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Defending Europe: Dual-Use Technologies and Drone Development in the European Union

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DEFENCE

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Executive Summary

Since the conception of the modern state, the defence dimension, including the defence industry, has been perceived as a fundamental element of a state's sovereignty and monopoly, principally endorsed and subsidized by national governments. Nevertheless, the defence sector is subjected to globalization processes that are determining the emergence of transnational defence markets and structures, weakening the so called national monopoly over defence industries, which in turn are creating new opportunities for transnational defence cooperation. Political consensus has been developing within the European Union (EU) milieu for defence capacity-building, but pragmatic responses remain at best declaratory and weak. An agenda to fund for defence by stealth and to generate new capabilities seems to be the way ahead: through the hybridization of civilian-military R&D and by funding for dual-use technologies such as EU-endorsed Remote Piloted Aircraft Systems (RPAS). While formally remaining an intergovernmental agency under the Council's authority, the European Defence Agency's (EDA) success in implementing substantive changes remains debatable, especially in terms of building a more integrated, technologically and economically superior strategy for drone development. Costly Research & Development (R&D) and Research & Technology (R&T) investment programs for security and defence purposes have always been highly controversial, especially in terms of tapping the European taxpayers' money. The social impact of such disruptive technologies is of clear importance, especially if dual-use drones are being developed within the broader European 'public interest' to achieve the goals of citizens and maximize some larger social welfare function. What drives the backing of this recent policy agenda that what is it exactly that justifies and calls for financing and researching dual-use technologies such as RPAS?

The views expressed are only those of the author.

Keywords: genocide European Union (EU), Common Security and Defence Policy (CSDP), European Commission (EC), European Defence Agency (EDA), European Aviation Safety Agency (EASA), Capabilities-Expectations Gap, Research & Technology (R&T), Research & Development (R&D), Horizon 2020, Permanent Structured Cooperation, European Defence Technological and Industrial Base (EDTIB), Dual-Use Technology, Remote Piloted Aircraft Systems (RPAS), Unmanned Aerial Vehicles (UAVs), Hybrid Drones

Contents

List of Acronyms

ASD	AeroSpace and Defence Industries Association of Europe
AAR	Air-to-Air Refuelling
ATM	Air Traffic Management
BSUAV	Border Surveillance by Unmanned Aerial Vehicles
CFSP	Common Foreign and Security Policy
CSDP	Common Security and Defence Policy
EASA	European Aviation Safety Agency
EEAS	European External Action Service
EC	European Commission
EDA	European Defence Agency
EDTIB	European Defence Technological and Industrial Base
ESA	European Space Agency
EU	European Union
EUROSUR	European Border Surveillance System
ISR	Intelligence, Surveillance and Reconnaissance
JRC	Joint Research Centre
MIDCAS	Mid Air Collision Avoidance System
OPA	Optionally Piloted Aircraft
PA	Preparatory Action
RPAS	Remote Piloted Aircraft Systems
R&D	Research & Development
R&T	Research & Technology
SES	Single European Sky
SESAR	Single European Sky ATM Research
UAVs	Unmanned Aerial Vehicles

Introduction

Since the conception of the modern state the defence dimension, including the defence industry, has been as an essential element of state sovereignty and monopoly, singularly endorsed and subsidized by national governments. The defence sector is now subjected to globalization processes[1] that are determining the emergence of transnational defence markets and structures, weakening the so-called national monopoly of defence industries and creating opportunities for transnational cooperation across projects and issue areas. Since the end of the Cold War, it could be said that the international defence industrial setting has undergone dramatic changes, with the United States (US) as the undisputed mandarin and the European states tagging along and slowly increasing their efforts to rationalize their defence industries.

Confronted with such a situation, the EU should not only enhance and build upon its transatlantic relations, but it should also find mitigating solutions to possible negative threats from its transatlantic partner. The US could interpret the EU's autonomous defence developments as a strategic challenge. Both Britain and France should also realise that a more 'balanced partnership'[2] with the US is in order, but that will also come at the price of the US being more aware of the EU's soft-balancing endeavours. 'Soft balancing' between transatlantic partners could be instead mitigated by their economic interdependence and other potential threats arising from Russia and China. Not only that the EU's defence developments call for more equality in the transatlantic partnership, but they could also lead to a renegotiation of roles with the EU standing as a fully-fledged security actor in the international arena.

Less than a century ago, Edmund Husserl's warning words about Europe were more than farsighted: 'the gravest danger menacing Europe is its lassitude.'[3] Applied to the security and defence international landscape, his words ring even truer. In the current climate of fiscal and economic austerity, recent debates on the EU's defence capabilities have centred on Europe's clear lag, warned against cuts in national defence budgets, and called for 'pooling & sharing' strategies for enhanced defence cooperation at the EU level. Nonetheless, the case for strengthening the EU's defence policy has been made even harder to support in the domestic debate over resources and priorities. The European defence sector needs to contend with public finances under pressure from a growing pension burden, a shrinking recruitment pool, and societies increasingly cautious about interventionist military operations, being more concerned with issues of legitimacy in the use of force and unwarranted 'defence' spending.

In a post-Westphalian world of diffused risks and emerging geostrategic competition, the EU needs to put forward a pragmatic strategic vision based on prioritisation of common interests and values. The EU has to move beyond what has been widely perceived as reactive and *ad-hoc* tactical reactions to global security crises and define a European level of ambition and vision of the future**.** The current international *status-quo* spells worrying scenarios for the EU, with challenges building on many fronts, *i.e.* from Russia's geopolitical revisionism, instability in the Middle East, failed states in Africa, to global threats like maritime insecurity, climate change, hybrid warfare, energy dependency, cyber terrorism, barriers to trade and investment, organized crime, the migration crisis, nuclear issues, Islamic

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[1] K. Hayward, 'The Globalization of Defence Industries,' *Survival* 42/2 (Summer 2000): 115-116.
[2] S. Jones, *The Rise of European Security Cooperation* (Cambridge University Press, 2007): 180.
[3] E. Husserl as quoted in Z. Bauman, 'Quo vadis, Europe?,' *openDemocracy*, 2 June, 2014. Accessed September 25, 2015. https://www.opendemocracy.net/can-europe-make-it/zygmunt-bauman/quo-vadis-europe

radicalism, terrorism, and WMD proliferation etc. For the EU to preserve its global normative influence and long-term approach to global public goods and shared values, it also needs to be backed by credible military power and security and defence capabilities. In doing so, the High Representative Federica Mogherini's preparation of the EU Global Strategy for Foreign and Security Policy[4] in June 2016 will need to circumvent the dichotomies of internal *versus* external security or soft *versus* hard power.

The mantra of the day is that the EU Member States 'are still lacking critical capabilities to ensure they retain their ability to act as security providers.'[5] Preserving strategic autonomy and being able to face future operational challenges in Europe is to be achieved through loosing sovereignty, a daunting challenge, especially in a high-politics field such as defence. However, political will has been developing at the EU level concerning hard defence capacity build-up, as demonstrated by the recent policy initiatives and strategies spearheaded by the European Defence Agency (EDA) and the European Commission (EC).

A useful way of thinking of just how far the EU security and defence policies have developed is to distinguish between three types of policy[6]. *Soft security policy* centres on the promotion of peace and security and uses non-military tools for this purpose. *Hard security policy* involves being prepared to use military capabilities for conflict resolution, peace-keeping, and peace monitoring. *Defence policy*, as traditionally understood, has at its core primarily using military force, if necessary offensively, for the defence of territory and for 'high security' reasons. The EU's security and defence policies fall manly in the first and second category, yet recent developments point towards clear signs of moving towards the latter category, a more coherent pan-European common defence policy.

As already mentioned, since the conception of the modern state, the defence industry has been considered a fundamental element in the nation states' monopoly on violence (Max Weber) in a given territory. The defence industry has been traditionally endorsed and subsidized by national governments for national strategic interests. On the other hand, national defence sectors are now also subjected to globalization processes[7] that are triggering the emergence of international, European and transnational defence markets and structures. Recent developments mark the possibility for dislocating the traditional locus of authority in defence matters: from the national level, towards a European, supranational defence integration, with the corresponding decline of state sovereignty[8] in this field.

In an emerging European defence context, when traditional, state-based structures and rationalizations of strategic action are in question, the principal stakeholders of the European defence field[9] are increasingly networked: user communities, service providers, technology providers, arms industries, national authorities, and European policy makers together come together to define the EU's defence priorities. The assumption is that two important groups have played an important role as normative entrepreneurs at EU-level for a European defence policy and offered an alternative discourse to the pure sovereign-based notion of defence.

The *first group* is that of the arms industry *per se*, the economic, corporate policy entrepreneurs, whose actions are motivated by political economic interests and who aim to loosen Member States' control over national defence equipment markets. The *second group*

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[4] Global Strategy to steer EU external action in an increasingly connected, contested and complex world, http://www.eeas.europa.eu/top_stories/2015/150627_eu_global_strategy_en.htm

[5] European Defence Matters, *A magazine of the European Defence Agency*, Issue 08 (2015): 5.

[6] N. Nugent, *The Government and Politics of the European Union* (Palgrave Macmillan, 2006): 500.

[7] Hayward, 'The Globalization of Defence Industries,' 115-116.

[8] M. Davis Cross, 'An EU Homeland Security? Sovereignty vs. Supranational Order,' *European Security* 16/1 (March 2007): 94.

[9] F. Mérand, *European Defence Policy Beyond the Nation State* (Oxford University Press, 2008).

is that of EU policy entrepreneurs, whose technocratic traditions, values and deep-seated priorities make a great impact on European defence policy. They function as a very specialized, transnational and epistemic expert group, with its own internal rules and vested interests. The level of their Europeanization or their lingering adherence to national-based strategic templates is of particular interest in the recent policy debated over funding for more European defence.

The defining challenges of the 21st century are global in scope, not national. The time is ripe for the EU Member States to forge an effective foreign, security *and* defence policy, in an effort to set the stage for a European vision for common defence. Against this background, it is quite understandable that various defence-oriented issues recently gained increased prominence on the EU's policy agenda.[10] Equally, even though consensus has been reached among EU Member States to preserve the EU's strategic autonomy by funding for and developing hard defence capabilities, apathy and inaction could be observed at the implementation end of such strategies. While deliberations have been extensively focused on the convergence in the strategic thinking of the EU Member States so as to construct a shared view on the European defence policy, less attention has been given to the practical implications for the European defence industry and market.

What are the main trends in the European defence industry? In the context of rising geopolitical challenges and global technological innovations, the EU Member States have diminished economic power to sustain, individually, cutting-edge and competitive arms industries. The EDA's success in converging national strategic needs is still under question, especially in terms of its efforts to create a strong European defence market, to revitalize a dying European defence industrial base, and to encourage Member States to spend more on defence research and emerging technologies.

This focus paper calls for unpacking the contested concept of technology in relation to defence, special consideration being given to the correlative concepts of dual-use technologies, emerging technologies, spill-overs, spin-off, spin-ins from the civilian to the military sector or *vice versa*. Additionally, the European defence industry is seen as a *sui generis* sector dominated by structural challenges, political decisions, economic imperatives, but also by high-level strategic restrictions of secrecy.

In doing so, the research aims to reconstruct the levels of civilian and corporate involvement in shaping the EU's military and defence sector, by investigating the case-study of EU-sanctioned Remote Piloted Aircraft Systems (RPAS) programmes. The increasing interest demonstrated by the European Commission in the European defence sector through facilitating access to regulation for RPAS integration into the commercial/civilian airspace will also be examined.

The European Commission and the European Aviation Safety Agency (EASA) have played major roles in supporting the EDA's efforts as regards drone development and policy evolution: by softening regulation barriers, enabling certifications, and by advancing strategies for defence market liberalisation. The EDA has been successful in bolstering a single collaborative defence input[11] into the European Commission's Single Sky programme,[12] by paving the way for the RPAS introduction into civilian airspace. Together

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[10] P. Joenniemi, 'Towards a European Union of Post-Security?,' *Cooperation and Conflict* 42/1 (2007): 136.

[11] European Defence Matters, *A magazine of the European Defence Agency*, Issue 08 (2015): 11.

[12] EUROCONTROL and the Single European Sky: 'The Single European Sky helps the European air traffic management to solve current issues that affect air transport and to cope with future demand. The two Single European Sky (SES) packages provide a legislative framework to meet future air transport safety, capacity and efficiency needs at European rather than at a national level. In this dossier find out what has been achieved so

with the EDA, the EASA, the European Space Agency (ESA), and EUROCONTROL have also contributed significantly in establishing airworthiness benchmarks for RPAS capabilities.

What drives the backing of this new policy development? Is there a necessity-driven agenda in terms of new security challenges that justifies and calls for dual-use technologies and RPAS? One explanation for the EU's policy shift in supporting unmanned aerial vehicles (UAVs) and RPAS development programs could be accounted for by their job creation potential. The aim would be to allow the European arms industry to become a global leader in the market of emerging technologies. In addition, it is argued that the development of disruptive technologies such as dual-use drones strengthens the robotics industrial base for civilian and commercial use, it encourages the development of systems engineering skills, and it calls for expertise in artificial intelligence. Not to mention the necessity of funding for dual-use R&T, as underlined by Chief Executive of the EDA, Mr Jorge Domecq, so as to avoid 'spending twice' and boost civil-military synergies.[13]

The goals and interests of the European Union and the defence industry have been increasingly converging, particularly now that the EU is set on consolidating its defence identity under the umbrella of the Common Security and Defence Policy (CSDP). In a study conducted on 100 arms-producing and military services, the Stockholm International Peace Research Institute (SIPRI) noted that out of the top 100 arms manufacturers, 30 are from Europe[14] and in the EU, more than 700,000 people work in the aerospace and defence industry.[15]

It is without any doubt that the major stakeholders in the defence industry have both the political and economic power to influence the EU's policy agenda, especially due to the fact that there are overlapping interests in the partial and majority state ownership of EU-based companies, *i.e.* 'Finmeccanica, which is partly owned by the Italian state; Thales, partly owned by the French state; and Airbus Group (formerly EADS), which is partly owned by the French state, German state and Spanish state.'[16]

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far, and what are the next steps to be made towards reaching a more efficient European airspace.' Accessed September 25, 2015. http://www.eurocontrol.int/dossiers/single-european-sky

[13] The EDA, Latest News, 'Exploring hybrid threats,' September 25, 2015, Brussels. Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/09/25/exploring-hybrid-threats

[14] M. Heinrich, 'Elusive transparency in the EU: defence industry influence in Brussels,' *openDemocracy*, February 2, 2015. Accessed September 25, 2015. https://www.opendemocracy.net/can-europe-make-it/markus-heinrich/elusive-transparency-in-eu-defence-industry-influence-in-brussels

[15] A. Saini, 'Building a Science Career in the Defence Industry,' *Sciencemag*, May 22, 2009. Accessed September 25, 2015.
http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2009_05_22/caredit.a0900067

[16] *Ibidem*

Table I Top 10 European Defence Companies 2013 Official Lobbying Expenses in the EU[17]

NAME OF COMPANY	OFFICE IN BRUSSELS	REGISTERED LOBBYISTS	EXPENSES IN EURO
BAE Systems	Yes	1	200,000
EADS (now the Airbus Group)	Yes	13	500,000
Finmeccanica	Yes	6	50,000
Thales	Yes	5	300,000
Rolls-Royce	Yes	48	1,750,000
Safran	Yes	50	495,000
DCNS	Yes	3	50,000
Babcock International	No data	No data	No data
Saab	No data	3	300,000
Rheinmetall	No data	No data	No data
			TOTAL: 3,645,000

The economic argument for investing in defence seems to hold, the example of the AeroSpace and Defence Industries Association of Europe (ASD) as the most encompassing defence industry lobby association more than proving the point.[18] The ASD stands for the Civil Aviation, Space, Security and Defence industries in Europe that generate a 'turnover of approximately 197 billion euro, invest over 20 billion euro in R&D, employ some 778,000 people and encompass over 3,000 companies and 80,000 suppliers, many of which are SMEs.'[19] This association of industries has set forth for itself the lofty aims of preserving Europe's technological excellence and of securing Europe's force-projection. It plays an important role on the global stage, going as far as claiming to protect European citizens from global threats. Since national defence spending in Europe is currently at a standstill, the defence industry seeks to maximise its market growth through other avenues, and the EU offers interesting incentives concerning defence-led R&D and R&T innovation.

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[17] Data for Saab: 2011, Data for Thales: 2014, Rest: 2013 adapted from Heinrich, 'Elusive trasparency,' 2015.

[18] The AeroSpace and Defence Industries Association of Europe (ASD) Website. Accessed September 25, 2015. http://www.asd-europe.org/about-us/

[19] *Ibidem* 'The essence of the Association is to provide a single platform for the development of joint positions for the industries it represent. Adept at spreading the word regarding new policies and possible legislative development, ASD raises awareness and promotes the values and positions of its members to all EU institutions. Located in the heart of Brussels, ASD's membership today is composed of 15 major European Aerospace and defence companies and 26 member associations in 19 countries: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey and the UK.'

The principal hypothesis of this Focus Paper is that the EU has set forth on a *stealth* path to strengthen the EU's defence industrial base: by calling for and prioritizing military-grade or civilian drone research; and, more recently, by benefiting from dual-use technologies and dual-use research and production projects. Is the hybridization of R&D research for civilian-military capabilities the EU's clever strategy to avoid the Treaties' restrictions on using the massive Structural Funds (SF) for strictly military purposes? This interpretation rings true; the EU aims to boost the European defence industry by funding for civilian-military R&D under FP7, Horizon2020 or COSME programmes. Or is this yet again another EU-level form of escapism from developing strictly speaking hard military capabilities?

There are indicative examples of a pan-European hybrid drone development trend, favouring large security and defence companies and a club of select and powerful drone-developing EU Member States. Moreover, regulatory safeguards for airworthiness and air traffic management (ATM) programmes are being pushed forward for the safe insertion of military aircrafts and drones in the civilian airspace. The study will also tackle the main initiatives and projects at the EU-level responsible with the RPAS' air traffic insertion that must be put in place to ensure the technical safety and the safe operation of RPAS in civilian and commercial airspace.

To paraphrase the expression 'everywhere in [Europe, [man] remain[s] unfree and chained to technology' from Heidegger's 'The Question Concerning Technology'[20], the situation in the EU concerning RPAS development could spell worrying scenarios. The more this type of technology advances, the more it 'threatens to slip from human control'[21] or, in this case, from democratic control.

More critical thought should be given to the choice for prioritising dual-use technologies to bolster the European defence market to preserve the EU's security autonomy in the future. Issues pertaining to democratic accountability and oversight will be addressed in the research, especially concerning the role of the European Parliament. How removed is the European defence policy from the authority of national parliaments, the European Parliament, or public opinion accountability?

The EU decision-makers have been under lobbying pressures from powerful arms corporations,[22] with the increasing tendency to denationalize military industries and streamline a more cost-effective, competitive and technologically superior pan-European arms industry. Three big EU-based arms-producing companies, such as the Airbus Group (ex-EADS), BAE Systems and Thales, are some of the major players in the field and assert their own agenda and strategic interest in the European defence policy realm.[23]

National Defence Technological and Industrial Bases (DTIBs) in Europe have come under increased pressures to produce competitive defence capabilities, due to budgetary restrictions and defence market forces.[24] there is no denying the fact that the centre of gravity for defence technology R&D and innovation has shifted from defence to the civilian sector[25]

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[20] M. Heidegger, *The Question Concerning Technology and Other Essays* (New York & London: Garland Publishing Inc., 1977): 287.

[21] *Ibidem*, 289.

[22] D. Fiott, 'EADS, BAE Systems and the future of European armaments cooperation,' *European Geostrategy*, April 2, 2013. Accessed September 25, 2015. http://www.europeangeostrategy.org/2013/04/eads-future-armaments-cooperation/

[23] *Ibidem*

[24] D. Fiott, 'The European Defence Technological and Industrial Base: Five Suggestions' in 'The State of Defence in Europe: State of Emergency?,' *EGMONT PAPER 62* (ACADEMIA PRESS, November 2013): 73-74.

[25] M. Penny, T. Hellgren, & Matt Bassford, 'Future Technology Landscape: Insights, analysis and implications for defence,' *RAND Europe*, December 5, 2013. Accessed September 25, 2015

because of economic austerity reasons and the sharp decline in Europe of national defence R&D and R&T investment programmes post-Cold War.

The maintenance of a strong European Defence Technological and Industrial Base (EDTIB)[26] was set out to become a top mission for the EDA: by improving both the EU's defence capabilities and the military expenditure of Member States. The key role played by the Agency was reaffirmed by the Lisbon Treaty, which recognized the Agency's central position in 'identifying and implementing any useful measure for strengthening the industrial and technological base and improving the effectiveness of military expenditure.'[27] The European Commission has supported the EDA's efforts as regards the EDTIB by softening regulatory prerequisites and by advancing strategies for defence market liberalisation.

The study starts off by investigating the role of EDA as a credible driver of pan-European defence, it moves forward with the EU-level policy agenda to push for dual-use technologies research, and it investigates the case of EU-backed civilian-military RPAS programmes in relation to the EDA, the European arms industry and major drone-producing Member States. The research centres on two dimensions when analysing the EU's defence field: a normative one, highlighting the implications of recent defence developments in terms democratic accountability, the EU's defence identity and its recent militarization tendencies; and a rationalist one, tracing the strategic conditions and preferences, which reduce transaction costs and give economic-efficient results in defence development at EU level.

In terms of methodology, the study makes use of a longitudinal research and cross sectional design for analysing changes from the creation of the EDA to the present policy and institutional developments in the field of the EU's defence and drone policy evolution. Data on the major role played by the European defence industry and market in shaping European defence will also be analysed. Empirical evidence on major drone-developing EU Member States and arms manufacturers will be put forward, speaking to certain trends in the evolution of the EU's and the EU's policy shift for supporting RPAS. Special attention will be given to the EU's plan for irregular migration control, FRONTEX, and the EU's dronization of border management.

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http://www.rand.org/randeurope/research/projects/future-technology-landscapes.html

[26] The EDA, *Strategy for the European Defence Technological and Industrial Base*. Accessed September 25, 2015. https://www.eda.europa.eu/aboutus/whatwedo/strategies/Technologicalandindustrialbase

[27] *Ibidem*

The Role of EDA and Steps towards a Pan-European Defence Policy

The EU Member States on June 2003 in Thessaloniki first announced their intention to create a European Defence Agency (EDA)[28] under their express control, the idea behind it being the creation of an institutional *tool* in the hands of national interests. After a year, and under a Joint Action of the Council of Ministers on 12 July 2004, the EU Member States decided to create the European Defence Agency for the purpose of supporting them and the Council to improve European defence capabilities in the field of CSDP crisis management missions.

The EDA retains a fundamentally intergovernmental nature: 'The European Defence Agency (EDA) is an intergovernmental Agency of the European Council. Currently, 27 countries – all EU Member States except Denmark – participate in the EDA. (…) All Administrative Arrangements are approved by the European Council. The Head of the Agency is responsible for negotiating these arrangements in accordance with directives given by the EDA Steering Board.'[29] Member States are the key 'shareholders' of the EDA.

This is further accounted for by the fact that the Steering Board has the mandate of the Council and acts under its authority – 'EDA is the only EU Agency whose Steering Board meets at ministerial level. At the meetings of this governing body, Defence Ministers decide on the annual budget, the three year work program and the annual work plan as well as on projects, programs and new initiatives. The Head of Agency, who is the High Representative of the Union for Foreign Affairs and Security Policy, is also Vice-President of the European Commission. The EDA Chief Executive is appointed by decision of the Steering Board.'[30] The EDA's budget is € 30,5 m for 2015, the functioning element of the budget is used to cover the personnel and general running costs of the Agency, and the Operational Budget is used for feasibility and other studies.[31]

Since its creation, the EDA's main purpose was to become a *platform* or *framework* for the improvement of European military capabilities: it aimed to boost a dormant defence industry and market, to expand the collaboration between Member States on defence issues, and to rationalize technological research in the defence field. Such prerequisites were made particularly clear by the conclusions from the 19-20 December 2013 European Council[32] meeting on defence priorities for the EU.

This moment signified that there was an important shift in the strategic vision of EU Member States, prompting them to upgrade the European defence program through the improvement of 'smart' weaponry and the creation of a competitive European defence industry and market. More importantly, this moment marked a clear identity shift for the

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[28] The European Defence Agency (EDA). Accessed September 25, 2015. https://www.eda.europa.eu/
[29] The EDA – Background Information). Accessed September 25, 2015. http://www.eda.europa.eu/Aboutus/who-we-are
[30] The EDA's Steering Board. Accessed September 25, 2015. http://www.eda.europa.eu/Aboutus/who-we-are/governance
[31] The EDA – Finance. Accessed September 25, 2015. http://www.eda.europa.eu/aboutus/who-we-are/Finance
[32] The European Council Conclusions (19/20 December 2013). Accessed September 25, 2015. http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/140245.pdf

EDA, from a tool solely advancing national interests (or framework facilitating defence cooperation) to a genuine architect[33] when building capabilities for European defence.

Several ranking goals and guiding lines were prioritized by the Council in December 2013:

- the development of an EU Cyber Defence Policy Framework;

- the creation by the EDA and the High Representative, in line with existing NATO planning processes, of a policy framework encouraging *long-term cooperation in defence planning*;

- providing a common European answer to the critical security risks arising on the global geopolitical agenda;

- the launch of an EU Maritime Security Strategy;

- the involvement of the EDA in examining pooling and sharing scenarios as regards common defence industrial standards, procurement projects, and options for lowering the cost of military certifications, by increasing *mutual recognition* between Member States.

In light of the above, a clear and resolute direction can be observed, with conclusive steps taken in strengthening, deepening, and widening the EU level defence collaboration. In terms of cooperative defence research programmes, the European Commission in partnership with the EDA as 'the hub of defence research at EU-level'[34] is planning to launch a Preparatory Action (PA) on CSDP-related research, which will shift financing opportunities in support of European defence cooperation and of the European defence industries from Members States to the EU *per se*.

A political economy viewpoint further sheds light on the challenging process of creating, renewing and transforming Member States defence capabilities in the context of political-economic limitations, such as: the scope, power and size of the Member States defence industries; regional and international defence market structures; political and social interests related to the occupation of workforce; market shares; as well as other ideological and cultural aspects.

Overall, if the EDA remains solely an agent of the European principals without credible biding power, it will surely fail to become a strong galvanizing force and facilitator with the necessary agency to be able to address the capabilities-expectations gap the EU is currently facing. The role of the EDA as a key enabler to help Member States meet their capabilities shortfalls still remains under question, due to its intergovernmental institutional setup. As long as the EDA is financed by Member States in proportion to their gross national income and not by the European Union, the common interests and issues in defence reform will not take precedence.

Several high ranking issues have taken priority on the EU's security and defence agenda, from emphasized pragmatism in defence cooperation, boosting the defence dimension in the CSDP, preserving defence capabilities, favouring RPAS development as critical technologies, funding for competitive R&D and R&T, increasing the digital security agenda of the EU, to putting forward a new deal for European Defence:

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[33] J. Coelmont & S. Biscop, 'Building European Defence: An Architect and a Bank,' EGMONT Royal Institute for International Relations, *Security Policy Briefs* 56 (May 2014): 1. Accessed September 25, 2015. http://www.egmontinstitute.be/wp-content/uploads/2014/05/SPB56.pdf

[34] The EDA: Preparatory Action for CSDP-related research, June 18, 2015. Accessed September 25, 2015. http://www.eda.europa.eu/what-we-do/activities/activities-search/preparatory-action-for-csdp-related-research

1. The Common Security and Defence Policy (CSDP) – Towards a European Union of Common Defence?

The Common Security and Defence Policy (CSDP) of the European Union (EU) epitomises an unparalleled institutional effort on the part of EU Member States to offer a comprehensive response to global security risks. The CSDP, unlike most of EU's supranational policies, remains exclusively under the competence of EU Member States, issues pertaining to the high-politics realm of security and defence being still considered as top priorities to national sovereignty.

Critical voices have argued that with the new European Global Strategy the time is ripe for the EU Member States to forge an effective security and defence policy, leading to a common defence. Against this background, it is quite understandable that various defence-oriented issues have gained increased prominence on the EU's agenda.

The EU's Common Security and Defence Policy, from this perspective, could be interpreted as offering the policy outlines towards possibly the creation of what Deutsch has termed "security communities"[35] in a regional context.

The use of the term security community points at the community's capacity to constitute an autonomous common military front against an external threat. All the same, for this to occur, the EU's CSDP needs to reach unprecedented levels of both *de-territorialisation* and *de-nationalisation*.[36]

The aim of the EU with the further development of the CSDP was to become autonomous strategically and at a military operational level, especially if it wanted to be perceived in the future as a credible global actor and an international security provider. With the CSDP, the EU has been uniquely placed to respond to international crisis-management challenges, given its comprehensive or holistic approach to security, normative legitimacy, and niche capabilities designed for integrative civilian-military planning**.**

Also, with the opportunity for 'Permanent Structured Cooperation'[37] emerging out of the Treaty of Lisbon, an institutional framework has been established by which a group of Member States can move forward in security and defence integration. Two further observations regarding permanent and structured cooperation could be made: the framework increased the legitimacy and the political weight of the intervening Member States and at the same time strengthened the profile of the EU as a security and defence international actor; but it also reflected, *inter alia*, a multi-speed Europe, and a tendency towards the formation of an in-group or a select club within the EU club.

While explicit mutual territorial defence guarantees were excluded from the Treaty of Lisbon and the CSDP,[38] the great diversity of threats to security made it increasingly difficult

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[35] M. Griffiths, *Fifty Key Thinkers in International Relations* (London and New York: Routledge, 1999): 288.

[36] Most use of European military power takes place far from national borders and does not involve territorial expansion, occupation or conquest within Europe or in the world. J. Haaland Matlary, 'When Soft Power Turns Hard: Is an EU Strategic Culture Possible?,' *Security Dialogue* 35/1 (2006): 108.

[37] See The Treaty of Lisbon, Permanent Structured Cooperation. Accessed September 25, 2015. http://europa.eu/legislation_summaries/glossary/permanent_structured_cooperation_en.htm

[38] See The Treaty of Lisbon, The Mutual Defence Clause. Accessed September 25, 2015. http://europa.eu/legislation_summaries/glossary/mutual_defence_en.htm

to draw distinct lines between international crisis management and national defence, and between differentiating stages in the *security continuum*.

The assumption is that the EU has reached a critical juncture point with the EU Summit in December 2013 as it stands poised at the threshold of a possible European common defence policy[39] under the headline that 'defence matters.' Such a policy shift would be unprecedented in the history of the EU, because it would mark a genuine move towards definitive defence integration, and the corresponding decline of state sovereignty.

With the emphasis given to defence, the CSDP has been undergoing a pragmatic-oriented rebranding so as to maximize European vital interests in key foreign and security policy areas such as: the conflict resolution cycle, the continuum between external and homeland security, vulnerabilities in distinct geographical and institutional settings, the revaluation of the transatlantic partnership, permanent planning logistics and collective capabilities development for the CSDP, a clear division of strategic objectives between NATO and the CSDP, and the EU's *differentia specifica* or 'the European way' to security.

2. Emphasized Pragmatism in Defence Cooperation and exports, Streamlined by Projects and Groups of Countries

The export of defence equipment can be termed as an emotional topic[40] for European countries, involving not only issues of national defence interests and a convoluted process of political, economic and military decision-making process. It also galvanizes issues pertaining to the field of ethics and human rights, as well as cuts from other sectors in society for subsidizing the arms export. National defence industrial sectors need the consent of national governments before exporting critical national technologies.[41] There could be increased concern among smaller Member States that funding efforts for defence projects will be directed to larger Member States with more competitive defence sectors.

The national defence industrial capabilities in Europe, seen separately, displays significant differences:

- with the first round of nuclear powers and UN Security Council seats, such as France and the United Kingdom, having the largest defence industries;

- with the second round of Germany, Italy, and Sweden, followed closely by Spain;

- with the third round of countries, Belgium, the Netherlands, Finland, Poland, the Czech Republic, Denmark and Romania, who have limited capacities;

- and lastly with the fourth round of Member States with very limited or no defence industries.[42]

To appease such fears, the EDA should become more independent from leading Member States. It should avoid running the risk of being used as a vehicle for national interests and preferences in terms of streamlining certain projects or cooperative frameworks over others.

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[39] Cross, 'An EU Homeland Security?,' 94.

[40] S. Martin, 'Do military export stimulate civil export?,' *Applied Economics* 34 (2002): 599.

[41] Jones, *The Rise of European Security Cooperation*, 140.

[42] M. Trybus, *Buying Defence and Security in Europe The EU Defence and Security Procurement Directive in Context* (Cambridge University Press, 2014): 23-24.

National defence budgets need to contend now with public finances under pressure from a growing pension burden; a shrinking recruitment pool; and societies increasingly cautious about interventionist operations abroad, concerned with issues of legitimacy in the use of force, and the public opinion more inclined to favour soft power strategies over hard capabilities and 'defence' spending.[43]

On the other hand, a widespread view among Member States is growing concerning increased investment in defence industries that might provide the required economic boost to help alleviate the economic crisis in Europe, with the EU defence sector worth €96 billion, and providing 1.5 million jobs.[44]

There are indeed economic arguments in favour of a joint European defence policy, with studies estimating 'the potential savings that can be achieved through European cooperation at between €26 bn and €130 bn.'[45] Emphasis is laid on gains emerging from defence trade and competition in the EU, from a liberalized EU-level defence market, from the creation of scale economies, and from reducing duplication of expensive R&Ds.

The EDA Member States' aggregated defence data for 2013 of the 27 EDA participating Member States[46] reflects Europe's defence expenditure decrease. It stands to prove that national defence budgets are an easy target for finance ministries to balance the books, 2013 being no exception to the recent years' trend across the EDA Member States to cut defence spending.

Despite the fact that EDA increased from 26 to 27 Member States in 2013, the total defence expenditure of its Member States decreased by EUR 1.7 billion or 0.9 %, compared to 2012, to EUR 186 billion. By contrast, the EU-US Defence Data for 2011 shows that the US spent €503 billion on defence in 2011 compared to €193 billion spent in the EU: around 2,5 times more. The EU data represents the spending of the 26 EDA participating Member States.[47]

In real terms, the total defence expenditure has been declining since 2006, dropping by over EUR 32 billion or about 15% from 2006 to 2013.[48] Both as a share of GDP and as a share of the total government spending, defence expenditure has decreased for the seventh year in a row to its lowest values since 2006, 1.45% and 2.97%[49], respectively.

R&D/R&T expenditure displays even more worrisome and vacillating trends, with 'defence investment, comprising equipment procurement and R&D (including R&T) expenditure, following a sharp decrease in 2011 (-10.5%), increased slightly in 2012, but

[43] The EDA, Future Trends from the Capability Development Plan. Accessed September 25, 2015. http://www.eda.europa.eu/docs/documents/brochure_cdp.pdf

[44] The Institute of International and European Affairs. Accessed September 25, 2015. http://www.iiea.com/

[45] Independent Review on European Security & Defence, *The European Security and Defence Union* 18/1 (2014): 41.

[46] The EDA Defence Data 2013. Accessed September 25, 2015. http://issuu.com/europeandefenceagency/docs/eda_defence_data_2013_web/1?e=4763412/12106343

[47] The EU-US Defence Data 2011. Accessed September 25, 2015. http://www.eda.europa.eu/docs/default-source/news/eu-us-defence-data-2011.pdf

[48] The EDA Defence Data 2013. Accessed September 25, 2015. http://issuu.com/europeandefenceagency/docs/eda_defence_data_2013_web/1?e=4763412/12106343

[49] *Ibidem*

decreased again in 2013 below the level it was in 2006, to EUR 37.5 billion or 20.1% of the total defence expenditure.'[50]

4. A New Deal for European Defence and the Commission's Preparatory Action

In 2013, 'A New Deal for European Defence'[51] or roadmap has been put forward by the European Commission in collaboration with the EDA so as to strengthen the Single Market for defence, to give the European defence industry the much needed competitive edge, and last but not the least to 'foster synergies between civil and military research.' Ranking high among the above-mentioned objectives is the new 'Preparatory Action,' a type of probationary test case for the European Union directly contributing to defence-oriented R&D and R&T for the CSDP.

This unprecedented step could be construed as a type of hedging strategy[52] initiated by the EU to protect European defence interests from the United States competition but also to maintain Europe's security autonomy in the future. Or is this yet another example of the EU's strategy to exert further control over the CSDP and take over the European defence policy by stealth?

Several steps have been taken by the European Commission so as to improve efficiency and cooperation in the defence sector:

- complete the Single Market for defence and security (improving security supply between EU Member States);

- strengthen the competitiveness of European industry by enhancing competitiveness and by supporting SMEs;

- and bolstering European defence research by maximising synergies between civil and military research.[53]

The last point is to be achieved through developing 'a new programme (Preparatory Action) to explore the potential benefits of EU-funded CSDP-related research'[54] and the European Commission and the EDA have been working closely together with Member States[55] to outline this initiative. The most important element is that the European Commission has proposed a support programme in the form of a one-off and of limited

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[50] *Ibidem*

[51] Preparatory Action for Common Security and Defence Policy (CSDP) in European Commission, 'A New Deal for European Defence: Commission proposes industrial action plan,' Press Release, Brussels, June 24, 2014. Accessed September 25, 2015. http://europa.eu/rapid/press-release_IP-14-718_en.htm

[52] V. Charles Keating & J. Ruzicka, 'Trusting relationships in international politics: No need to hedge,' *Review of International Studies*, available on CJO 2014 DOI: 10.1017/s0260210514000059.

[53] Preparatory Action for Common Security and Defence Policy (CSDP) in European Commission, 'A New Deal for European Defence: Commission proposes industrial action plan,' Press Release, Brussels, June 24, 2014. Accessed September 25, 2015. http://europa.eu/rapid/press-release_IP-14-718_en.htm

[54] *Ibidem*

[55] The EDA, 'First EDA-Commission workshop on the preparatory action for CSDP-related research', Brussels, November 25, 2014. Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2014/11/25/first-eda-commission-workshop-on-the-preparatory-action-for-csdp-related-research

duration and budged Preparatory Action (PA)[56] for CSDP-related research, outside the bounds of the Horizon 2020 type of civil research programmes.[57]

If proven successful in the time-frame of 2017-2019, the Preparatory Action has been heralded as a potential game-changer in the field of European defence research. It could pave the way for permanent funding from the part of the European Commission to support CSDP-related research. In an unprecedented strategic move, it would also open up the EU financing machine for defence research and development beyond the limiting constraints of civil-military R&D under Structural Funds and the Horizon 2020 research programme. As emphasized by the EDA European Synergies and Innovation director, Mr Denis Roger, 'What is at stake is the development of a European technological and industrial base with a critical mass on areas we consider important for the development of CSDP-related capabilities.'[58]

5. Cybersecurity - a High Ranking Issue on the EU's Emerging Security Risks Agenda

The Cybersecurity Strategy of the European Union – An Open, Safe and Secure Cyberspace[59] (February 2013) is the first comprehensive policy document put forward by the former High Representative Catherine Ashton and the European Commission related to cyberspace security issues. The Strategy is meant to prioritize particular policy areas[60] for the EU's international cyberspace: from strengthening the information systems in the EU, confidence-building in online services, to capacity-building strategies involving international partners, the private sector and civil society.

In particular, the Strategy intends to encourage the demand for highly secure Information and Communications Technologies products and to stimulate Research and Development plans by the EU Member States in collaboration with the EDA so as to create competent and competitive technical resources for cyber defence.

The term cybersecurity advanced by the Strategy has remained vague and a blanket term that encompasses an array of issues ranging from responsibility, freedom and openness, trust, public and private industry collaboration, the protection of privacy, the combat of cybercrime, to ensure better cooperation between Member States and to encourage spending in cutting-edge cyber defence technologies.

Cyber defence as the military dimensions of cyber security is put forward as a priority action by the EDA, ranking high as regards the EU's capability development plan to protect key systems and services that support and enable military tasks and operations.[61]

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[56] Daniel Calleja Crespo, Director General, European Commission's Directorate-General for Enterprise and Industry, '3 Ways to put Dual-use Technologies at the Centre of EU Industrial Policy,' *Friends of Europe*, June 12, 2015. Accessed September 25, 2015. http://www.friendsofeurope.org/security-europe/3-ways-put-dual-use-technologies-centre-eu-industrial-policy/

[58] Interview with Chief Executive of the EDA Mr Jorge Domecq, *European Geostrategy*, July 15, 2015. Accessed September 25, 2015. http://www.europeangeostrategy.org/2015/07/interview-with-jorge-domecq/

[59] The EU Cybersecurity Strategy. Accessed September 25, 2015. http://eeas.europa.eu/policies/eu-cyber-security/index_en.htm

[60] *Ibidem*

[61] The EDA, Complex cyber crisis management exercise in Vienna, September 16, 2015. Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/09/16/complex-cyber-crisis-management-exercise-in-vienna

In particular, *aviation systems and RPAS are of highest priority in terms of safety and security*, the main goal being to eliminate potential vulnerabilities open to attacks from hackers, cyber criminals and terrorist focusing on 'the theft of information and general disruption to potential loss of life.'[62]

Even though there is a lack of territoriality and borders in the cyberspace and for cybercrimes, Member States still remain entrenched in the vision that cybersecurity is part of their national security agendas. The terminology used to define cybersecurity issues varies across national context, private industry, and civil society, leading to a fragmented understanding and the lack of a reliable international definition of the term.

On top of that, it still remains unclear how responsibility should be distributed among stakeholders from either the EU institutions, national governmental bodies, or the private sector, as the most relevant drivers of a coherent plan of action.

In this respect, the Strategy was accompanied by proposals for a set of unified network and information security rules, which demand regulatory obligations to attempt the coordination of national cybersecurity policies, *i.e*. the 'NIS Directive'[63] proposed by the European Commission in February 2013. On March 13, 2014, the European Parliament voted to adopt the draft NIS Directive as part of an EU cybersecurity effort of harmonization that targets the creation of uniform standards and levels of cybersecurity across the EU.

Also, the Cybersecurity Directive envisages creating Computer Emergency Response Teams (CERTs)[64] in each EU Member States as well as cooperation and information exchange obligations between Member States and the Commission. However, the implementation of such standards depends on the Member States' willingness to redirect funds specifically for cyber defence, to share critical information, or their determination to pass targeted legislation concerning cyber security. In particular, the Strategy intends to encourage the demand for highly secure Information and Communications Technologies products and to stimulate Research and Development plans by EU Members States so as to create competent and competitive technical resources for cyber defence

6. Horizon 2020 – The EU Framework Program for Research and Innovation

In the context of the EU's security policy in the 21st century, Horizon 2020 has come as a timely and targeted financial instrument for bridging the 'structural innovation gap' and for encouraging innovation and the development of 'the industrial and technological resources.'[65] From 2014 onwards, Horizon 2020's comprehensive framework has become the go-to financial honeypot to address Research, Development and Innovation in the field of Cybersecurity and Online Privacy.

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[62] Aviation Unites on Cyber Threat, Civil Air Navigation Services Organisation, December 11, 2014. Accessed September 25, 2015. https://www.canso.org/aviation-unites-cyber-threat

[63] Commission Proposal for A Directive concerning measures to ensure a high common level of network and information security across the Union, February 7, 2013. Accessed September 25, 2015.
http://ec.europa.eu/digital-agenda/en/news/commission-proposal-directive-concerning-measures-ensure-high-common-level-network-and

[64] J. Day, 'Europe proposes new laws and regulations on cybersecurity,' LEXOLOGY, January 2, 2014. Accessed September 25, 2015. http://www.lexology.com/library/detail.aspx?g=1f872876-3d23-44e7-a8f1-92a9be8d080b

[65] Cybersecurity Strategy of the European Union: An Open, Safe and Secure Cyberspace. Accessed September 25, 2015. http://www.eeas.europa.eu/policies/eu-cyber-security/cybsec_comm_en.pdf

The end goal would be the development of reliable Information and Communications Technologies (ICT) solutions that promise the creation of a secure and trustworthy digital environment in the EU and the protection of fundamental rights. The lofty purpose of the funding is 'to help boost Europe's knowledge-driven economy, and tackle issues that will make a difference in people's lives.'[66]

In the words of Madame Claude-France Arnould, former Chief Executive of the EDA, 'We need a cutting-edge industry to support our defence, our innovation, our growth and our security of supply.'[67] Horizon 2020 – The EU Framework Program for Research and Innovation,[68] as the biggest EU Research and Innovation program, is one potential answer for more innovative and competitive defence technologies.

Horizon 2020 – The EU Framework Program for Research and Innovation is the biggest EU Research and Innovation program, with a budget of nearly €80 billion of funding available over 7 years (from 2014 to 2020), in addition to the private investment that this money will generate. Horizon 2020 follows on the EU's Seventh Framework Program for Research (FP7) template, which ran from 2007 to 2013. The Commission will utilize the Horizon 2020 framework to deliver improved coordination of funds and to address a range of areas in the field of security and ITC privacy, from dual-use R&D, innovation and deployment, to supporting the development of instruments to fight cyber-crime and terrorist activities.

It is expected that approximately 2.2% or €1.69 billion of the Horizon 2020 budget will be dedicated to Security research, this being an increase of approximately 20% compared to the FP7. Specifically, Horizon 2020 funds research into activities which aim to bolster the security of current applications, services and infrastructures and especially incentivize the creation of market opportunities for the EU in the digital arena. The focus is thus on giving the EU the needed competitive edge to bridge its digital security structural innovation gap and demonstrate the market feasibility of its up-to-date security solutions.

7. Focusing on Critical Unmanned Systems in the Fields of Intelligence, Surveillance and Reconnaissance (ISR) as well as Air-to-Air Refuelling

Prioritizing Remote Piloted Aircraft Systems (RPAS) by integrating them into the civilian European airspace has become an almost ubiquitous discussion topic on the EDA's agenda. RPAS are put forward as key capabilities for the future of European aviation,[69] benefitting European citizens in the areas of internal-external and civilian-military security matters. The development of pan-European, collective air-to-air refuelling (AAR) clearance protocols, such as the Italian KC-767, is envisaged to improve interoperability in multinational operations.

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[66] European Commission, 'Horizon 2020 launched with € 15 billion over first two years,' December 10, 2013. Accessed September 25, 2015. http://ec.europa.eu/programmes/horizon2020/en/news/horizon-2020-launched-%E2%82%AC15-billion-over-first-two-years

[67] European Defence Agency, *European Defence Matters. A magazine of the European Defence Agency*, Issue 3, 2013.

[68] The Horizon 2020. Accessed September 25, 2015. http://ec.europa.eu/programmes/horizon2020/

[69] The EDA, 'Strong interest for MIDCAS result advancing European RPAS air traffic integration,' September 11, 2015. Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/09/11/strong-interest-for-midcas-results-advancing-european-rpas-air-traffic-integration

In terms of air-to-air refuelling,[70] there are operational and cost inefficiencies, due to the shortfall in the European AAR capability and fleet fragmentation. They require immediate attention as regards building a more balanced and efficient optimization of existing national resources, by including commercial AAR services and by increasing strategic tanker capability by 2020.

Conversely, by extending the RPAS capability to the civilian environment,[71] the EDA must respond to challenges concerning public opinion and perception, not to mention safety issues, and regulations or certifications protocols. The MIDCAS project or the European Detect & Avoid project has been setting the foundation for 'future development in the field of RPAS air traffic insertion'[72] in civilian airspace by proposing a baseline of solutions for 'Unmanned Aircraft System Mid-air Collision Avoidance Function' to be accepted by the manned aviation.

Under the framework of the European Defence Agency, the MIDCAS project was launched in 2009 by five contributing EU Member States who incidentally are also major players in the RPAS production game (France, Germany, Italy and Spain, under the leadership of Sweden). With a budget of €59 million, the MIDCAS project has been playing a key role in aggregating European industries in the field of D&A,[73] becoming a cornerstone to prepare a safe integration of RPAS in no-segregated airspace.

The MIDCAS (Mid Air Collision Avoidance System) industrial consortium is composed of 11 partners: Saab (project leader) from Sweden, Sagem and Thales from France, Airbus D&S, Diehl BGT Defence, DLR and ESG from Germany, Alenia Aermacchi, Selex ES, CIRA from Italy and Indra from Spain. Throughout the project, external stakeholders have been also taking part in the process such as EASA, EUROCONTROL, EUROCAE[74] or JARUS.[75] At the final stakeholder workshop in September 2015 in Brussels, major milestones have been reported that included flight tests with fully automatic avoidance manoeuvres of RPAS.[76] As stated by Mr Peter Round, the EDA Capability, Armament &Technology Director: *'EDA together with its participating Member States are committed to the operation of RPAS in European airspace coordinated with all other military and civilian traffic. MIDCAS has taken a key step forward to prepare the next generation of high performance European RPAS.'*[77]

The EDA also 'faces outwards,' its other stakeholder are third parties such as OCCAR (fr. Organisation Conjointe de Coopération en matière d'ARmement)[78], LoI (Letter of Intent) and NATO. As pertinently observed by Martin Trybus in his article addressing the contribution of the EDA to the European industry and market, the EU Member States are split

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[70] European Defence Matters, A magazine of the European Defence Agency, Issue 5, 2014, 19.
[71] *Ibidem*
[72] MIDCAS – THE European Detect & Avoid project. Accessed September 25, 2015. http://www.midcas.org/
[73] *Ibidem*
[74] EUROCAE, The European Organisation for Civil Aviation Equipment. Accessed September 25, 2015. https://www.eurocae.net/?online=cymbalta-60-mg-indica%F0%B7%F1%85es
[75] JARUS, Joint Authorities for Rulemaking on Unmanned Systems. Accessed September 25, 2015. http://jarus-rpas.org/
[76] The EDA Latest News: 'Strong interest for MIDCAS results advancing European RPAS air traffic integration,' September 11, 2015. Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/09/11/strong-interest-for-midcas-results-advancing-european-rpas-air-traffic-integration
[77] *Ibidem*
[78] OCCAR is a common procurement programme, originally for France, Germany, Ireland and the UK, but later joined by Belgium and most recently by Spain in 2005. By providing industry with joint orders, cheaper production runs should be guaranteed. It was created to smooth cooperation between the military companies in the EU and help provide European governments with cheaper European weaponry. OCCAR & EDA. Accessed September 25, 2015. http://www.occar.int/238

into 'defence-producing countries', *i.e.* United Kingdom, France, Germany, Italy, Spain, and Sweden, and 'defence-consumer countries.'

Nevertheless, the institutional advantage of the EDA and its policy consequences are not to be ignored, because compared to the OCCAR and LoI institutional settings, the EDA does not exclude the 'defence consumer countries.' The EDA puts forward an inclusive approach[79] to solving the existing capabilities gap in the EU but also the gap between defence-producing and defence-consumer countries. The EDA, among other things, serves as an instrument for the Union's industrial defence policy and its 'comparative advantage'[80] is in its overarching ability to comprehend all national agendas and relate them so as to realize their synergies.

The European Commission, especially with its Preparatory Action set for 2017-2019, could also pose interesting challenges in taking lead as regards the EU defence industry and market as well. With the liberalization of the defence market, the Commission has gained a central position, because the defence industry would become subject to the rules of competition, state aid, public procurement, and customs. The bottom line question would be whether *the Commission and the EDA represent competing solutions in the realms of defence industry*, the answer being simplified to two contrasting aspects: the Commission has an indisputable supra-national, market framework,[81] while the EDA represents an intergovernmental take on defence, permitting national governments to withhold an upper-hand in the decision making process.

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[79] M. Trybus, 'The New European Defence Agency: A Contribution to a Common European Security and Defence Policy and a Challenge to the Community Acquis?,' *Common Market Law Review* 42 (2006): 676-677.
[80] *Ibidem*, 676-677.
[81] U. Morth, 'Competing frames in the European Commission – the case of the defence industry and equipment issue,' *Journal of European Public Policy* 7/2 (June 2000):182.

The National/ Post-National Nexus and the EDA – Towards a European Common Defence

The EDA offers the promise of institutionalizing a 'common' defence dimension, being initially created as a response to the increased expectations established by the CSDP civil-military missions and the EU's international force projection as a security provider. Several steps have been made in the formation of a European joint capabilities base, which was stringently needed to improve the EU's operational capacity and its long-term vision for an integrated European defence identity.

For that purpose, the European Defence Agency released a 'Long-Term Vision report' (LVT)[82] in 2006, intended to serve as a compass for defence planners and practitioners over the upcoming twenty years. The report was the product of 11 months of study involving officials and experts from governments, defence bodies, academia and industry across Europe, and it was debated by the EDA Steering Board.

At that time, the Steering Board consisted of the Defence Ministers of the Agency's 24 participating Member States and the European Commission. The participating Member States in the Steering Board noted that the LTV document was explicitly an initial, non-committing document – the Steering Board endorsement did not imply that all Member States had agreed on all particulars. Against that background, what was offered was, at best, a tentative doctrinal basis. It represented a sketchy and timid foundation upon which follow-up work could be built upon, involving a progressively more detailed analysis and policy framing. It aimed to provide more useful guidance to the EU Member States for developing their defence capabilities.In that respect, the EDA has put forward three long-term strategies to reinforce the defence capabilities build-up.

First, the *Strategy for the European Defence Technological and Industrial Base (EDTIB)*[83] in 2007 targeted the EU's self-sufficiency in key defence industrial capabilities and technologies and was set out to highlight the critical enablers to help achieve such objectives by:

- clarifying priorities, by prioritizing military capability needs;
- identifying the key technologies and finding key industrial capabilities for preservation or development in Europe;
- consolidating demand;
- increasing investments;
- ensuring security of supply;
- and increasing competition, and co-operation.

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[82] The EDA, *An Initial Long Term Vision* (LTV), Brussels 03/10/2006. Accessed September 25, 2015. http://www.eda.europa.eu/genericitem.aspx?area=Organisation&id=146

[83] The EDA, *A Strategy for the European Defence Technology and Industrial Base*. Accessed September 25, 2015.
http://www.eda.europa.eu/docs/documents/strategy_for_the_european_defence_technological_and_industrial_base.pdf

Second, the *European Defence Research and Technology Strategy (EDRTS)*[84] in 2008 recognized strategic technologies and skills that needed to be preserved or further developed in Europe, and it additionally endorsed collaborative research and technology projects. The EDRTS was focused in addressing the R&T prerequisites of the CSDP in the field of crisis management.

Its main goal was to encourage more effective and common investments (through growing cross-border ownership of companies in the supply chain and the multi-lateralisation of collaborations) from part of Defence R&T stakeholders (pMS, industry & research suppliers, European Commission, NATO, OCCAR, ESA,...).[85]

The buzz word of 'creating *synergies* between civil and military activities'[86] was present back in the 2008 Strategy, as well as the special emphasis on 'disruptive technologies and emerging technologies.'[87] With the EDRTS, the general strategic lines for civil-military R&T hybridization were already set by promoting technology push[88] mechanisms, *i.e.* 'promoting awareness of civil technologies for defence purposes and developing technology roadmaps.'[89]

In this respect, in 2014, the EDA assumed the responsibility 'to map key European defence skills and competences, and to develop concrete recommendations to maintain key defence skills and competences across the defence sector'.[90] As regards strategy, the European Commission has started coordinating the EDA's work in the European Technology non-Dependence (ETnD) field. In terms of science and technology, the EDA's Capability Technology (CapTechs) networks have pinpointed key capabilities at risk that affect technologies, skills, know-how, and competencies.[91]

Third, the *European Armaments Cooperation Strategy*[92] in 2008 pursued the expansion of cross-border defence cooperation. All three strategies were based on the evidence that individually, not even the biggest EU countries were able to bolster national armament industries and to provide a broad range of cutting-edge weaponry at competitive prices.

It is actually difficult to conceptually grasp the EDA's role within an already crowded EU institutional setting. Is the EDA an agent of the Member States, is it a defence agenda-setter in its own right, a strategic actor, a policy entrepreneur or merely an EU-level control device? In essence, the EDA is all of the above, this multi-hat institution being responsible with a variety of tasks and objectives.

The investigation of the EDA displays the fact that Member States are the principals, establishing *ex ante* the scope of the EDA's actions, and also the supervision measures that

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[84] The EDA, *A European Defence Research & Technology Strategy*. Accessed September 25, 2015. http://www.eda.europa.eu/docs/documents/edrt_strategy.pdf

[85] The EDA, 'A European Defence Research & Technology Strategy' (November 10, 2015): 4. Accessed September 25, 2015. http://www.eda.europa.eu/docs/documents/edrt_strategy.pdf

[86] *Ibidem*, 2.

[87] *Ibidem*, 6.

[88] *Technology Push* (contrasted to market/demand pull) is part of a business strategy by which a new technological invention is pushed through R&D on the market without taking into account whether it is asked for user needs. The original idea can be attributed to renowned economist and political scientist Joseph Schumpeter and his book *The Theory of Economic Development* (1961).

[89] *Ibidem*, 8.

[90] The EDA, *Key Skills and Competences for Defence*, 16 Dec 2014. Accessed September 25, 2015. http://www.eda.europa.eu/what-we-do/activities/activities-search/key-skills-and-competences-for-defence

[91] *Ibidem*

[92] The EDA, European Armaments Co-Operation Strategy. Accessed September 25, 2015. http://www.eda.europa.eu/docs/documents/European_Armaments_Cooperation_Strategy.pdf?Status=Master

allow for *ex post* control. Applied to the EDA, a principal-agent examination subsequently leads to the conclusion that the agency's autonomy is expected to vary across issue-areas and over time, according to the EU Member States' interests and priorities.

Other questions arise: is the interest of the EDA indistinguishable from the interest of Member State, and is the role of the agency to be the simple proxy for them? The name of the EDA, incorporating the word 'agency', clearly establishes a hierarchy between the EDA and the Member States. Yet, an institution such as the EDA, once created, it tends to take an institutional life of its own, with the unintended consequence of constraining its original creators.

By adopting certain benchmarks, rules and regulations, and especially by putting forward strategic documents and overarching policy visions, the EDA has a degree of leveraging power over national defence agendas. Contrariwise, its control mechanisms over the Member States' policy compliance are weak, due to the fact that it has no sanctions for non-compliance and it completely lacks other tougher control mechanism.

The EDA is locked in an intergovernmental system and a unanimity voting pattern, the EU Member States being disinclined to yield further authority in the defence sector to the EU agency, even if it preserves all the markings of an intergovernmental organization. The EDA was initially created without a truly binding power and the collaboration among Member States is on a voluntary basis. The agency is increasingly gaining more responsibilities that raise the exits costs of the EU Member States significantly, as they become further engaged in certain patterns of defence collaboration.

After more than a decade since the EDA's creation, the conclusions from 19-20 December 2013 European Council meeting on defence recognized that the EU currently finds itself constrained by the same complex and growing security challenges that prompted the initial creation of the Agency. The security crises are coupled by increased economic structural pressures calling for the creation of a 'mean and lean' EU defence dimension. On top of that, crisis management missions require cutting-edge capabilities that ensure the overall protection of both soldiers and civilians involved in theatres of action.

There is an increasing necessity to pool Member States' efforts towards a common denominator in the defence field. The EDA has been set up with the exact purpose of coordinating the defence spending of Member States. As a top-down institutional approach and coordination at the EU level, the EDA has the role to address the issue of inefficient and inadequate defence spending, indicating the EU's intention to surpass the so-called 'capabilities-expectations gap.'[93]

The rationale behind the workings of the EDA speaks for itself, meaning that Member States have come to acknowledge that they cannot face alone the security challenges of the 21st century. On their own they lack not only the necessary military power to stand alone, but also they lag behind in terms of their uncompetitive defence industries.

Consequently, the political will has been reached at the EU level that the gains for collaborating under the umbrella of the EDA by far surpass the costs of non-cooperation. The December 2013 Council meeting, for the first time in seven years, substantially discussed European defence policy priorities and demonstrated that an emerging majority view among EU Member States was being formed concerning how their capability gaps can be filled collectively at a supranational level and at a time of decreasing defence budgets and economic austerity.

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[93] C. Hill, 'The Capabilities-Expectations Gap, Conceptualizing Europe's International Role,' *Journal of Common Market Studies* 31/3 (September 1993): 316.

Especially interesting was the emphasis on the research of dual-use technologies that provide stimulating opportunities for countries with smaller defence sectors and for civilian small and medium enterprises (SMEs) investments in the defence sector.

As the Minister of the Hellenic National Defence Dimitris Avramopoulos observed in his opening remarks to the EDA's 2014 annual conference, the EU Member States 'are already losing sovereignty by not consolidating, not optimizing, not innovating, not regionalizing and not integrating their military capabilities. Without these joint developments, they risk losing their 'strategic autonomy''.[94]

The institutional developments within the EDA have also created 'a unique structure that brings together each aspect of the defence process, from cooperation planning, through capabilities, research & technology, armaments cooperation, to industry and market, as well as wider European policies.'[95] Why then the slow pace of policy implementation and defence reforms?

From this point of view, the EDA's role in endorsing a common defence European Union agenda is paramount, being from this respect quite the idiosyncratic institution: 'a step forwards on the way towards a common armaments policy [and] also a measure to protect the *status quo*, an expression of stagnation.'[96]

Since 1 January 2014, the EDA has had a new and more streamlined organization structure to better support Member States[97], being reorganized in three operational directorates that allow the agency 'to anticipate and react rapidly to developments; maintain its operational output; facilitate the prioritization of tasks; and serve the needs, expectations and interests of Member States effectively and efficiently.'[98]

The EDA's three operational directorates, *i.e.* Cooperation Planning & Support; Capability, Armament & Technology; and European Synergies & Innovation, accompanied by certain rules and regulations, strategies and goals, all represent significant institutional lock-ins in formal cooperative structures at a European supranational level.

Nevertheless, it remains to be seen how the above policy and institutional steps at the EU level, coupled by an increasingly converging political will at the level of Member States are manifested in practice. At the implementation end, critical voices have been raised that there is not enough practical effort being made to meet the goals set-about by the December 2013 Council.

The Steering Board of 18 November,[99] chaired for the first time by the new Head of the European Defence Agency and High Representative, Federica Mogherini, was an important opportunity for Member States' Defence Ministers to assess the EDA's progress since December 2013.

It was also an ideal forum to prepare ahead for the June 2015 European Council and to discuss the advancements made in terms of military capabilities. Progress was observed in four key programmes: Air-to-Air Refuelling (AAR), Remotely Piloted Aircraft Systems (RPAS), Governmental Satellite Communications (GovSatcom) and Cyber Defence:

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[94] European Defence Matters, *A magazine of the European Defence Agency*, Issue 5, 2014, 17.
[95] The EDA's Organization. Accessed September 25, 2015. http://www.eda.europa.eu/Aboutus/who-we-are/Organisation
[96] Trybus, 'The New European Defence Agency,' 698.
[97] European Defence Matters, *A magazine of the European Defence Agency*, Issue 05, 2014, 23.
[98] *Ibidem*
[99] The EDA, Defence Ministers assess EDA progress during the Agency's Steering Board. Accessed September 25, 2015. https://www.eda.europa.eu/info-hub/news/2014/11/18/defence-ministers-assess-eda-progress-during-the-agency%27s-steering-board

'Air-to-Air Refuelling: under the lead of the Netherlands, work has been progressing towards the establishment of a European strategic tanker capability by 2020. A contract for new air-to-air refuelling aircraft has been expected to be placed by the end of 2015.

RPAS: the EDA supports the development of a European Medium Altitude Long Endurance (MALE) RPAS through a number of projects focusing on certification, air traffic insertion, airworthiness and harmonisation of flight crew training. The Agency is facilitating efforts to develop a new MALE RPAS capability for the next decade by supporting Member States willing to join such an initiative. The EDA is also backing a 'European MALE RPAS community' for systems that are already in service.

GovSatcom: the requirements of European military users (Common Staff Target) for the next generation of Governmental Satellite Communications have been formally endorsed by Member States. This could potentially pave the way for the preparation phase of a future cooperative programme, to be completed by the end of 2016 under Spanish lead.

Cyber Defence: in line with the EU Cyber Security Strategy, the EDA is working on specific projects to increase its Member States' capabilities in this domain. The Agency has already supported the operational headquarters of Operation EUFOR RCA by providing cyber awareness training. Work has been underway to develop deployable 'Cyber Defence situational awareness kits' by 2015.'[100]

The EDA has also developed proposal to incentivise cooperation, through non-market distorting measures and pooled procurement, as well as the adoption of Commission-backed Policy Framework for more systematic and long-terms defence cooperation:

'Fiscal measures: in March 2014, the Belgian Ministry of Finance granted VAT exemption to the EDA's *ad hoc* projects and activities. Three projects have already benefitted from that exemption: JDEAL, C-IED Manual Neutralisation Techniques and EU Satcom Market. This VAT exemption has given a real bonus to defence cooperation among Member States.

Pooled procurement: proposals were discussed for the establishment of a pooled procurement mechanism to facilitate cooperative acquisition and support of defence equipment, while improving interoperability. This mechanism, whose creation still requires deeper discussion among Member States, would address priorities defined by them.

Policy Framework: the already-mentioned document is aimed to provide a coherent basis for defence cooperation in Europe, from priority setting to in-service support, disposal and decommissioning. It offers tangible support to national defence reviews and provides a platform for greater convergence in defence planning.'[101]

A revised Capability Development Plan (CDP) was put forward to complement the Policy Framework so as to prioritize actions in cooperative capability development based from lessons learned from European operations and future security scenarios and it had become the 'basis of future European collaborative programmes.'[102]

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[100] *Ibidem*

[101] *Ibidem*

[102] *Ibidem*

The Civilian / Military Nexus and Dual-Use Technologies – European Research at a Crossroads

The civilian and military *nexus* and its relation to the European defence capability build-up, as reflected by the practical steps accomplished by the EDA, could shed further light on:

- the nature of the EU's military capability development;

- the EU's security projection at home and abroad;

- and the different technologies of defence it employs in its internal and external civilian and military action.

The growing importance of civilian R&D and the success of civilian technology production within the EU are mainly due to major increases in private-funding and civilian spending of large private companies (for example, in the fields of electronics, IT, biotech) with budgets rivalling those of smaller EU Member States.

Moreover, the unmistakable move from military R&D to the civilian industry at the EU level is also accounted for by the blurring lines of traditional military and national technology cultures, as well as a general change in civilian and military relations.

By analysing the relationship between the defence and the civilian dimensions as proposed and conceptualized mainly within the framework of the EDA, the interest is to problematize the incorporation of civilian technologies and techniques in the defence field. The contested relation between defence, technology and economy also needs to be addressed and the concept of dual-use technologies requires further unpacking and understanding.

The demotion of the military dimension can also be observed, from *the* principal instrument of warring to *one among other* instruments. The EU's progressive take on matters of security and defence should be duly acknowledged, but several alternative readings should be taken into account as well, especially concerning the civilian/military relation and how it is further reflected in the EU's defence identity.

The European defence transformation could be better understood as two-dimensional expansive moves: from a traditional understanding of defence to its conflation under the larger umbrella of the security concept and, through appropriating civilian technologies and practices under the remit of strategic imperatives and security priorities.

While the first expansive move could be extensively attribute to the changing role of military forces after the Cold War and the demise of the internal/external dimensions of national security and defence, the second one is more problematic and it is often taken for granted by policy makers. The relegation of the civilian technologies and practices under military imperatives is found unproblematic, as civilian R&D is uncritically looped under the dimension of defence and re-read in the grammar of security and defence strategies.

Equally, the defence sector becomes yet another civilian player on the international market, competing not only for human capital but also for resources (technology, intelligence, economic capital, and research edge). By privatizing the defence sector and by putting it under the umbrella of the European Union's liberalized market, the defence sector

becomes a private player in the market, functioning under the logic of globalizing and regionalizing economic forces.

The process of appropriation, fusion and diffusion of practices and technologies between civilian and military dimensions is challenging from several points of view. This conceptualization of European defence in line with the EU's programmatic documents such as the Long-Term Vision issued by the EDA expose defence appropriation practices motivated by economic interests.

According to such policy outputs, the European defence development will draw from the broadening flood of civilian technological progress, thus reversing the traditional logic of outflow from military technological innovation into the civilian realm. Such spill-overs, spin-offs or spin-ins in the realm of civilian technological R&D will contribute to the creation of cutting-edge and competitive EU defence technologies on the international market.[103] In point of fact, the civilian technology sector is now far larger and more apt to capitalize on technological advances and to meet the requirements of customer demand.

Consequently, cutting-edge innovation is more likely to come from the civilian sector rather than from defence R&D and R&T.[104]

Technology could be construed as an object in itself, neither civilian nor military, independent from specific socio-economic and political realities that engender its potential dual use. On the contrary, more constructivist interpretations posit that technology is not socially or politically neutral,[105] with clear-cut normative consequences that are dependent upon specific historical contexts. The end of the Cold War brought about such realities and triggered reforms and restructuring processes of technological policies by reorienting the former military industrial military complex and by redefining the problematic relations between defence-related R&D spending and civilian technological development.

Most of the Western EU Member States reoriented their national defence R&D expenditure towards non-defence technological investments, while at the same time giving greater importance to dual-use technologies. The underlying goal with dual-use technologies is to create a shared military and civilian R&D contribution and a common technological 'pool' from which both realms can draw from.

The concept of technology has a highly contested meaning and implies a general lack of consensus concerning its definition. This could range:

- from a more narrow, materialist and practice-oriented understanding of strictly speaking technological products;

- to a more substantive conceptualization including the social relations/context, knowledge and modes of production responsible with the creation of such technological artefacts.

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[103] C. Kollias, N. Mylonidis & S. Paleologou, 'A Panel Data Analysis of the Nexus Between Defence Spending and Growth in the European Union,' *Defence and Peace Economics* 18/1 (February 2007): 75-76.

[104] A. Husniaux, Major-general Belgian Air Force, NATO Chief Scientist, 'Three challenges for developing dual-use synergies,' Friends of Europe (July 10, 2015). Accessed September 25, 2015. http://www.friendsofeurope.org/security-europe/three-challenges-developing-dual-use-synergies/

[105] M. B. Rao, J. Jongerden, P. Lemmens & G. Ruivenkamp, 'Technological Mediation and Power: Postphenomenology, Critical Theory, and Autonomist Marxism,' *Philos. Technol.* 28 (2015): 450.

The politically-laden concept of dual-use as applied to technology brings about further complexities:

- questioning the very concept of 'dual-use technologies', since technology *per se* is neutral;[106]

- legal and psychological barriers between civilian and military research;[107]

- dual-use technologies as a smokescreen to justify further defence cuts;[108]

- the potentiality for duality seen in terms of reconverting certain existing technologies;

- the dualism understood as different stages in the life-cycle of technological production;

- different types of R&D programs, due to civilian or military funding sources;

- and different production and strategic objectives, triggered either by economic-driven imperatives or security concerns.

At a time when national defence R&D and R&T budgets are shrinking, several initiative have been put forward so as to tackle this critical challenge through increased cooperation at the EU-level.[109] New funding opportunities have been made available for dual-use oriented research[110] under the European Structural Funds, in a bid to respond to the economic crisis and the budget austerity cuts in Europe.

According to Ms Silvija Guzelyte, the EDA Project Officer Defence & Industry Analysis, R&D expenditure increased slightly in 2013 to €7.5 billion, amounting to 4% of the total defence expenditure, while R&T as a subset of R&D, increased by just over 3% from 2012 to 2013 to €2.1 billion.[111] Notwithstanding the increasing trend, these figures need to be contrasted and analysed against a set of collective benchmarks for investment settled upon by the EDA Member States in 2007, according to which defence R&T should reach 2% of the total spending and not amount to just 1.12% like in the case of 2013.[112]

The EU Member States still preserve a strategic advantage in terms of military capabilities due to investment made a decade or two ago, but this reality is under increased threat. The much discussed security autonomy of the EU is to be preserved through major investment in R&D and especially emerging technologies, in particular in the case of dual-use research.[113]

s previously mentioned, there is an undeniable technology push (Schumpeter) for dual-use research and for using European structural funds for dual-use projects by involving

[106] Husniaux, 'Three challenges for developing dual-use synergies,' July 10, 2015.

[107] Madame Claude-France Arnould, former Director of the European Defence Agency, 'Three ways to reindustrialise Europe with dual-use technologies,' Friends of Europe (January 9, 2015). Accessed September 25, 2015.
http://www.friendsofeurope.org/security-europe/three-ways-reindustrialise-europe-dual-use-technologies/

[108] D. Fiott, 'Dual-use technologies don't justify decreasing defence budgets,' Friends of Europe (July 17, 2015). Accessed September 25, 2015. http://www.friendsofeurope.org/security-europe/dual-use-technologies-dont-justify-decreasing-defence-budgets/

[109] European Defence Matters, *A magazine of the European Defence Agency*, Issue 7, 2015, 10.

[110] The EDA, Factsheet European Structural Funds for dual-use research (December 18, 2013). Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/publications/publication-details/pub/factsheet-european-structural-funds-for-dual-use-research

[111] European Defence Matters, *A magazine of the European Defence Agency*, Issue 7, 2015, 16.

[112] *Ibidem*

[113] Crespo, '3 Ways to put Dual-use Technologies,' 2015.

the European defence industry in general and defence-related SMEs in particular. Dual-use research is considered to be the much needed *élan vital* of Europe's defence and security sectors[114] and it is considered to be at the heart of the defence industrial policy by the European Commission. The European Commission defines dual-use items as 'goods, software and technology normally used for civilian purposes but which may have military applications.'[115]

In this respect, the EDA has opened the Pandora's Box of the EU's massive Structural Funds (SF) so as to support the European defence industry. The success story of the TURTLE project,[116] the first of seven dual-use research initiatives supported by the EDA, was streamlined by the Portuguese authorities and tapped around 60% financing from the European Structural Funds. It aims to develop key 'enabling technologies for sustainable and long term presence in the ocean.'[117]

European SMEs or subsidiaries of major defence producers (prime and sub-contractors) have now the opportunity to access European Structural Funds to fund for dual-use activities in research and innovation, as part of national or regional smart specialisation strategies.[118] From this perspective, SMEs could benefit from the considerable potential for synergies between civil and defence research, and significantly contribute to the future industrial competitiveness of the EU. While the declaratory output coming from the European Defence Agency and the European Commission concerning the pivotal role played by SMEs as the backbone of the European economy,[119] recent statistic display a different scenario, with a slow number of European SMEs producing in-house innovation or collaborating with counterpart on innovation projects. The main reason consists in logistical limitations, SMEs often lacking in know-how, capacities and organisational resources.[120]

At the beginning of 2015, the European Defence Agency has launched a new Request for Project (RFP)[121] on dual-use technologies: the initiative is aimed to identify innovative dual-use research and technology projects which could be funded by European Structural and Investment Funds (ESIF). This new procedure has been built on the successful EDA pilot call launched in 2013, which led to the selection of project 'Turtle'. The Turtle Project has thus pioneered the EDA's strategy to stimulate dual-use technologies by accessing the European Structural Funds and by involving SMEs in joint defence research projects.

Reaping the benefits of dual-use technologies and dual-use research and production projects appears to be the way ahead and the solution for stimulating a dormant European defence industry and market.

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[114] *Ibidem*

[115] The European Commission, Trade, Dual-use controls. Accessed September 25, 2015.
http://ec.europa.eu/trade/import-and-export-rules/export-from-eu/dual-use-controls/

[116] First EDA Supported Dual-Use Project, The Turtle Project. Accessed September 25, 2015.
http://www.eda.europa.eu/info-hub/news/press-releases/2014/02/06/first-eda-supported-dual-use-project-receives-european-structural-funds

[117] *Ibidem*

[118] The EDA, European Structural Funds for dual-use research, Fact sheet (December 12, 2013).
http://www.eda.europa.eu/docs/default-source/eda-factsheets/2013-12-12-factsheet_esf_highF224968C0825

[119] T. Lämmer-Gamp, 'Using cluster programmes to boost SME involvement in R&D,' Friends of Europe (August 18, 2015). Accessed September 25, 2015. http://www.friendsofeurope.org/security-europe/using-cluster-programmes-boost-sme-involvement-rd/

[120] *Ibidem*

[121] The EDA, New funding opportunity for dual-use research (February 15, 2015). Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/02/16/new-funding-opportunity-for-dual-use-research

Conversely, the main selling point put forward by the EDA is that such cross-fertilizations between civilian and military R&D are economically profitable and that the military and the defence sectors can become a stimulating force to the civilian industry and market, for instance by employing labour force or by just prompting technological spin-offs in the civilian dimension.

Differentiating between civilian and military platforms and products has become more and more difficult, due to the blurring of civilian and defence industrial bases and the proliferation of products with uncertain dual-use characteristics.[122] This phenomenon further complicates items related to technology transfers and exports, as well as EU export control systems and dual-use export legislation. As underlined by Madame Claude-France Arnould, former Director of the European Defence Agency, 'If we want the civilian and defence worlds to effectively cross-feed each other, then it is necessary to proceed with the desegmentation of civil and military research. By allowing funding to flow from one side to the other, major spin-offs between defence and civil research could be achieved.'[123]

Indeed, a hybrid civilian-military industrial base could be the much needed solution for the current economic crisis and the EU's capabilities-development gap as regards security and defence, but there are still risks attached to dual-use research, such as differing strategic goals for product design and profit.

There still remains the problem of siphoning off an increased segment of civilian technical resources and skills to military applications, as well as establishing general standards and patterns of technology transfer from civilian to military applications or *vice versa*.

Not to mention the fact that the diversification process is not as straight-forward as it may seem, due to the high level of secrecy requirements intrinsic to the military and defence realm and the sometimes classified nature of military technological development. Therefore, the dual-use approach diversification cannot be applied to all defence industry products, due to the confidentiality limitations of key strategic technologies[124] that do not have civil application.

The basic strategic principles, the nature of the demand, the commercialization patterns, the technological preferences, and the performance requirements[125] differ extensively in the case of civilian and military R&D. Such processes give birth to new patterns of governance and new civilian-military relations. These implications further lead to merging strategic goals as regards defence research and development.

While the democratic civilian control of the armed forces is important and necessary to keep in check the national military dimension, the EU-level recent engagement of the defence sector adds an additional element of pressure in the governance of defence. Keeping defence under national politics has always secured a primacy of the civilian realm, but by

[122] Friends of Europe, 'Dual-Use Technologies in the European Union. Prospects for the Future,' *Discussion Paper* (Autumn 2015). Accessed September 25, 2015.
http://www.friendsofeurope.org/media/uploads/2015/09/FoE-Dual-use-Discussion-paper-WEB.pdf
[123] Madame Claude-France Arnould, former Director of the European Defence Agency, 'Three ways to reindustrialise Europe with dual-use technologies,' Friends of Europe (January 9, 2015). Accessed September 25, 2015.
http://www.friendsofeurope.org/security-europe/three-ways-reindustrialise-europe-dual-use-technologies/
[124] Jean-Luc Logel, 'The dual-use technologies where defence and industry interests merge,' Friends of Europe (July 22, 2015) Accessed September 25, 2015.
http://www.friendsofeurope.org/security-europe/dual-use-technologies-defence-industry-interests-merge/
[125] The effects of Military Technology. Accessed September 25, 2015.
http://archive.unu.edu/unupress/unupbooks/uu38ne/uu38ne0a.htm

reintegrating the defence sector and by re-branding it as 'civilized' or dual-use does not necessarily guarantee civilian supremacy and oversight.

The defence industries in the EU have been able to work around some of the national limitations on the export of certain secret defence products and technologies and to mitigate the encounter of political barriers and civilian oversights at both national and EU level. National parliaments, civil society, and the European Parliament play a fundamental role in securing the much needed accountability and democratic control of the above developments.

Greater defence capability integration is difficult because of national sovereignty issues and the limitation of economic resources, but there are undeniable opportunities derived from a hybrid civilian-military industrial base. The goal would be the production of more dual-use capabilities for lower costs and a broader applicability.

This is all truer because of the development of 'smart' weaponry, which will need a significant input of resources, currently limited at the EU level and subjected to burgeoning demands from other areas and sectors. An agenda to generate new capabilities through greater integration on a supranational level and the hybridization of civilian-military R&D could be one way ahead, without however disregarding the potential implications intrinsic to such processes and the risks of civilian R&D exploitation.

The decision to invest in dual-use technologies could be construed at an instance of EU *technopolitik*[126] at work, reflecting a top-down technocratic agenda (Mathew Evangelista) in search for out-of-the-box solutions to revamp the European defence industry and market, such as initiating 'contacts with the European Investment Bank to investigate potential financial support to the defence industrial sector through cooperative programmes of a dual-use nature.'[127]

Accordingly, it comes as no surprise that dual-use is the *à la mode* term in Brussels nowadays. What Mary Kaldor meant by baroque technology seems to apply to the above: 'decisions about what constitute technical advance are necessarily subjective. They tend to be taken by people who make and use the weapons systems, whose ideas are necessarily shaped by institutional experience and interest in survival.'[128] They are an expression of a convergence of interests from the part of industrial, military and political elites at the European level to prioritize a certain policy for dual-use technologies.

Thus, it could be argued that representatives of transnational, European armament firms, EU military leaders and Brussels-based personnel have witnessed a 'confluence of interests between arms manufacturers and the military establishment,'[129] as well as with the EU bureaucracy. The EDA could be seen as a melting pot of interests, gathering under its institutional umbrella different actors with their own utility maximizing agendas, being both the agent of these actors but also a centre of decision making. However, one should not forget that the ultimate shareholders in the decision-making process of the EDA remain state actors, with the military, the economic sector, or the EU bureaucrats acting as lobby groups and important stakeholders in the decision-making process.

Rules have generally prohibited the EU to tap research grants under the 'Horizon 2020' or the FP7 schemes for the specific funding of military and defence projects. The

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[126] D. Fiott, ''Technopolitik': Europe, power and technology,' *European Geostrategy* (July 19, 2015). Accessed September 25, 2015. http://www.europeangeostrategy.org/2015/07/technopolitik-europe-power-and-technology/
[127] D. Fiott, 'Interview with Jorge Domecq,' *European Geostrategy* (July 15, 2015). Accessed September 25, 2015. http://www.europeangeostrategy.org/2015/07/interview-with-jorge-domecq/
[128] M. Kaldor, *The Baroque Arsenal* (London: Andre Deutsch, 1982): 18-19.
[129] D. Smith and R. Smith, *The Economics of Militarism* (London: Pluto Press, 1983), 41.

concept of dual-use technologies manages to circumvent such rules, covering equipment development for both civilian and military objectives.

EU defence companies have benefitted from hundreds of millions in EU research grants for the research and development of drones for example, in spite of regulation against using such grants for military purposes and projects. Far from being a victim of the economic crisis, the European arms industry has benefitted from lucrative deals and EU-funded subsidies.

Statewatch, a London-based civil liberties watchdog, outlined in a report that over €315 million of EU research money has been directed in the past years for major European military projects. The defence industry and major weapons manufactures such as Selex, Airbus Group (ex-EADS), Dessault Aviation, Finmeccanica Thales, and Sagem are among the main beneficiaries of such EU funding.

Is investment in dual-use technologies an instance of creative financing for 'soft' capabilities with the potential of being transformed in 'hard' ones, such as the case of civilian-military hybrid drones? Or is this strategy actually a reflection of the EU's incapacity to engage in serious funding for hard defence capabilities? Which are the principal innovations in the EU's drone policy evolution from the 2000s onwards?

The Case of Hybrid RPAS or Funding for European Defence by Stealth

Unmanned vehicles or so-called 'drones' have recently become major force multipliers in conducting 'smart' warfare, surveillance missions, and more generally intelligence gathering. By both reducing boots on the ground in civil and military operations and by providing reliable data through competitive surveillance capacities at affordable costs, drones have caught the attention of political decision-makers, the defence industry, and military planners alike. Drones are seen as the next step in revolutionizing 21st century security-making. In recent years, drones have arguably enjoyed significant successes in effectively countering terrorist threats by protecting soldiers and limiting the number of civilian deaths in theatres of action.

A drone or a remotely piloted aircraft (RPA) is a 'pilotless aircraft remotely flown via radio or satellite communications links. They can be either fixed – or rotary-winged and, primarily, they provide intelligence, reconnaissance and surveillance (IRS) capabilities: through their on-board sensors, they capture various types of information which are later processed at ground installations.'[130] Drones are typically aircraft, although there are several land and sea-based pilotless vehicles under development.

Drones operate under different labels and signifiers, from unmanned aerial vehicles (UAVs), remotely piloted vehicles (RPVs), or in concurrence with their ground-based control stations, *i.e.* unmanned aerial systems (UAS) or remotely piloted aerial systems (RPAS). The vague and neutral wording of 'remotely piloted' is much preferred in the current debate, due to the fact that it circumvents the emotional negative baggage attached to the US 'drone strikes' on the one hand, and the worrying concerns regarding pilotless vehicles (uncontrollable, robotic, unaccountable) attached to the term 'unmanned' on the other hand. Drones are the type of technology that begets an unusually large number of categorical ambiguities. Nevertheless, to paraphrase the Shakespearean quote, 'What's in a name? That which we call a *drone* / By any other name would smell as sweet', drones will be drones, notwithstanding their more *à la mode* and innocuous RPAS denomination.

The majority of drones are unarmed, but the technological trend is progressively preferential towards dual-use and the fast and easy weaponisation of drones, from the smallest platforms to the largest ones. At least 16 out the 28 EU Member States[131] are already in the possession of both military drones for combat and reconnaissance purposes and non-military drones designed for surveillance and detection purposes.

There are of course clear and justifiable legitimations for drone use, such as environmental or disaster relief in humanitarian responses, however there is also to consider the dark side of the technology, namely warfare and social or crowd control affecting the privacy and freedom of citizens.

The classification of drones is predominantly dependent upon two major factors, their undeniable technological evolution as an archetype of modular innovation[132] and the political/doctrinal and strategic interests attached to them. Nevertheless, three criteria rank

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[130] A. Gilli, 'Drones for Europe,' European Union Institute for Security Studies (September 2013): 1. Accessed September 25, 2015. http://www.iss.europa.eu/uploads/media/Brief_29.pdf
[131] B. Hayes, C. Jones, and E.Töpfer , Statewatch Report, 'Eurodrones Inc.' (February 2014): 7. Accessed September 25, 2015. http://www.statewatch.org/news/2014/feb/sw-tni-eurodrones-inc-feb-2014.pdf
[132] Gilli, 'Drones for Europe,' 3.

highest in the grouping of RPAS, namely the level of their autonomy, the altitude they can reach, and the amount of distance or range they can cover.

Of course, their dimensions and weight play an important role as well, but they are usually determined by the first three criteria – considering the fact that their airlift capacity and source of energy are demarcating the drones endurance and array of actions in the field. Another important difference is the drone's capacity to fly entirely autonomously or to be piloted from a distance.

All in all, drones can be classified in three general families:

- tactical drones: micro drones or micro air vehicle (MAV); very short range drones; slow medium multi changes multi mission drones (MCMM); fast low altitude drones (fast MCMM); tactical maritime drones;

- medium altitude long endurance drones (MALE);

- and high altitude long endurance drones (HALE).

Three types of drones are of particular interests: surveillance drones (both MALE and HALE, respectively) and unmanned combat aerial vehicles (UCAVs).

Table II Classification of RPAS[133]

Type	Range/Altitude/ Endurance	Examples of fixed wings (company)	Examples of rotary wings (company)
Medium Range	300km/4,500m/ 20 hours	Sperwer-B (Sagem), Watchkeeper (Elbit/Thales),	Fire Scout (Northrop Grumann)
Medium Altitude Long Endurance (MALE)	1,150km/15,000m/ 14-24 hours	Predator A (General Atomics), Hermes 1500 (Elbit Systems)	Snark (TG Helicorp)
High Altitude Long Endurance (HALE)	14,000km/18,000m/ 28-36 hours	Global Hawk (Northrop Grumman)	
Combat (UCAV)	4,000km/12,000m/ several hours (5-10)	nEUROn (Dassault), X-47B (Northrop Grumman)	

The use of drones in combat situations has also triggered a number of ethical and *jus in bello* concerns,[134] especially in instances where chain-of-command decisions on drone strikes raise questions of transparency, discrimination, and proportionality. The use of weaponized military drones or armed unmanned aerial vehicles – 'hunter-killer drones'[135] in contemporary conflicts is argued to have changed the style of warfare, the employ of robotic technology in combat situations calling for a new ethical framework for conducting war.

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[133] Table from Gilli, 'Drones for Europe,' 2.
[134] D. Brunstetter & M.Braun, 'The Implications of Drones on the Just War Tradition,' *Ethics & International Affairs* 25/3 (Fall 2011): 337-358.
[135] C. Enemark, *Armed Drones and the Ethics of War: Military Virtue in a Post-heroic Age* (Routledge, 2013).

Drone fighting, like other long-range fighting, needs to take into account several ethical implications: this practice is conducive to easier kills by creating both physical and moral distance[136] when engaging opponents in conflict situations. This double-distance is translated in the so-called 'screenfighting'[137] and the bureaucratization of killing,[138] which implies the lack of human empathy and the removal of moral and psychological barriers to killing. While drone technology can be employed with little risks and costs, the fighting process involves worrying de-humanising practices redolent of computer war games.

The use of drones may introduce cost-effective advanced technologies to warfare, but similar to other types of remote warfare,[139] they offer a military solution to more complex insecurity problems. As is was argued by American philosopher Herbert Marcuse in his book, *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society* (1964), the choice between a technical rather than a socio-political solution to social problems is highly significant from a normative point of view.

Questions arise concerning the accuracy and reliability of such technologies to identify an appropriate target, further complicated by public trust issues in government and military officials responsible with drone strikes decisions. To address such concerns, several principles inherent to *jus in bello need to be codified:*[140] *the principle of military necessity, the principle of distinction (between soldiers and civilians), the principle of proportionality (the use of force must be proportional to the military objectives to be achieves), and lastly and probably the most important one, the principle of humanity (the military force must avoid civilian suffering and casualties, and the destruction of propriety). The legal issues associated with drone strikes generally refer to the United Nations Security Council Resolutions 1373 and 1973, the former centred on post September 11 counter-terrorist operations, and the latter on military operations and interventions in Libya during the Gaddafi regime overthrow.*

The surveillance capability of unarmed and camera-equipped aerial drones allows for a wide range of both military and civilian tasks: data gathering, 'border monitoring, assessing damage to critical infrastructure (e.g. nuclear power plants), guiding search and rescue workers at natural disaster sites, monitoring weather patterns, searching for persons missing in difficult terrain, and tracking the spread of large-scale fires.'[141]

1. The EU's Drone Policy

Bridging the structural-innovation gap in defence technologies is one way forward to assure the EU's future normative autonomy in 'an increasingly, connected, contested and complex world.' The recent increased emphasis on dual-use technologies goes hand in hand with the above-mentioned blurring of lines between 'civilian *versus* military' or 'homeland

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[136] M. Coeckelbergh, 'Drones, information technology, and distance: mapping the moral epistemology of remote fighting,' *Ethics and Information Technology* 15/ 2 (June 2013): 87-98.
[137] *Ibidem*
[138] P. M. Asaro, 'The labour of surveillance and bureaucratized killing: new subjectivities of military drone operators,' *Social Semiotics Special Issue: Charting, Tracking, and Mapping* 23/2 (2013): 196-224.
[139] E. Kersley, 'Learning the lessons: 11 years of drones in Pakistan,' *openDemocracy* (June 19, 2015). Accessed September 25, 2015. https://www.opendemocracy.net/esther-kersley/learning-lessons-11-years-of-drones-in-pakistan
[140] E. Freiberger, 'Just War Theory and the Ethics of Drone Warfare,' *E-International Relations* (July 18, 2013). Accessed September 25, 2015.
http://www.e-ir.info/2013/07/18/just-war-theory-and-the-ethics-of-drone-warfare/
[141] *Ibidem*, 2.

versus external security', and drone-based technology plays a significant role in securing the European defence industry's competitive niche.

In an effort to catch up with major competitors such as the US, China,[142] Israel, and even the Middle East, the EU has made notable efforts to fund for civilian drone projects that concomitantly benefit the military advancement of drones, with 'at least €315 million of EU research funding directed at drone-based projects; of this almost €120 million has gone towards major security research projects.'[143]

The EU's development of its own brand of drones is used as an in-depth study case for the purpose of tracing and signifying the defence reform processes engendered by the EU and the EDA in terms of dual-use technologies. As interoperability is the key word concerning the advance of hybrid unmanned vehicles within the EU, priority is being given to the development of low-cost multi-purpose technologies for civilian and for military purposes.

The EU institutions have also been working on streamlining and eliminating regulatory and technological barriers restricting the flight of drones in civilian airspace – the European Commission published in June 2013 a roadmap,[144] 'Roadmap for the integration of civil RPAS into the European Aviation System'. This document paves the way for the safe integration of RPAS into the European airspace starting from 2016.

The bellow Table charts the EU roadmap and drone policy evolution from 2005 to December 2013. It reflects the European Commission's dedicated and long-term strategy to introduce drones into civilian airspace. The EU's drone policy has grown into a comprehensive action plan spearheaded by the EDA and the European Commission to eliminate the regulatory and technical barriers that at present limit the flight of drones in civilian airspace.

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[142] China has developed a MALE class drone, named Pterodactyl, *i.e.* 'The Chengdu Pterodactyl I is a Medium-Altitude Long-Endurance (MALE) unmanned aerial vehicle (UAV), developed by the Chengdu Aircraft Industry Group in the People's Republic of China.' Accessed September 25, 2015.
http://www.uavglobal.com/pterodactyl/
[143] Eurodrones, Inc. – Report (February 5, 2014). Accessed September 25, 2015.
https://www.tni.org/en/eurodrones
[144] Remotely Piloted Aircraft System (RPAS). Accessed September 25, 2015.
http://ec.europa.eu/enterprise/sectors/aerospace/uas/

Table III Roadmaps and EU drone policy evolution[145]

Roadmaps and EU drone policy

Year	Roadmap title	Funder(s)	Authors
2005	European Civil Unmanned Air Vehicles - Road-map,[37] Action Plan,[38] Strategic Research Agenda	FP5 (UAVNET, CAPECON, USICO)	25 partners led by Israel Aerospace Industries including Augusta-Westland, Airobotics, Alenia, Marconi, BAE, Onera, EADS, SNECMA, Eurocopter, Tadiran, Thales & Sonaca
2008	Study Analysing the current activities in the field of UAV: Way forward[39]	DG Enterprise	Frost & Sullivan
2008	Roadmap for the seamless integration of UAS within General Air Traffic by 2015[40]	EDA	Air4All consortium: Alenia Aeronautica, BAE Systems, Dassault Aviation, Diehl BGT Defence, EADS-Cassidian, Selex Galileo, QinetiQ, Rheinmetall, Saab, Sagem, Thales
2010	Regulatory Roadmap for UAS Integration[41]	FP6 (INOUI)	DFS, ISDEFE, Boeing, Rheinmetall & Innaxis
June 2013	Roadmap for the integration of civil Remotely-Piloted Aircraft Systems into the European Aviation System;[42] A Regulatory Approach for the integration of civil RPAS into the European Aviation System[43]	European Commission	European Remotely Piloted Aerial Systems Steering Group (includes industry representatives from Global Aerospace, Safran, Indra, EADS-CASA, Alenia Aermacchi, and UVSI)
December 2013	Master plan relative to the insertion of remotely piloted aircraft systems in (RPAS) in the European air transport system	FP7 (ULTRA)	A2Tech, Boeing, Honeywell, NLR, Studio Legale, Cranfield, Indra, Onera, Blyenburgh & Co, DFS, Integra, Thales

Consequently, the European Defence Agency has been able to forge a single collaborative defence input into the European Commission's Single European Sky programme, which works towards introducing Remotely Piloted Aircraft Systems into operational airspace, optimizes and increases Europe's scarce air-to-air refuelling resources, assists in developing a core multi-national air transport capability and increases Member States' access to vital space-based communications facilities.[146]

The Single European Sky (SES) has called for higher Air Traffic Management (ATM) civil-military coordination and interoperability in order 'to increase the ATM performance while maintaining the military's freedom to operate its various missions assigned by its national authorities. The degree of coordination will depend of the situation (peace/war), the nature of the fleet (transport/combat fighter/rotorcraft) and the operational concepts in place within European nations.'[147]

SESAR[148] (Single European Sky ATM Research) is the technological pillar of the Single European Sky and the air traffic management research programme and has been intended to facilitate the coordination between military views on the Single European Sky (SES) and technological projects aimed at their civilian implementation. The European ATM Master Plan[149] is the roadmap driving the modernisation of Air Traffic Management and governing the transition from European Single Sky ATM Research (SESAR) to deployment. In support of this process, high level coordination and consultation mechanisms have been put into place between the European Defence Agency, NATO, and EUROCONTROL so as

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[145] Statewatch Report, 'Eurodrones Inc.', 14.

[146] European Defence Matters, *A magazine of the European Defence Agency*, Issue 8 (2015): 11.

[147] The EDA News - Sharing European skies (Brussels, August 3, 2015). Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/08/03/sharing-european-skies

[148] SESAR Project. Accessed September 25, 2015. http://ec.europa.eu/transport/modes/air/sesar/index_en.htm

[149] The European ATM Master Plan. Accessed September 25, 2015. http://ec.europa.eu/transport/modes/air/sesar/european_atm_en.htm

to create better synergies between military airspace users and EU-based navigation service providers.

The mainly intergovernmental and non-EU organisation, the European Space Agency, has also been widely involved with the European Defence Agency and the European Commission in establishing reliable satellite communications links and in easing drones' insertion into civilian airspace.

In the last years, no less than € 315 million of the EU's research funds have been granted to drone-development projects, 'many of which are subsidising Europe's largest defence and security industries and are geared towards the development and enhancement of tools for border surveillance and law enforcement.'[150] The European Defence Agency as well has been advocating and funding the development of military drones with the new European Medium Altitude (MALE) drone project, supported by the defence ministries of EU Member States. Several examples of EU-funded projects for drone development are worth highlighting; they are part of a wider EU-driven agenda to find lucrative 'civil-military synergies' and enhance the EU's capability for 'power projection':

TALOS[151] – transportable autonomous patrol for land border surveillance funded with €13 million EU money and in collaboration with Aerospace Industries, a leading manufacturer of lethal drones. 'TALOS is an international research project co-funded from EU 7th Framework Programme funds in Security priority. The main objective of TALOS project is to develop and field test the innovative concept of a mobile, autonomous system for protecting European land borders. The conventional border protection systems are based mainly on expensive ground facilities installed along the entire length of the border complemented by human patrols. The system developed within the TALOS project will be more versatile, efficient, flexible and cost effective.'[152] However, the motivation and phrasing justifying the TALOS project[153] are mind-blowing, principally because they advance a technological answer – the drone, to deeper socio-economic questions. Among the enumerated reasons, it lists the dangerous character of the Eastern borderline with the former Soviet Union and the dramatic changes it has incurred due to the latest EU accessions of Central and Eastern European countries: the 'probability of occurrence and intensity of illegal activities, […] illicit trafficking, […] illegal migration, […] human trafficking and smuggling.'[154] The argumentation is followed by instances of good *versus* bad reasoning that are meant to dichotomise and are suggestive of 'Fortress Europe' type of rationale: 'This part of the eastern EU frontier is a buffer between the relative prosperity of the West and the poverty of the former Soviet Republics'.

Project **SUNNY**[155] – gathering 18 European companies and research labs from different Member States that will test for 42 months networks and sensors for drones to be used by unmanned aerial vehicles for maritime surveillance, the detection of illegal vessels carrying illegal immigrant and drug traffickers, and monitoring the coast. 'The SUNNY project aims to develop system solutions capable of improving the effectiveness of the EU border monitoring compared to the legacy systems whilst keeping affordability and

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[150] Statewatch Report, 'Eurodrones Inc.', 28.
[151] Talos. Accessed September 25, 2015. http://www.talos-border.eu/
[152] General Information about the TALOS Project,. Accessed September 25, 2015.
http://www.talos-border.eu/index.php?option=com_content&view=article&id=52&Itemid=60
[153] Motivation behind the TALOS project. Accessed September 25, 2015.
http://www.talos-border.eu/index.php?option=com_content&view=article&id=52&Itemid=60
[154] *Ibidem*
[155] Project SUNNY. Accessed September 25, 2015. http://www2.inescporto.pt/crob-en/noticias-eventos/nos-na-imprensa/ue-quer-testar-drones-na-vigilancia-de-fronteiras-maritimas

interoperability as key enabling factors. The SUNNY project will develop an aerial sensor network with improved sensor and data transmission capacities and real time data processing capabilities.'[156]

Perseus[157] – has been designed as a safeguard of European sea and borders through the intelligent use of maritime surveillance. 'PERSEUS is an FP7 demonstration project supported by the FP7 Security Research theme under DG-Enterprise. Its purpose is to build and demonstrate an EU maritime surveillance system integrating existing national and communitarian installations and enhancing them with innovative technologies.'[158]

Seabilla[159] – Sea Border Surveillance, which aims to define the architecture for cost-effective European Sea Border Surveillance systems, integrating space, land, sea and air assets, including legacy systems. 'SeaBILLA involved from the beginning experienced operational users belonging to a European multi-national Agency (MAOC-N) and Sea Border Authorities from Member States (Italy, France, Spain, The Netherlands, UK) today on the front line of the struggle against border infringements and maritime security.'[160]

EADS Talarion – European drone model[161] was a medium altitude long endurance (MALE) unmanned air vehicle (UAV) designed and manufactured by the former European Aeronautic Defence Space (EADS), now the Airbus Group for France, Germany and Spain. Airbus Defence and Space[162] (composed of four business lines – Military Aircraft, Space Systems, Communication and Intelligence & Security (CIS), and Electronics – Airbus Defence and Space) is Europe's number 1 defence and space company; worldwide, it ranks second for space and is among the top 10 defence companies, with revenues of approximately € 13 billion per year. EADS Talarion was expected to become fully operational in 2016. Its end goal was to perform intelligence, surveillance, target acquisition and reconnaissance (ISTAR) operations in land, sea and coastal missions. More specifically, its modular design permitted operations in different configurations, from real-time information gathering in the enemy's battlefield by performing surveillance and target acquisition over large areas, to flying at high altitudes for long durations. Nevertheless, due to the fact that there is scarcely any news published concerning the future of the project since 2012, the entire Talarion program can be officially written off as defunct.

BaToLUS Project – Battle Damage Tolerance for Lightweight Unmanned Aerial Vehicle (UAV) Structures[163]; the project has successfully developed a new rapid prototype modeling capabilities – 'the main objectives of the project have been: (i) defining a UAV design and development process for vulnerability reduction to be integrated in the design process, (ii) demonstrating an improvement of the current UAV modelling, simulation and design capabilities, and (iii) providing a guideline on the costs associated with the development of a vulnerability-improved UAV.'[164] The BaToLUS project was funded and managed by Germany, France, Sweden, and the United Kingdom under the EDA's

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[156] The SUNNY project . Accessed September 25, 2015. http://www.sunnyproject.eu/

[157] Perseus. Accessed September 25, 2015. http://www.perseus-fp7.eu/?page_id=17

[158] *Ibidem*

[159] Seabilla. Accessed September 25, 2015. http://www.seabilla.eu/cms/

[160] Seabilla – The Project. Accessed September 25, 2015. http://www.seabilla.eu/cms/TheProject

[161] Talarion MALE Unmanned Air Vehicle (UAV), France. Accessed September 25, 2015. http://www.airforce-technology.com/projects/talarionuav/

[162] Airbus Group. Accessed September 25, 2015. http://www.airbusgroup.com/int/en/group-vision/what-we-do.html

[163] The EDA Latest News, 'EDA project to reduce vulnerability of lightweight UAV structure,' (December 3, 2015). Accessed September 25, 2015. http://www.eda.europa.eu/info-hub/press-centre/latest-news/2015/12/03/eda-project-to-reduce-vulnerability-of-lightweight-uav-structures

[164] *Ibidem*

framework and carried out by Airbus Defence & Space Germany (project leader), Airbus Group Innovations France, BAE Systems, CEA Gramat, Dynamec Research AB, Fraunhofer-Institut für Kurzzeitdynamik – Ernst-Mach-Institut (EMI), Industrieanlagen-Betriebsgesellschaft mbH (IABG), ONERA – The French Aerospace Lab, and SAAB Aerosystems.

In November 2013, defence ministers from a club of seven[165] drone-using EU Member States (France, Germany, Italy, Greece, Poland, Spain, and The Netherlands) tasked the EDA to draft a study on joint production of Medium Altitude Long Endurance (MALE) vehicles. The MALE project is aimed to manufacture drones from 2020 onwards, which can be employed to strike military targets and for the surveillance of migrant boats in the Mediterranean Sea.

A select number of EU Member States have initiated cooperation frameworks[166] for the joint development of drones: France and the UK are developing a 'stealth' drone named Telemos to fly in 2018; France, Italy, Greece, Spain, Switzerland, and Sweden are working on a 'euro-Ucav' or unmanned combat air vehicle, the nEUROn.[167] An EDA meeting of eight countries in November 2013 (Belgium, Austria, the Czech Republic, Germany, France, Italy, plus the US and Israel) advanced the scheme, 'Joint Investment Programme on RPAS for Air Traffic Insertion'[168], to enable drones to fly alongside civilian planes.

The European Commission in collaboration with Israel Aerospace Industries and the Austrian Diamond Airborne Sensing has also been developing drones to be employed for civilian purposes and the surveillance of the EU civilian airspace.

Hybrid aerial surveillance drones[169] for maritime surveillance and for combating illegal migration have been considered by FRONTEX, the EU border agency, due to the fact that they circumvent the EU laws prohibiting unmanned drones from flying in civilian airspace.

The EU's Joint Research Centre (JRC)[170] with two of its seven research institutes, namely the Institute for the Protection and Security of the Citizen (IPSC) and the Institute for Environment and Sustainability (IES), has also taken an interest in drone-related research, especially in relation to border control and maritime surveillance technologies.

Between 4 September 2014 and 5 February 2015, an Italian MQ-1 Predator RPAS has been successfully deployed in support of Operation Atalanta led by the European Union Naval Force (EUNAVFOR).[171] Operating from Djibouti in support of the EU mission's mandate to fight piracy in the India Ocean off the coast of Somalia, this was the first time a medium altitude long endurance (MALE) RPAS was deployed so as to provide real-time video surveillance and early warning of possible attacks.

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[165] EUOBSERVER, 'Seven EU states create military drone 'club'' (November 19, 2013). Accessed September 25, 2015. http://euobserver.com/tickers/122159
[166] *Ibidem*
[167] nEUROn. Accessed September 25, 2015. http://www.airforce-technology.com/projects/neuron/
[168] The EDA – Defence Ministers commit to capability development programmes. Accessed September 25, 2015.
http://www.eda.europa.eu/info-hub/news/2013/11/19/defence-ministers-commit-to-capability-programmes
[169] N. Nielsen, 'EU looks to 'hybrid drones' for legal shortcut on migration,' EUOBSERVER (October 14, 2013).Accessed September 25, 2015. http://euobserver.com/priv-immigration/121735
[170] The EU's Joint Research Centre (JRC). Accessed September 25, 2015. https://ec.europa.eu/jrc/
[171] European Defence Matters, *A magazine of the European Defence Agency*, Issue 7 (2015):7.

2. Democratic Oversight and the European Parliament

All of the above-mentioned examples are revealing an EU-led hybrid drone development programmes, favouring big security and defence companies and a club of select and powerful EU Member States. Without any doubt, more democratic input should be instilled in the EU-led dual use drone development research programmes and their security priorities, especially when they are uncritically conflated under labels such as crisis management, counter-terrorism, homeland security, or border control.

Issues pertaining to democratic accountability and oversight come up in the discussion, especially when the European Parliament is not involved in the debate and EU institutions are under lobbying pressure by the European defence industry to put forward favourable policy initiatives.

Further reflection about irresponsible innovation and research as regards the development of hybrid unmanned aerial vehicles is long overdue at the EU and national levels − a proper debate should address checks and balances mechanism in this evolving policy realm and defence industry.

The 86-page Statewatch study, Eurodrones Inc[172] from February 2014 concludes that the EU 'has substituted the democratic process for a technocratic one', the watchdog warning that the potential of drones for social control in Europe needs more democratic and public scrutiny.

The contention is that the EU has to put forward targeted regulation for the use of drones in civilian airspace, especially when their previous use was for militarized and repressive purposes, with clear implications for privacy, civil liberties, and human rights. It appears that investment in drone research and technology has become an EU-level, politically-driven policy, without engendering basic democratic debate on the topic.

The lack of democratic accountability is shrouded in a typical technocratic process of so-called 'road maps' designed by EU officials, industry representatives and consultants, and without a substantive input offered by civil society, national parliaments or the European Parliament.

This could be construed as an instance of funding for military-grade R&D by stealth in the absence of clear-cut and exacting rules to differentiate 'dual use' research. Or in other words, the European Defence Agency and the European Commission are funding for defence through the 'back door' by using 'civilian-military synergies' and 'dual-use' technology like in the case of drones to provide the justification for what is clearly the militarization of the European R&D policy.

It goes without saying that economic justifications have been put forward by the European Commission and EDA in terms of emphasising the commercial payoffs of dual-use drone research and the EU's much needed competitiveness in the field of disruptive innovation.[173] This blurring of lines and the unproblematic conflation of civilian and military drones is indicative of 'a wholesale militarisation of the civilian domain.'[174]

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[172] Statewatch Report, 'Eurodrones Inc.'

[173] European Commission – Speech, 'Three pillars of disruptive innovation for Europe,' (November 17, 2014). Accessed September 25, 2015. http://europa.eu/rapid/press-release_SPEECH-14-1887_en.htm

[174] S. Mutter, 'The doublespeak of drones,' *openDemocracy* (March 17, 2015). Accessed September 25, 2015. https://www.opendemocracy.net/sam-mutter/doublespeak-of-drones

Disruptive innovation[175] was a concept coined by Harvard Business School professor Clayton M. Christensen in the mid-1990s to describe a process by which new technologies, products or services are introduced to create new market and value network that ultimately disrupt and displace the established leaders in the existing market and value network. Christensen's work focused on the dichotomy between *sustaining* and *disruptive* innovation: the former advocating the incremental improvement of performance in existing products along the lines of what mainstream customer value; while the latter creating new value via niche or simple selling points that often traditional customers may not initially want or recognize but later want.

Disruptive innovation should not be confused with the correlative concept of disruptive technology[176] – as Christensen recognized, it is in fact the *business model* of disruptive innovation that disruptive technologies enable that create the disruptive / game-changing / revolutionary impact. Disruptive technologies imply radical technical changes that offer capabilities that were not previously available on the market. Applied to the military domain,[177] disruptive technologies could radically change the existing balance of military power, have unprecedented military consequences and security challenges, and last but not the least trigger the need for new security and defence strategies.

Contemporary disruptive innovation technologies such as RPAS (civilian & military) have been heralded to revolutionize security-making at home and abroad – they are multipurpose, adaptable and cost-efficient, with civilian and military applicability for homeland security purposes, in crisis management operations, for reconnaissance, surveillance and data gathering, and other civilian-oriented applications such as disaster relief. The disruptive innovation model applied to drones[178] can provide useful insights into their implementation and their socio-political, economic, democratic, and ethical consequences.

Drones represent a complex convergence of cutting-edge technology and expertise, and their applicability highly depends on the ways in which unmanned programs are implemented as a key resource with other manned systems, for example as straight-on competitors to manned platforms or as a complementary resource.

Consequently, it is advisable to analyse such technologies by taking into account the broader socio-political context. The 'rapid technological progress and the comparatively slow legislative process and regulatory rulemaking'[179] are another aspect to keep in mind when talking about the lack of democratic oversight. To uncritically insert drones into an existing security framework could also have unforeseen or even negative consequences, more so than not using them at all. This could be applicable to using drones for policing or border control

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[175] Clayton M. Christensen, Disruptive innovation, Key concepts. Accessed September 25, 2015. http://www.claytonchristensen.com/key-concepts/ For more see C. M. Christensen, *The Innovator's Dilemma* (Cambridge, MA: Harvard Business School Press, 1997).

[176] Disruptive innovation. Accessed September 25, 2015.
 http://innovationzen.com/blog/2006/10/04/disruptive-innovation/

[177] N. Robinson *et al.*, *Security Challenges to the Use and Deployment of Disruptive technologies*, Technical report prepared for the European Commission, RAND Europe (Santa Monica, Californian, 2007). Accessed September 25, 2015. http://www.rand.org/content/dam/rand/pubs/technical_reports/2007/RAND_TR406.pdf

[178] A. Muqawama, *Drones and Disruptive Innovation*, Center for a New American Security (11 July 2012). Accessed September 25, 2015.
http://www.cnas.org/blog/guest-post-drones-and-disruptive-innovation-5949#.VnlK1beFPcs

[179] A. Howard, 'Disruptive technologies pose difficult ethical questions for society,' TechRepublic (22 April 2014). Accessed September 25, 2015.
http://www.techrepublic.com/article/disruptive-technologies-pose-difficult-ethical-questions-for-society/

activities, and the bellow discussion on the EU's border management agency FRONTEX is most revealing in this respect.

3. FRONTEX and the Dronization of Border Management

Smart borders[180] or technological borders[181] have become essential components in the EU's plan for irregular immigration control, with FRONTEX as the EU's border agency to utilize drones as key tools in its border management activities. Integrated border management[182] is actually prioritized, by strengthening the functional aspects of FRONTEX – The European Agency for the Management of External Borders[183] in terms of improved usage of information, border surveillance and new technologies through the European Border Surveillance System (EUROSUR).[184] The FP7 programme was heavily utilized to fund the development and demonstration of new technologies for the EUROSUR system.

FRONTEX has already started looking into the viability of Remotely Piloted Aircraft Systems (RPAS) for providing enhanced surveillance coverage of expansive maritime and sea frontiers.[185] In this respect, the agency has organized practical demonstrations and equipment tests as regards the deployment of RPAS for European border surveillance, going as far as paying for demonstrations of Israeli drones described as the 'ultimate solution for Over The Hill reconnaissance missions, Low Intensity Conflicts and Urban warfare operations.'[186]

For the moment, the choice is to be made between Remote Piloted Aircraft Systems (RPAS) and Optionally Piloted Aircraft (OPA) potential for European border surveillance and search and rescue (SAR) operations[187] – the latter could be operated by remote control but could also avoid flight restrictions placed on drones in commercial airspace through the presence of a person on board. 'If you are going to invest in this kind of equipment, you need to use it for the next 10 to 15 years,' [188] FRONTEX head of research Edgar Beugels stated about drones. For instance, the Austrian-based firm, Diamond Airborne Sensing, manufactures the Diamond Airborne Sensing DA-42, a twin-engine craft also known as the Guardian, which can be used both as a drone and as an OPA and it has flight autonomy of 12.5 hours.[189]

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[180] European Commission – Press Release, 'EU 'Smart Broders': Commission wants easier access and enhanced security,' (Brussels, October 25, 2011). Accessed September 25, 2015.
http://europa.eu/rapid/press-release_IP-11-1234_en.htm

[181] H. Dijstelbloem and A. Meijer, *Migration and the New Technological Borders of Europe* (Basingstoke: Palgrave Macmillan, 2011).

[182] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 17 June 2008 – A Common Immigration Policy for Europe: Principles, actions and tools. Accessed September 25, 2015.
http://europa.eu/legislation_summaries/justice_freedom_security/free_movement_of_persons_asylum_immigration/jl0001_en.htm

[183] FRONTEX. Accessed September 25, 2015. http://frontex.europa.eu/

[184] EUROSUR. Accessed September 25, 2015. http://frontex.europa.eu/intelligence/eurosur/

[185] FRONTEX – Border Surveillance. Accessed September 25, 2015.
http://frontex.europa.eu/research/border-surveillance/

[186] 'Frontex eyes drones to further war on immigration' (March 26, 2012). Accessed September 25, 2015.
http://www.stopwapenhandel.org/node/1286

[187] FRONTEX – RPAS Border Surveillance Workshop, 2012. Accessed September 25, 2015.
http://frontex.europa.eu/news/rpas-border-surveillance-workshop-2012-invitation-u4Ibe1

[188] Nielsen, 'EU looks to 'hybrid drones', 2015.

[189] *Ibidem*

RPAS would be incorporated, along with other radars, off-shore sensors, satellite tracking systems and imagery, into the broader surveillance arsenal for border management and thus becoming a key element of EUROSUR. The BSUAV project – Border Surveillance by Unmanned Aerial Vehicles (UAVs)[190] is a clear example in this respect: its aim was to understand the problems posed by various types of borders and to delineate realistic UAV-based systems to tackle such specific problems. Are the above mentioned initiatives an instance of a broader process of militarisation of border controls and subsequently, is technology *per se* a back door for pushing forward such a process?

Critical voices have already been raised concerning the isolation of the human factor from the border management cycle and the transformation of the European Union into a high-tech 'Fortress Europe', especially in terms of investing EU money in policing hardware such as hybrid aerial surveillance drones. However drone-enthusiastic the European armament industry may be for lucrative projects, technology is not necessarily the best response to combating irregular migration generated by deeper societal and economic problems.

FRONTEX has been regularly taking part in forums dedicated to the securitization of border controls in the EU, alongside major industry lobbying groups such as the Aerospace and Defence (ASD) association[191], which promote their on corporate interests and the aeronautics industry as a strategic priority for the EU. Moreover, FRONTEX is now allowed the option to directly acquire equipment[192], making the agency an important new player customer the drone-producing arms industry.

The EU's Institute for the Protection and Security of the Citizen of the Joint Research Centre (IPSC)[193] also takes part in the key EU-funded R&D projects involving border control drones and it has also played an important role in the BORTEC[194] feasibility study for EUROSUR.

On the contrary, FRONTEX has emphasized the humanitarian factor in the use of drones for border surveillance and the fact that drones could prove to become effective tools for search and rescue (SAR) operations at sea and consequently save more human lives.

The agency's executive director, Ilkka Laitinen, emphasized that FRONTEX is looking to expand its surveillance operations beyond the EU to develop a so-called 'common pre-frontier intelligence picture (CPIP).'[195] Unmanned aerial vehicles (UAVs) are much more cost-effective to deploy at sea for maritime surveillance so as to locate, for example, migrants or refugees in distress. The idea is that RPAS are much more cost-effective and cheaper than manned aircrafts and consequently they have the prospective to expand the aerial surveillance of wide maritime and land areas.

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[190] BS-UAV (Study on Border Surveillance by UAV), EUROSENSE. Accessed September 25, 2015. http://www.eurosense.com/documents/catalog/1492.xml?template=/system/templates/site/print.html

[191] A. Fotiadis, 'EUROPE: Drones may Track Migrants,' *Global Issues* (November 1, 2010) Accessed September 25, 2015. http://www.globalissues.org/news/2010/11/01/7506

[192] Council of the European Union, 'Proposal for a Regulation of the European Parliament and the Council amending Council Regulation (EC) No 2007/2004 establishing a European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union (FRONTEX) – Analysis of the final compromise text with the view to agreement' (Brussels, July 4, 2011). Accessed September 25, 2015. http://www.statewatch.org/news/2011/jul/eu-council-frontex-final-12341-11.pdf

[193] Joint Research Centre – The Commission's in-house science service. Accessed September 25, 2015. https://ec.europa.eu/jrc/en/institutes/ipsc

[194] European Commission / Joint Research Centre Ispra, 'Integrated Maritime Policy for the EU, Working Document III on Maritime Surveillance Systems,' (June 14, 2008): 20. Accessed September 25, 2015. http://ec.europa.eu/maritimeaffairs/documentation/studies/documents/maritime-surveillance_en.pdf

[195] N. Nielsen, 'Frontex chieg looks beyond EU borders,' Euobserver (January 14, 2013). Accessed September 25, 2015. https://euobserver.com/fortress-eu/118471

It is expected that RPAS will become one of the many technologies employed by FRONTEX as a European wide border monitoring instrument. If and when it ensues, FP7 funding will have played a substantial role in making it possible, as demonstrated by the Table below documenting the EU R&D funding initiatives for UAV-related projects under the FP7 programme:

Table IV The EU's FP7 R&D Funding for UAV-related Projects[196]

Date	PROJECTS	AIMS	FUNDING	CONSORTIUMS
2004	**STABORSEC**[197] – Standards For Border Security Enhancement	To develop 'an inventory of needed standards for stand-alone equipment used for border security, amongst which was the transfer of NATO standards for unmanned military platforms to the civil domain.'	Preparatory Action for Security Research (PASR) (2004-2006)	Sagem Défence Sécurité (France)
2006	**BSUAV** – Border Surveillance by Unmanned Aerial Vehicles (UAVs)	To present a 'complete analysis of the potential contribution of the UAVs to peacetime security on European borders, both green and blue.'	The European Commission's Preparatory Action for Security Research (PASR) (2004-2006) EU contribution (€): 433,000	Dessault Aviation (France), Alenia Aeronautica, Rolls-Royce, SAAB, Thales, Flying Robots
	SOBCAH – Surveillance of Borders, Coastlines and Harbours Renamed 'Safer European borders' by the Commission	To identify the main threats relevant to 'green' and 'blue' borders and developing the most suitable architectural solutions. To 'tackle the European border surveillance problem' and the '6,000 km of land borders and 85,000 km of coastlines, with possibilities for access for illegal migrants, drug smugglers and terrorists.'[198]	The European Commission's Preparatory Action for Security Research (PASR) (2004-2006) EU contribution (€): 2,000,000	Finmeccanica's Galileo Avionica (Italy), Selex, Thales, TNO, Rheinmetal, Indra

[196] Adapted from various projects' websites and Statewatch Report, 'Eurodrones Inc.', 38.

[197] STABORSEC – Standards For Border Security Enhancement, Preparatory Action for Security Research PASR 2006. Accessed September 25, 2015. http://www.piap.pl/en/Scientific-activities/International-Research-Project/Projects-completed/STABORSEC

[198] H. Athwal, 'The Emergence of a European Security-Industrial Complex,' (May 11, 2006). Accessed September 25, 2015. http://www.irr.org.uk/news/the-emergence-of-a-european-security-industrial-complex/

2007	μDRONES[199] – micro Drone autonomous Navigation and Environment Sensing	To develop a micro drone system that provides: a mission planning system; autonomous localization and navigation; automatic mission execution; autonomous obstacle avoidance.	EU contribution (€): 1,900,000	Thales, AirRobot
2008	GLOBE[200] – European Global Border Environment	Roadmap on border control technology to achieve 'the gradual convergence of […] checks on people, checks on goods, surveillance and police investigation'. It 'will provide a comprehensive framework in which an integrated global border management system must be developed.'	EU 7th Framework Programme funds in Security priority FP7-SEC-2007-1 EU contribution (€): 1,000,000	Telvent Interactiva, S.A. (Spain) (coordinator), Skysoft, Altran, GMV Aerospace & Defence, Eurosense, Amper Sistemas, Cogent Systems
	OPERAMAR – Interoperable approach to the European Union maritime security management	Roadmap 'with the objective of providing a knowledge base about the status of Pan-European maritime security, prescribed by the European Commission´s Maritime Policy.'[201]	EU 7th Framework Programme funds in Security priority, FP7-218045 (1st round of security research funding) EU contribution (€): 670,000	Thales Underwater Systems SAS (France) (coordinator), Indra Sistemas S.A., Selex, Quintex, Edisoft
	TALOS – Transportable autonomous patrol for land border surveillance	The main objective of TALOS project is to develop and field test the innovative concept of a mobile, autonomous system for protecting European land borders. The complete system applies both aerial and ground unmanned vehicles, supervised by command and control centre.[202] The project used drones provided by Israel	EU 7th Framework Programme funds in Security priority (co-funded) €20 million, €13 million of which has been granted by the EC (1st round of security research funding) EU contribution(€):12,900,000	14 institutions from 8 EU member states (Belgium, Estonia, Finland, France, Greece, Poland, Romania, Spain) as well as 1 EU candidate (Turkey) and 1 associated country (Israel). PIAP, Defendec, Israel Aerospace

[199] μDRONES – micro Drone autonomous Navigation and Environment Sensing. Accessed September 25, 2015. http://www.ist-microdrones.org/home/liblocal/docs/Flyer.pdf

[200] GLOBE – European Global Border Environment. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/88217_en.html

[201] OPERAMAR – An Interoperable Approach to the European Union. Accessed September 25, 2015. http://www.indracompany.com/en/sostenibilidad-e-innovacion/proyectos-innovacion/operamar-an-interoperable-approach-to-european-unio

[202] EU Border Protection System – TALOS – Transportable Autonomous patrol for Land bOrder Surveillance system. Accessed September 25, 2015. http://www.talos-border.eu/index.php?option=com_content&view=article&id=52&Itemid=60

		Aerospace Industries.		Industries
	WIMA²S – Wide Maritime Area Airborne Surveillance	WIMA²S addressed the Airborne building block of maritime surveillance with the potential for reduced cost of operation, more autonomous and improved efficiency through the introduction of air vehicles with reduced or zero on-board crew. The project uses Aerovision's Fulmar drone, a mini-UAV.	EU 7th Framework Programme funds in Security priority (1st round of security research funding)	Thales (France) coordinator Eurosense, TNO, Aerovision, Selex, Dessault, Fraunhofer
2009	**ARGUS 3D**[203] - AiR Guidance and Surveillance 3D Homeland Security & Combating terrorist threats	The development of a low cost radar based system, integrated in a conventional Air Traffic Control System (ATC), capable of supporting the Air Traffic Control Operator (ATCO) by providing additional information on the nature of targets and their threat levels.	EU contribution (€): 1,900,000	Fraunhofer, Selex
2010	**I2C**[204] – Integrated System for Interoperable sensors and Information sources for Common abnormal vessel behaviour detection and Collaborative identification of threat	Proposes for 2015 a new generation of innovative sea border surveillance system implementing key existing and in development capacities to track all vessel movements to early identify and report on threats associated to detected suspicious events.	EU contribution (€): 9,870,000	DCNS, Deutchse-Zepelin, Airshipvision
	SEABILLA – Sea Border Surveillance **EUROSUR**-related	Aims to 'define the architecture for cost-effective European Sea Border Surveillance systems, integrating space, land, sea and air assets, including legacy systems; apply advanced technological solutions to increase performances of surveillance functions;	EU 7th Framework Programme funds in Security priority (2nd round of security research funding) EU contribution (€): 9,842,000	Selex-Finmeccanica (Italy) (coordinator), Thales, Sagem/SAFRAN, TNO, Telespazio, Cassidian, Indra, Alenia, Eurocopter,

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[203] Final Report Summary – ARGUS 3D (AiR Guidance and Surveillance 3D). Accessed September 25, 2015. http://cordis.europa.eu/result/rcn/141409_en.html

[204] I2C – Integrated System for Interoperable sensors & Information sources for Common abnormal vessel behaviour detection & Collaborative identification of threat. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/96259_en.html

				Edisoft
	develop and demonstrate significant improvements in detection, tracking, identification and automated behaviour analysis of all vessels, including hard to detect vessels, in open waters as well as close to coast.'[205]			
	OPARUS – Open Architecture for UAV-based Surveillance System[206] **EUROSUR-**related	The goal of this project is to elaborate an open architecture for the operation of unmanned air-to-ground wide area land and sea border surveillance platforms in Europe. This architecture is based on analysis of concepts and scenarios for UAV-based aerial surveillance of European borders. It takes into account the emerging legislation for insertion of UAS into controlled civil airspace.[207]	EU 7th Framework Programme funds in Security priority (2nd round of security research funding) EU contribution (€): 1,188,000	Sagem (France) (coordinator), EADS, BAE Systems, Dessault Aviation, Cassidian, Israel Aerospace Industries, Isdefe, Onéra, Finemeccanica-Selex, Thales
2011	**PERSEUS** – The Protection of European seas and borders through the intelligent use of surveillance **EUROSUR**-related	PERSEUS represents the first demonstration project implemented by the FP7 Security Research Theme. Its purpose is to build and demonstrate an EU maritime surveillance system integrating existing national and communitarian installations and enhancing them with innovative technologies.[208]	EU 7th Framework Programme funds in Security priority (2nd round of security research funding) € 43.7 million EU contribution(€):27,848,000	Indra (Spain) (coordinator), EADS, Dessault, Isdefe, DCNS, Cassidian, Saab, Boeing
2012	**AVERT**[209] – Autonomous Vehicle Emergency Recovery Tool	To provide a unique capability to Police and Armed Services to rapidly deploy, extract and remove both blocking and suspect vehicles from vulnerable positions such as enclosed infrastructure spaces,	EU contribution (€): 2,811,000	IDUS, Force Ware, Marshall

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[205] SEABILLA – Sea Border Surveillance. Accessed September 25, 2015. http://www.seabilla.eu/cms/
[206] OPARUS – Open Architecture for UAV-based Surveillance System. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/95504_en.html
[207] *Ibidem*
[208] PERSEUS – The Protection of European seas and borders through the intelligent use of surveillance. Accessed September 25, 2015. http://www.perseus-fp7.eu/?page_id=17
[209] AVERT – Autonomous Vehicle Emergency Recovery Tool. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/102070_en.html

	tunnels, low bridges as well as under-building and underground car parks.		
DARIUS[210] – Deployable SaR Integrated Chain with Unmanned Systems	Will leverage previous R&D efforts on technologies and the possible added-value of these systems for situation awareness to envisage their adaptation and integration in complex multi-national/agency SAR operations. The main objective of DARIUS is to reach effective levels of interoperability so these systems can be shared between several organisations.	EU contribution (€): 7,476,000	BAE Systems, Cassidian, Skytek
ICARUS[211] – Integrated Components for Assisted Rescue and Unmanned Search operations	The goal of ICARUS is to decrease the total cost (both in human lives and in €) of a major crisis. In order to realise this goal, the ICARUS project proposes to equip first responders with a comprehensive and integrated set of unmanned search and rescue tools, to increase the situational awareness of human crisis managers and to assist search and rescue teams for dealing with the difficult and dangerous, but life-saving task of finding human survivors.	EU contribution(€):12,585,000	Fraunhofer, Atos, NATO
HELI4RESCUE[212] – Heavy Payload Helicopter for Last Mile Rescue	The possibility for Civil Security operators to use large air transport systems for deploying heavy loads on crisis sites (last mile). It investigates in particular the deployment in civil missions of systems which are now targeted only for military use.	EU contribution (€): 1,048,000	Fraunhofer, Eurocopter

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[210] DARIUS – Deployable SaR Integrated Chain with Unmanned Systems. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/102362_en.html

[211] ICARUS – Integrated Components for Assisted Rescue and Unmanned Search operations. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/102326_en.html

[212] HELI4RESCU – Heavy Payload Helicopter for Last Mile Rescue. Accessed September 25, 2015. http://cordis.europa.eu/result/rcn/152066_it.html

Year	Project	Description	Funding	Participants
2013	**CLOSEYE** – Collaborative evaluation of border surveillance technologies in maritime environment by pre-operational validation of innovative solutions	The aim of providing the EU with an operational and technical framework that would increase situational awareness and improve the reaction capability of authorities surveying the external borders of the EU. This initiative also comes in response to an urgent sudden major challenge for the control of the migratory pressure from the North African coast and to a limited market providing innovative solutions for the accomplishment of major operational objectives.[213]	EU 7th Framework Programme funds in Security priority (3rd and final round of security research funding) EU contribution (€): 9,218,000	Spanish Interior Ministry (coordinator), Isdefe, the EU Satellite Centre, the Italian Space Agency…
	AEROCEPTOR[214] – UAV Based Innovative Means for Land and Sea Non-Cooperative Vehicles Stop	The project aims precisely to increase the capability of law enforcement authorities to remotely, safely and externally, control and stop non-cooperative vehicles in both land and sea scenarios, by means of Unmanned Aerial Vehicles.	EU contribution (€): 3,469,000	PIAP, ISDEFE, Rotem, Israel Aerospace Industries
2014	**SUNNY** – Smart UNattended airborne sensor EUROSUR-related	To use sensors of different kinds of drones to collect real-time information in operational scenarios. A two-tier intelligent heterogeneous UAV sensor network will be considered in order to provide both large field and focused surveillance capabilities, where the first-tier sensors, carried by medium altitude, long-endurance autonomous UAVs, are used to patrol large border areas to detect suspicious targets and provide global situation awareness.[215]	EU 7th Framework Programme funds in Security priority (2nd round of security research funding) EU contribution (€): 9,570,000	BMT GROUP LIMITED (UK) (coordinator), SAAB

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[213] CLOSEYE – Collaborative evaluation of border surveillance technologies in maritime environment by pre-operational validation of innovative solutions. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/108227_en.html

[214] AEROCEPTOR – UAV Based Innovative Means for Land and Sea Non-Cooperative Vehicles Stop. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/106475_en.html

[215] SUNNY – Smart UNattended airborne sensor. Accessed September 25, 2015. http://cordis.europa.eu/project/rcn/111498_en.html

The question still remains whether drones are the best solution for tracking migrants and assuring the security of the EU's blue borders. A German member of the European Parliament and migration spokesperson for the Green alliance of EU politicians, Ska Keller, poignantly observed that 'Drones are very expensive and they don't help. Even if a drone detects a vessel, it can't do anything for them. You need to have actual people there, and having a drone doesn't guarantee that.'[216]

Moreover, the tendency to overemphasize technology and combat-surveillance-security drones to tackle both internal and external security problems by thinly accountable bureaucrats and corporatists point towards a European 'policy designed by the drone industry, for the drone industry.'[217] Not to mention the potential negative consequences for the EU in engaging in balancing behaviour with other international drone-producing actors, leading to a global arms race in producing and combating drone technology.

All in all, it is difficult to assess the implications of disruptive defence technologies such as RPAS in the European security landscape, especially because they can both solve security challenges but also pose further problems.[218] Policy makers and the industry alike need to carefully evaluate the military potential of disruptive or emerging technologies and strike a healthy balance between their military and civilian use.

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[216] B. Neild, 'EU plans controversial drones to track migrants,' Global Post (July 20, 2012). Accessed September 25, 2015. http://www.globalpost.com/dispatch/news/regions/europe/120719/eu-drones-migrants
[217] Statewatch Report, 'Eurodrones Inc.', 76.
[218] J. Hasik, 'Gauging the Implications of Disruptive Technologies in European Security Challenges,' Atlantic Council (October 17, 2013). Accessed September 25, 2015. http://www.atlanticcouncil.org/en/blogs/defense-industrialist/gauging-the-implications-of-disruptive-technologies-in-european-security-challenges

Conclusion

The European Union, as a *suis generis* actor in international relations, has prompted across academia different responses to the ontological and epistemological challenges of capturing the fleeting nature of its unique and complex institutional identity. From this perspective, it would be misleading to apply classical state-centred templates of analysis to a multi-faceted entity such as the EU. The EU is neither an intergovernmental organization nor a supranational or federal state. Rather than conceptualizing the EU in the traditional language of a Westphalian, state-centred theoretical key, one should take into consideration and recognize the EU's multi-dimensional nature and its constant institutional development.

In light of the above discussion, the EU has often been labelled in the academic literature as a 'soft', 'civilian' international power, lacking the military credentials required to earn the title of superpower,[219] as the United States' international stance is usually termed. Existing academic literature in International Relations and European Studies has often used the concept of 'civilian power' to prescribe the EU's external perception and roles: a civilian power being an entity that does not use military, hard power to assert its presence in the international system, but a complexity of normative, economic, financial, diplomatic, and political means.

The very unique nature of the EU determines an array of further debates regarding the EU's external and security roles and the EU's presence as a post-sovereign and post-modern polity, thus creating novel ways of engaging the international system. Taking into account the *sui generis* nature of the EU and its particular external action, the EU is facing an identity dilemma between preserving its civilian vocation and pursuing an ambitious military transformation.

Considering that economic global governance alone and the promotion of normative soft-power-type of discourses cannot guarantee a world order without the backing of a strong arm, the EU as a civilian power, as a former Kantian *foedus pacificum*,[220] should also pursue Hobbesian militarizing instruments to respond to international threats.

Defence policy is one of the last redoubts of sovereignty that the EU Member States have to surpass, especially in the face of the disturbing tendency of corporate-lobbied militarization at the EU level. By taking into consideration the facts and observations presented in this paper, it could be indeed said that the defence expectations of the EU Member States are being constantly moulded by the EDA and the European Commission. Such increased expectations will lock the EU in an evolutionary path that will lead to the creation of a European 'common' defence. It comes as no surprise then that drones are now the technology *du jour* in Europe and that there is an EU-led new agenda to promote hybrid RPAS research and development.

Drones have become the iconic weapon of the 21st century, introducing radical changes in high-tech warfare and the business of surveillance and killing. By facing stiff competition from international arms manufactures such as the US and Israel, the paper showed that the EU has also got on the drone development bandwagon (albeit as a latecomer), hoping that investment schemes in the industry will revitalize Europe's military-industrial complex.

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[219] J. McCormick, *The European Superpower* (Palgrave Macmillan, 2007): 68.
[220] A. Hyde-Price, ''Normative' Power Europe: a realist critique,' *Journal of European Public Policy* 19/2 (March 2006): 235.

The present study demonstrated that the EU's interest in drones is double-folded: on the one hand, drones could be used as cheap and effective means to ensure internal security through border management, surveillance, and counter-terrorism; and on the other hand as a military tool to support the EU's Common Security and Defence missions and operations in theatres of action abroad. It also reflects the above-mentioned militarisation trend tacitly encouraged by the EU, with the more contentious aftereffect of automation in both warfare and border control and management (FRONTEX) targeting homeland security.

Technology diversification with dual-use research is being put forwards as the solution to more complex security challenges, broader cultural and economic arguments being used by proponents of hybrid drone development to justify and legitimise expensive and controversial defence programs. As we enter the era of *homo sapiens technologicus*,[221] the undeveloped relationship between security, technology, law, culture, and human action is called into question, especially when considering the potential advantages and drawbacks of weapons technologies and their use in the civilian realm and airspace.

The CSDP operations have become expeditionary, multinational and multi-instrument, directed at achieving security and stability in conflict areas. Information is critical, whether appraising the 'war of ideas' in cyberspace, facilitating effective command decisions, or using the right capabilities in what has now been called as 'hybrid warfare'. The EDA has a privileged position at the hub of national defence industries and private defence firms agendas to accomplish the above objectives and to generate possible synergies to surpass the current defence challenges at a European level.

This singular positioning has permitted the EDA to extend particularly cogent know-how and analytical input and streamline development across a range of issue areas. Its special location has allowed the Agency to develop persuasive analyses and proposals across the range of its activities and it has enabled the EDA to become an interface[222] between three camps, the political, the economic, and the military. The EDA has become responsible with both the rationalization of Member States' defence budgets and the streamlining of the emerging European defence industry and market.

However, national states in the EU will want to make sure that the Europeanization of defence industries under the EDA's guidance will not jeopardize their national sovereignty and security. Not to mention the fact that Member States have different perceptions of defence needs and threats, diverse opinions about international security projection, and finally different interests as regards procurement and production of defence equipment. The export of defence equipment such civil-military drones can be also termed as an emotional topic[223] for certain EU countries. It not only involves issues of national defence interests and a convoluted process of political, economic and military decision-making and interests, but also issues pertaining to the field of morality and human rights, as well as cuts from other sectors in society for subsidizing the arms export.

Additionally, the national defence industrial sector has to have the consent of the government, lest it prevents the export of critical technologies[224] without the express permission of the state. This not only comes at a stark contrast to non-defence industries and markets but is also indicative of the potential political barriers the defence sector might face in the future when critical technologies are concerned.

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[221] M. Puech – *Homo Sapiens Technologicus. Philosophie de la technologies contemporaine, philosophie de la sagesse contemporaine* (Editions le Pommier, 2008).
[222] J. Howorth, 'The Instruments of Intervention: Military and Civilian Capabilities,' *Security and Defence Policy in the European Union* (Palgrave Macmillan, 2007).
[223] Martin, 'Do military export stimulate civil export?,' 599.
[224] Jones, *The Rise of European Security Cooperation*, 140.

As Benjamin Barber pointed out, 'after a long history of regional success, the nation-state is failing us on the global scale. It was the perfect political recipe for the liberty and independence of autonomous peoples and nations. It is utterly unsuited to interdependence.'[225] The Westphalia model of national state sovereignty seems increasingly inadequate to deal with globally engendered security and defence challenges – and the EU with the European Defence Agency could put forward a compelling new vision of security governance, if not, for the sole reason of practical feasibility and pragmatism.

As it was well observed by S. Stavridis in his working paper, *Why the 'Militarizing' of the European Union is strengthening the concept of a Civilian power Europe*, the concept of civilian power has recently come under scrutiny and become more or less obsolete, due to the EU's recent developments in the field of the Common Security and Defence Policy (CSDP) and in terms of a blatant militarizing orientation with the European Defence Agency (EDA).

Such militarizing moves push the EU towards most-possibly achieving the *finalité politique* of what Galtung envisaged about the EU, *i.e.* 'a superpower in the making'. It could be stated that the EU's normative, civilian-based foreign policy aspirations and legitimacy were conditioned on rethinking its 'powerless power' status in military and security terms. The issue to be considered is that normative influence in the international system has been often enough insufficient. To be credible and effective in international politics you also need to be backed by raw military power and security and defence capabilities.

The question to be asked is whether there is a true contradiction between the EU's civilian power status and its militaristic-oriented new identity. Will the new militarizing trends undermine the core values of what it has been termed as a postmodern civilian power or a successful civilian alternative to the hard power type of hegemonic international dominance? The foundation of the EU's special civilian mission, international political responsibility or historical memory of past tragedies, are all underlying the EU's normative discourse and self-perception as a democratic, human rights, and value-and-norms promoter. This is contrasted to the international *status-quo*'s orientation towards a new hard power security discourse that forces the EU to accommodate and change its international agenda in militaristic terms.

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[225] B. R. Barber, *If Mayors Rule the World: Dysfunctional Nations, Rising Cities* (Yale University Press, 2013).

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