complementary tools that could be adapted at any given time and more easily replaced in the

[74] Sam Fleming, Paola Tamma, Anne-Sylvaine Chassany, "The options to fund European defence", *Financial Times*, February 27, 2025 [online].

event of unsuccessful feedback[75]. Military specifications are therefore a real challenge for wartime economy.

In addition, as mentioned above, some countries do not apply all NATO standards, giving priority to their own, and therefore have to qualify equipment using their national standard. Harmonisation – and simplification – of standards is therefore a major objective of collective defence to save time between order and delivery, but also to promote interoperability and interchangeability, as EDIS points out.

In general terms, deregulation in all areas, and concerning both the market and procurement, is a lever used drastically by warring states. Nevertheless, certain standardisation norms may be crucial to maintain in order to ensure the interoperability and interchangeability of equipment.

- **Simplification of certain regulations applying to production in general**

The adaptation of regulations, whether national or international, is also an issue in preparing for war. The example most often cited is that of European and often environmental regulations, which have sometimes forced manufacturers to find different processes. The EU has become aware of this issue and has recently proposed plans to simplify regulations for companies[76]. In the defence sector in particular, the European Commission is due to submit a proposal to the Member States in June 2025[77]. More generally, Member States must work with industry to examine the ones that are holding back production, those that could be abolished and those that the defence industry could derogate from by exemption and find a balance that is acceptable to society. Although many standards may be disregarded in times of war, the issue must already be addressed today for the new productions of the defence industry.

- **The normative leverage of a strategic state**

Legal provisions must be put in place in advance to manage the crisis should it arise. In this way, state can urgently adapt production to a particular need. However, by providing for mechanisms of constraint to be activated according to the risk, state interventionism in the

[75] Fabrice Wolf, "Les drones TB2 Bayraktar désormais "inutiles" en Ukraine face à la défense anti-aérienne russe", *Meta-Defense*, 22 June 2022 [online].
[76] "Simplification: Council adopts position on suspensive mechanism to strengthen EU competitiveness and provide legal certainty for businesses", Press release, Council of the European Union, 26 March 2025 [online].
[77] "Consultation to contribute to the Defence Omnibus Simplification Proposal", European Commission, March 25, 2025 [online].

economy can be gradual, which means that not all the levers of an economy at war can be used for the preparation time.

As mentioned above, depending on tensions over certain materials, the risk of a conflict breaking out or the anticipation of an exponential order, the government could force the industry to build up stocks.

Another important constraint would be for the administrative authority to prioritise its orders, or to give priority to supplying the defence industry, as proposed in EDIS. This could involve finished products, but also components to direct production from the civil sector to the defence sector.

Requisition is another means. Most countries already have regulatory frameworks for organising requisitioning, particularly in times of civil crisis, for medical equipment, for example. Compensation mechanisms often accompany requisitioning. It may involve the delivery of equipment to the armed forces, or the provision of a service. A wartime tool, it must be anticipated to be effective if activated during a crisis.

Resilience: preparing to resist, react and adapt

In this section, we look at the elements that contribute to the resilience of wartime economy, i.e. what facilitates the first defence of public and private organisations in the face of shock, as well as their reaction, with as little disruption as possible to customary practices and with as much subsidiarity as possible within society. Wartime economy also has an important societal dimension.

- **Resilience, mobility and protection**

At the same time as taking on mass, the armed forces should be more capable of maintaining equipment in operational condition, repairing it and even upgrading it, all as close as possible to the theatre[78]. The concept of resilience can illustrate what we need to achieve here: the ability to adapt quickly, to re-use damaged equipment with or without its full capabilities, etc. Platform architectures must take this imperative into account if they are to survive war. The concepts of recycling and second-hand equipment are therefore not too far removed from the subject of wartime economy.

Additive printing is also a key technology to adopt in order to simplify the production of relatively simple spare parts, even in theatre, and thus facilitate the maintenance of

[78] "Le maintien en condition opérationnelle, priorité de la LPM 2024-2030", News, Ministry of the Armed Forces, 20 April 2023 [online].

platforms[79]. Manufacturers should therefore design their platforms so that as many parts as possible can be reproduced using this technology. The capacity to produce small equipment such as drones should also be considered, as some solutions are proposing through a trailer for a land vehicle[80].

These ideas are tantamount to saying that production should be brought closer to employment. However, in the past, European armed forces have outsourced more of their support functions to industry. Today, armed forces should analyse which functions it would be preferable to reinternalise, in order to save maintenance time and gain logistical autonomy for deployments[81]. However, this idea has significant consequences in terms of human resources. The links between the industrial reserve and the operational one could be explored in order to envisage the deployment of industrial reservists.

Making transport routes as fluid as possible is also a factor in the resilience of wartime economy. What is known in Europe as military mobility is about moving forces quickly but also in numbers. Much work remains to be done in this area, given the densification of the European transport network and trade flows[82]. Preparing for war therefore means preparing the ground for the intensive movement of war materiel in order to ensure continuous supplies for the armed forces. This policy of anticipation is all the more important as the infrastructure work to be carried out is substantial and costly. We can imagine, for example, that certain factories producing consumable weapons will have to be – once again – connected to rails. Adapting the transport network is a major factor in ensuring the transition to wartime. Manufacturers in the mobility and logistics sector must work alongside governments to analyse the suitability of infrastructure for war, while making provision for redundancy – the key to resilience. This is also a focus of the European White Paper[83].

In addition, security is becoming more important for the DTIB, which is becoming a priority target to hit, and is already increasingly so today[84]: the protection of companies, both tools and people, should therefore be considerably strengthened, as should the capacity of

[79] David González, Almudena Álvarez, "Additive Manufacturing Feasibility Study & Technology Demonstration" (European Defence Agency, 2018) [online].
[80] "PER SE SYSTEMS: About", LinkedIn [online].
[81] Dominique de Legge, "Maintien en condition opérationnelle des équipements militaires", *Information Report No. 4 (2024-2025) of the Senate Finance Committee*, 2 October 2024 [online].
[82] "Action plan on military mobility 2.0", European Commission, High Representative of the Union for Foreign Affairs and Security Policy, 10 November 2022 [online].
[83] "White Paper for European Defence - Readiness 2030, European Commission, High Representative of the Union for Foreign Affairs and Security Policy, 19 March 2024 [online].
[84] Yohan Lemaire, "Guerre en Ukraine : "Une campagne de sabotage d'une témérité stupéfiante..." Comment les Russes multiplient les actes malveillants", *La Dépêche*, 3 December 2024 [online]

intelligence services to counter sabotage attempts of all kinds and generally ensure defence security.

Finally, energy and communications issues must be at the heart of efforts to strengthen the DTIB. On the one hand, energy security is crucial as a vitally important sector[85] . On the other hand, energy consumption by industry is a significant part of a country's consumption, and growth in production capacity will increase this. Increased energy production is therefore an element of wartime economy. Nevertheless, Europe finds itself in a complex situation, still very dependent on imported hydrocarbons. Europe-wide energy planning is therefore essential if we are to make the transition from 3 to 4 rapidly. Finally, in terms of communications, it is the ability to hybridise networks, i.e. to use civilian networks securely rather than creating new ones, that will make the economy and the war effort resilient.

- **Tests and exercises**

We have already mentioned the idea of bringing innovation closer to military users, so that they have innovative equipment more quickly, as well as adapting solutions of civilian origin for military use. Tests must be ongoing, as must exercises.

But the exercises can also involve industry. Governments should organise stress tests, as well as civil-military crisis management exercises to determine the ability of manufacturers to be ready to increase production rapidly. Feedback from such exercises would benefit both industry and governments, enabling them to focus their efforts on the most serious problems. This type of exercise is often carried out in many sectors of vital interest (health, transport, security, etc.) and helps to create a common environment between organisations. Internal security forces have their part to play in facilitating wartime economy, for example.

Furthermore, at the European level, systematic stress tests could be introduced to evaluate and measure the defence industry's resilience to a sudden surge in demand. Such an approach would have the added benefit of pinpointing critical vulnerabilities and bottlenecks over time.

- **Preparing the civilian sector**

We have also already seen how innovation in the civilian sector and various other players (transport, homeland security, the energy sector, etc.) had to play their part in wartime economy. More generally, in wartime, the so-called civilian sector will be heavily mobilised to participate in the effort. Industry in every sector should be prepared for this eventuality. Useful industrial capacities should be mapped out and war adaptation plans prepared for

[85] "Energy security", NATO, 11 January 2024 [online].

them. Orders from defence industry and government would be prioritise. We also need to prepare companies that can more or less quickly produce weapons in place of what they usually produce. The idea here is to anticipate the state's interventionism in wartime, without putting in place all the levers until it is time. In addition, the companies identified should be included in the tests and exercises mentioned above. Nevertheless, given the interconnectedness of the industrial fabric in Europe and the equipment acquired by Europeans, coordination of this type of effort at European level would seem necessary.

CONCLUSION

Summary

The term of wartime economy is a political one, and the move away from war in Western societies over the last thirty years has resulted in the creation of a rupture: the awareness of the return of war to Europe, and thus of the need to adapt the defence economy to this new reality. This is why we have proposed a division of the notion into four phases, without deconstructing it. The political vision of an economy of war can thus be understood as a vision of anticipation of the "real" war, and therefore of its preparation.

We have therefore outlined the four possible stages of a war economy:

1) Supporting the ally over the long term - *the war support economy*.
2) Consolidate the defence architecture corresponding to the perception of the right level of threat - *the war prevention economy.*
3) Preparing for war - *the war preparation economy.*
4) Making and winning war - *the economy in war*.

Nevertheless, we clearly saw that the crucial policy today was to prepare ourselves to be able to make the transition from 3 to 4, while noting that the European States were still a long way from 3.

The main obstacles to implementing 3 are complex to overcome, particularly in terms of increasing the pace and quantity of production. On the supply side:

1. **Supplies**: Defence equipment production is heavily dependent on electronic components, semi-conductors and raw materials, often from globalised supply chains, which exposes the industry to risks of disruption, exacerbated by geopolitical tensions.

Subcontractors, particularly in Europe, are struggling to increase their production capacity due to weak demand and financial constraints.

2. **The workforce**: The lack of attractiveness of the defence sector is generating a shortage of skilled labour. In Europe, several thousand jobs are vacant, and the specific training of employees in this field is long and costly. What is more, the labour shortage is likely to increase if demand grows strongly and rapidly as recommended.

3. **Development time**: The defence industry operates on long production cycles, and rapid changes are difficult to implement without a gradual adaptation of infrastructures and processes.

On the demand side:

1. **Dependence on – low – government orders**: The defence industry depends exclusively on government orders, which are difficult to adapt quickly because of budgetary constraints and uncertain forecasts. Industrial capacity cannot be increased instantaneously, as manufacturers need to guarantee orders to justify their investments.

2. **Regulations and specifications**: Regulations in terms of social, environmental and safety complicate the rapid production of military equipment. What is more, European armed forces over-specify their equipment. This increases lead times, costs and makes it difficult to adapt to urgent requirements.

3. States are faced with a time dilemma: buying what exists on the market to go faster or investing in industrial capacity to produce for the long term. We have seen that in this case, the European nature of production is the fine line to find. Whether or not we buy off the shelf, the most important policy is to buy European if we want to have the right industrial tool to prepare for and support war.

Finally, what is important is the following paradigm: the best short term is the long term. Without a long-term vision and anticipation of the short term - of the emergency - industry cannot be an effective means of military victory.

Table 4 – Policies that can be implemented to prepare for war

Domain	Actions
Programming and acquisition	Differentiate the procurement process according to the need for decision weapons or consumable weapons, to be much more flexible for the latter. Develop a strategy for the penetration of civilian innovations into defence systems. Increase government orders. Build up strategic stocks of components and finished products.
Supplies	Relocate the production chains to Europe and reduce dependence on non-European suppliers. Strengthening the security of supply routes. Develop companies' knowledge of their supply chain. Anticipate components whose supply is likely to be limited in wartime to reduce dependence on them in future equipment.
Human resources	Develop the attractiveness of the defence sector. Strengthen guidance to the sector in secondary education. Create secondary schools and specialised training courses for the sector. Internalise the most vital training courses in companies, where the related skills are most lacking. Develop a national policy for using AI to increase production. Invest in simulation to speed up training times. Creating an industrial reserve.
Financial resources (excluding government funding)	Mobilising savings from individuals. Create insurance products dedicated to sovereignty or defence. Enable state-guaranteed loans. Removing obstacles to bank financing of defence activities. Establish an advantageous tax framework for defence activities.
Regulatory	Simplify the expression of military requirements and equipment specifications, particularly for consumable weapons. Simplify certain regulations (environmental but not only) and create exemptions for defence activities. Create levers to constrain companies as the risk evolves, requisitioning, stockpiling and prioritising orders.
Resilience, mobility and protection	Adapting defence system architectures so that they can be repaired as close to the theatre as possible, with spare parts production facilities. Reduce the level of digital dependency of certain materials (including *low-tech*). Mapping equipment components that can be recycled and anticipating recycling and reintegration methods. Bringing certain maintenance functions back into the armed forces.

	Develop all aspects of military mobility in Europe (infrastructure, means of transport, regulations, civil-military coordination). Linking industries to transport routes. Strengthening the security of the DTIB. Develop a policy of energy sovereignty and strengthen the redundancy of the European network.
Tests and exercises	Test not yet mature equipment by the armed forces to speed up innovation. Carry out regular exercises between government and industry to test the capacity to ramp up production. Integrating an industrial dimension into military exercises. Organise European stress tests.
Preparing the civilian sector	Prepare civilian industries to participate in the production of military equipment or equipment for military industries.

Source: Author

Cooperation as a means to wartime economy

For the sake of brevity, we have deliberately not dealt with the cooperative dimension of wartime economy here. Nevertheless, preparing for war can only really be done on a European scale. We can mention a few levers here:

- The European industry still needs to reach a larger size in order to produce more. One of the priorities is to consolidate the European offer, in particular by merging industrial groups. This will require considerable political commitment, as the economic return of armaments production is a wish widely shared by all states. A method needs to be found to reduce the number of competing players while ensuring that the whole of Europe benefits.
- One important lever is joint purchasing, which enables us to sign larger contracts with manufacturers.
- The European Union in particular has the resources and critical mass to strengthen the EDTIB and tap into new sources of funding (with the European Investment Bank, for example, or the creation of a new defence bank).
- Finally, the regulatory aspect is closely linked to the EU.

The transition to the scale of the EDTIB can only be made on a continental scale.

Furthermore, the issue of industrial – and, further downstream, capability – specialisation arises: to achieve an optimal concentration of efforts, should states divide industrial

competencies among themselves? Such an approach would imply concentrating a small number of actors within each capability segment, thereby enabling European states to place large-scale, standardised orders for the same equipment. This aligns with the notion of fostering “European champions.” However, are states possessing a significant DTIB truly willing to relinquish one of their national manufacturers in favour of another, even if European? At present, this does not appear to be the case, as the European supply landscape remains highly fragmented. Building on a point raised earlier, it is likely that substantial consolidation will be required only in long-term, high-technology production segments, whereas maintaining fragmentation could remain preferable to produce consumable equipment. This bipolar structure of European industrial policy has yet to take shape.

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