A 'GAME CHANGER'? THE EU'S PREPARATORY ACTION ON DEFENCE RESEARCH

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ABSTRACT

The Preparatory Action for Common Security and Defence Policy-related research is currently under preparation, and it will serve as a test-bed to prove the relevance of defence-related research at the European Union-level. The Preparatory Action could potentially see between €75 - €100 million invested in defence-specific research over a three-year period beginning in 2017. The Preparatory Action follows on from a pilot project on CSDP research that was launched by the European Parliament with a budget line of €1.5 million over the 2015-2016 period. The Preparatory Action aims to serve as a basis for an eventual, fully-fledged, European Defence Research Programme. Indeed, should the work of the Preparatory Action prove successful, the next step would be to insert a specific thematic area on defence research within the next multi-annual financial framework (2021-2027) potentially worth some €3.5 billion.

The idea to specifically invest EU funds in defence research is potentially a 'game-changer'. Traditionally, the EU has suffered from important constraints when using EU funds for defence-related activities. Presently, projects and programmes funded under the European Structural and Investment Funds, COSME (Europe's programme for SMEs) and Horizon 2020 are still largely geared towards civilian rather than military projects, even though defence-related projects are not formally excluded. One of the chief objectives of the Preparatory Action and of any eventual European Defence Research Programme is to enhance Europe's strategic autonomy by investing in key defence technologies.

Yet using EU funds for defence-relevant research is not without its challenges. This policy paper analyses the likely relationships or approaches that may emerge from an EU-funded programme on defence research, and it draws out some of the challenges that could emerge during the rolling out phase of the Preparatory Action. On the basis of this analysis, this policy paper concludes that while the Preparatory Action will be a small-scale financial contribution to Europe's defence research efforts, it could – if correctly calibrated – lead to a step-change in the way the EU funds fundamental research to support the needs of Europe's armed forces. Notwithstanding this point, this policy paper recommends that the Preparatory Action should:

- Resist any duplication of national defence R&T and R&D efforts.
- Map and coordinate national- and European-level defence R&T and R&D efforts.
- Not be capability-driven but rather make prospective, longer-term, investments.
- Help avoid any further reductions in national defence R&T and R&D.
- Stay focused on defence R&T and R&D but converge with the civilian innovation base.
- Ensure fair and effective distribution of IPRs between the defence and civilian bases.

***Keywords**: European Union, Preparatory Action, Defence Innovation, Defence R&D, Defence R&T*

INTRODUCTION

The Preparatory Action for Common Security and Defence Policy (CSDP)-related research is currently under preparation, and it will serve as a test-bed to prove the relevance of defence-related research at the European Union (EU) level. The Preparatory Action could potentially see between €75 - €100 million invested in defence-specific research over a three-year period beginning in 2017. The Preparatory Action follows on from a pilot project on CSDP research that was launched by the European Parliament with a budget line of €1.5 million over the 2015-2016 period. The aim is for the Preparatory Action to serve as a basis for an eventual, fully-fledged, European Defence Research Programme (EDRP). Indeed, should the work of the Preparatory Action prove successful, the next step would be to insert a specific thematic area on defence research within the next multi-annual financial framework (2021-2027) potentially worth some €3.5 billion (EUISS, 2016: 27).

The idea to specifically invest EU funds in defence research is potentially a 'game-changer'. Traditionally, the EU has suffered from important constraints when using funds derived from the EU budget on defence-related activities. Presently, projects and programmes funded under the European Structural and Investment Funds (ESIF), COSME (Europe's programme for SMEs) and Horizon 2020 are still largely geared towards civilian rather than military projects, even though defence-related projects are not formally excluded. One of the chief objectives of the Preparatory Action and of any eventual EDRP is to enhance Europe's strategic autonomy by (co)investing in key defence technologies. Yet using EU funds for defence-relevant research is not without its challenges. As the recent 'Group of Personalities' (GoP) report states, among the key challenges facing the Preparatory Action will be correctly modulating issues such as Intellectual Property Rights (IPRs) (EUISS, 2016: 72).

This policy paper does not look specifically at the conclusions of the GoP report and nor does it outline potential technology areas that the Preparatory Action could invest in. Rather, it looks at the potential development of the Preparatory Action as it relates to EU-level governance of defence research. The paper therefore looks at the likely relationships or approaches that may emerge and it draws out some of the challenges that could emerge when rolling out of the Preparatory Action. Accordingly, this policy paper is structured in relation to four major questions: 1) is the Preparatory Action ambitious enough when compared to Europe's historical trends in defence R&T and R&D and the changing nature of defence innovation?; 2) how should Europeans think about defence innovation under the Preparatory Action?; 3) how will national defence research efforts relate to the Preparatory Action?; and 4) what are the likely political and strategic consequences of a move towards a Europeanisation of defence research?

THE PREPARATORY ACTION: TOO LITTLE, TOO LATE?

Defence innovation is critical if European states are going to be in a position to maintain a minimum level of strategic autonomy. Without consistent, long-term, investment in

defence technologies questions about Europe's reliability as a transatlantic partner may also arise. In a world where new centres of gravity are emerging in science and technology, Europe needs to understand that its contribution to global peace and security and to the transatlantic relationship cannot be simply counted in the missions they are part of. Neither is a commitment to spending a certain amount on defence as a share of GDP enough (Mölling, 2014).

Europeans need to wake up to the fact that defence innovation is as important an element of defence as the ability to field capabilities. Creating and nurturing new defence technologies is a military capability in its own right (Louth and Bronk, 2015). Investing in defence innovation is critical from an economic perspective but from a defence perspective it is vital if European states are to play a meaningful role in multinational coalitions, the CSDP and/or NATO and to support the European Defence Technological and Industrial Base (EDTIB). Yet one cannot use a hammer to solve every problem. Technology is not a panacea for the security problems facing Europe today, but defence innovation is an integral – though not exclusive – part of Europe's overall economic prosperity. In many respects, defence innovation 'gives an important and sometimes pivotal impulse to industry at large and contributes to economic growth' (Mauro and Thoma, 2016: 31).

European governments are struggling to invest in defence R&T and R&D. Notwithstanding various methodological approaches to calculating R&D expenditure, Eurostat (2016) calculate that as a share of their total expenditure on R&D the governments of the EU28 invested 11.3% on defence R&D in 2007 but by 2014 this share had fallen to 4.9%. While it is true that the share of civilian R&D has increased over this same period for the EU28 (from 88.7% in 2007 to 95.1% in 2014), it is unclear how much of this civilian R&D feeds into defence-relevant or dual-use research programmes (Eurostat, 2016). This trend is more worrisome when one looks at individual country profiles. Indeed, from 2006 to 2013 France experienced a 13% decrease in government spending on defence R&D; Germany -7%; Italy -41%; Spain -55%; Sweden -73%; and the UK -30% (European Defence Agency, 2016). While Germany experienced a 4% increase in defence R&T over the 2006-2013 period, and France witnessed a marginal drop of 1.3%, government spending on defence R&T decreased by 48% in Spain; -57% in Sweden; and -44% in the UK (European Defence Agency, 2016).[1]

This state of affairs is concerning when one considers that these states pledged to spend 20% of their total defence budgets on 'major new equipment' and 'related Research & Development' at the NATO Wales Summit in 2014 (NATO, 2014). Furthermore, despite these various national decreases in defence R&D the member states have been reluctant to engage in cooperative R&T endeavours. National R&T investment still overwhelmingly outweighs cross-border cooperation on defence R&T, which decreased over the 2008-2013 period in both absolute value (from €499 to €204 million) and as a share of total defence R&T (from 22% to 11%) (European Defence Agency, 2016).

These trends are even more concerning when one reflects on the changing nature of the global technology environment. Indeed, at present there is an acceleration in both the pace of technological development and the rate of diffusion', and this is being combined

[1] Italy did not report its defence R&T expenditures to the European Defence Agency over the 2006-2013 period.

with advanced manufacturing techniques that are in turn 'increasing the speed, adaptability and customization of production' while decreasing costs and waste (FitzGerald and Sayler, 2014: 9-10). For the defence sector, however, the costs associated with developing new defence systems and technologies are increasing, which requires more and not less investment in defence R&D and R&T (Kirkpatrick, 2004). Furthermore, the US Department of Defense is developing a 'Third Offset Strategy' that is geared to cultivating cutting-edge defence and civil R&T and R&D and the Department has requested US$18 billion[2] over the Future Years Defense Program (FYDP) (Mehta, 2016; Fiott, 2016). While precise statistics for China are difficult to ascertain, it is estimated by one scholar that 'China's spending on equipment would likely include as much as $10 billion in military research and development spending' (Bitzinger, 2015).

If the Preparatory Action is funded for €75 - €100 million over a three-year period this will be a realistic start, although it should be acknowledged that this is a small amount of money. For example, Sweden spent €71 million on defence R&D in 2013 alone (European Defence Agency, 2016). Likewise, it is estimated that the full development costs associated with the jointly developed European medium-altitude long-endurance (MALE) will likely total €1 billion. The French, German and Italian governments have already collectively spent €60 million on a two-year-long definition study (Osborne, 2015). In 2014, Britain and France signed a €166 million contract for a two-year feasibility study for the bilateral future combat air system (FCAS) development programme (UK Government, 2014). One cannot expect the Preparatory Action – or any future subsequent EDRP – to be an immediate *financial* 'game changer'. It is clear that the Preparatory Action is not the answer to all of Europe's defence research problems. While the Preparatory Action can potentially provide some leverage for national R&T/R&D programmes, it will not be able to change the mind-sets that European governments presently have towards investment in defence research. Thus, convincing participating Member States (pMS) that defence research is worth the investment at a national and European level is in many ways a more pressing task than simply convincing pMS to engage in greater EU-level cooperation on defence research.

COMPREHENSIVE MANAGEMENT OF DEFENCE INNOVATION

The Preparatory Action will mainly focus on increasing defence R&T and/or R&D efforts in Europe and improving the effectiveness of these efforts over the longer-term. It is indeed necessary to improve the level of available funds, since it appears that defence R&T and R&D investments have been the primary targets during subsequent rounds of budget cuts, despite the need to prepare for tomorrow's defence capacities. Nevertheless, beyond inducing pMS to allocate more resources to defence R&T and R&D, one may wonder how to deal with defence innovation more broadly and how to identify the most relevant level of action needed to maintain an innovative DTIB in Europe.

In this regard, a worrisome development would be a duplication of efforts not only between member states, but also between the different levels of defence initiatives. EU-

[2] Of this total the Pentagon plans to invest US$3 billion in A2/AD technologies, US$500 million on guided munitions challenges, US$3 billion on submarine and undersea challenges, US$3 billion on human-machine collaboration, US$1.7 billion on cyber and electronic warfare and US$500 million on wargaming, demonstrations and operational development (Mehta 2016).

level R&T and R&D efforts should complement national and industry-led efforts and not duplicate them. This then begs an important question: what kind of innovation is Europe looking for? It is obvious that states and firms have heterogeneous needs and objectives when dealing with defence innovation. It is therefore important to disaggregate defence innovation in order to identify the level that will most likely help achieve the appropriate outcomes.

During the Cold War technological evolutions used to drive the evolution of defence capabilities. The rapid rhythm of technological changes resulted in a quasi-planned obsolescence that favoured the quest for ever-greater performance. Since the 1990s, however, the rhythm of technological progress has slowed in defence systems because most major defence-related technology fields have reached a plateau (Bellais and Droff, 2016) in a way similar to what is observed in civilian business (Gordon, 2016). Therefore it is possible to consider different approaches to promoting innovation in the field of defence capabilities. This is important because the various CSDP-related research projects that may potentially emerge (e.g. capabilities, common standards, new technologies, etc.) will require different innovation approaches.

This trend does not mean that there is no need for basic and applied research. On the contrary, such research remains essential if one is to avoid strategic surprises and to test the military potential of emerging technologies. Nevertheless, with regard to more immediate military requirements and operations, capacity needs can rely on a different approach to innovation that focuses more on re-combining existing technology bricks and improving existing platforms rather than looking for radically new, high-performance, systems at the technology frontier (Henrotin, 2014). As Desportes (2009) notes, this form of innovation can better correspond to what armed forces need in order to achieve today's missions and it is much more affordable.

However, when analysing today's procurement processes in Europe it is clear that they remain characterised by a Cold War mind-set that is technology-driven and conditioned by the dynamics of planned obsolescence (Bellais, 2013). Both dimensions do not fit well together, and it could be useful to disaggregate *capability-driven innovation* (mainly pushed by short-run requirements) and *technology-driven innovation* (mainly for high-end, longer-term, perspectives). As intra-budgetary competition does not favour a longer-term perspective in many countries, the pMS could use the European level in order to focus on the most prospective, blue-sky research. Such a decision could also avoid conflicts of interest between the pMS due to technological and industrial legacies.

One should also analyse the complementarity between national and European funding with regard to different time frames. In fact, many states have to focus on short-term capabilities and only the largest states expect to invest in long-term projects. However, owing to budgetary constraints, even large states find it difficult to dedicate enough resources for medium- and long-term defence research. Accordingly, the scarcity of financial resources leads to a kind of myopia despite a clear perception that R&T and R&D investments could benefit armed forces over the long-term.

Therefore the EU could play a significant and very effective role if funding could support the most prospective defence research projects. Such funding could fill gaps not only in terms of technology mapping but also for dealing with intertemporal arbitrage. While it

seems overambitious to compare this institutional arrangement to what the Pentagon set up between armed forces and DARPA, this initiative could represent an interesting model for the EU. Indeed, DARPA has a clear mission to deal with long-term projects that do not correspond to obvious capability projects but that avoid strategic surprises induced by technology disruptions. As all pMS share this risk, the EU could use its sources to support technology scouting as a complement to the capability-oriented defence research managed by pMS.

This idea would, in fact, not require the creation of a dedicated agency with huge resources such as DARPA. What is required, however, is the coordination of technology roadmaps in order to clear the way for European funding for foresight projects. The structuring of such projects can rely on a subsidiarity principle, through which a lead nation could pilot the funding and then develop a pole of excellence in a given technology. Here it is critical to: first, avoid needless duplication; and second, to produce the minimum level of efforts needed to guarantee the effectiveness in acquiring the corresponding technology, granted that there is a budgetary threshold effect in technology acquisition (Setter and Tishler, 2006 and 2007).

Finally, it is also important to manage a real convergence between the DTIB and the civilian technological base. With regard to upstream technology and innovation, there are very limited differences between both sectors and so convergence would mean that armed forces could rely on an integrated technological base to reduces costs and maximise synergies. This is an additional argument in favour of an EU-level management of the most prospective defence research projects, since these projects could be fully integrated within the research Framework Programme under any EDRP. Convergence can reinforce existing innovation clusters over the long-term, it would allow Europe to achieve a higher degree of innovation and it could also improve security of supply for Europe's armed forces and reduce the defence burden.

Such an objective does not mean any dilution of defence research within the civilian technological base. This was a misleading approach visible during debates about dual-use in the 1990s (Guichard, 2004), where some used the idea of dual-use as a way to compensate for declining defence budgets by relying on civilian budgets in order to support the DTIB. Here the important point is to maximise the 'cumulativeness of knowledge' because technological knowledge is very rarely divisible, and the more knowledge interacts, the higher its value is (Foray, 2004). From this perspective, dual-use constitutes a means through which to consolidate Europe's entire knowledge and innovation base without discrimination in favour of either the defence or civilian bases. Incidentally, this objective constitutes a key feature of the Third Offset Strategy, which revisits the quest for a convergence between civilian and defence TIBs (Office of Technology Assessment, 1994, 1995) albeit from a proactive rather than defensive approach. By insisting on a duality of the defence and civilian TIBs, it will be possible to concentrate limited defence research funding on gaps that are not covered by commercial or institutional projects (at least in the short- or medium-term) and that guarantee the effectiveness of defence-related funding for defence capability development.

THE NEED TO AVOID CONFLICTING TECHNOLOGY ROADMAPS

The Preparatory Action has limited resources but it must prove the effectiveness and the usefulness of EU-funded defence research, otherwise it will be difficult to secure a defence-related line in the 2021-2027 EU R&D framework programme (FP9). Therefore one cannot accept that projects under the Preparatory Action compete or overlap with existing national initiatives. Unfortunately, up to now, there is no guarantee that such a situation will not appear. One can identify several risks associated with an EU-level funding of defence research resulting from the heterogeneous commitment and behaviour of pMS.

The first risk is that the Preparatory Action is seen as a justification for further national reductions in defence research, especially due to current budget constraints. This risk would be of growing concern if any future EDRP invests a sizeable amount of the multi-annual financial framework into defence research. The danger is that certain EU member states will view EU funding as a convenient reason to further decrease – or at least maintain at low levels – national defence research spending. This risk has a financial dimension, but it is also connected to the effectiveness of defence research in Europe, as mentioned previously. Indeed, if Preparatory Action funding comes to replace national funding, additional funding may not have a leverage effect at the supranational level. This would be a regrettable situation.

One key challenge will therefore be to ensure that the complementarity of investment afforded through the Preparatory Action does not give rise to complacency or free-riding. One should expect Preparatory Action funding to increase the effectiveness of defence research by favouring an effective cooperative approach able to deliver economies of scale and scope. Indeed, national defence research is not efficient today because each pMS does not spend enough to achieve an appropriate economy of scale and scope, but also because defence technology requires a minimal level of effort to produce significant results (Setter and Tishler, 2006 and 2007). Preparatory Action funding can be relevant if it improves the collective level of effort needed to reach an appropriate scale, which can then contribute to maintaining the European Defence Technological and Industrial Base (EDTIB).

A second, more insidious, risk consists of selecting non-significant technology for Preparatory Action projects. With an eye to avoiding cooperative schemes and preventing any proliferation of related knowledge, many states and industries would prefer to control critical technology through national funding. This is bound to limit the perimeters of Preparatory Action-sponsored projects to non-essential technology, significantly reducing the added value of a European dimension in defence research. Such discrimination is bound to significantly reduce the effectiveness of the Preparatory Action, both in positioning *vis-à-vis* national efforts and in achievable output, and this can jeopardise the next step in Europeanising defence research.

A third risk derives from the consequence of heterogeneous preferences between pMS. When analysing EDA statistics, it appears without doubt that the preferences of states with a large DTIB and other states are bound to diverge or even conflict. In this regard, it seems difficult to define a level playing field that can be ambitious enough while

securing the participation of all pMS. Two important issues are worth considering here. First, Preparatory Action funding could be limited to low-profile, lowest common denominator, projects that is likely to produce limited results and then harm any further step in Europeanising defence research. Second, states with a limited DTIB could ask for full access to knowledge resulting from high-profile projects that correspond to the core competencies of the most advanced pMS, but this may, in turn, lead the advanced pMS to reject any truly ambitious project.

It is therefore necessary to clarify the coordination between the Preparatory Action and ongoing national defence research plans *ex ante* to avoid damaging the initiative. Since its creation in 2004, the European Defence Agency has been working quite extensively on mapping technology gaps in Europe. It seems then possible to set up complementary technology roadmaps between the national and European levels. This would constitute a good method for optimising funds while also avoiding the aforementioned risks.

THE IMPLICATIONS OF EU DEFENCE RESEARCH

Perhaps one of the most interesting dimensions of the Preparatory Action relates to co-funding and how this may raise sensitive questions about Intellectual Property Rights. Modulating the way in which IPRs will be treated under the Preparatory Action will have potentially important political ramifications for the EU. For co-funded research programmes the member states, firms and institutions could each have a legitimate claim to IPRs, but fully-funded research projects by the EU – something that would be attractive to industry – would require a specific governance and management structure. The experiences of IPR management under the Horizon 2020 framework show that an emphasis has been placed on the dissemination of research results to stimulate wider innovation in the EU.[3] Yet the defence sector is unique because governments and firms are reluctant to freely share research results and information. Managing an IPR regime under the Preparatory Action will necessarily require that acceptable IPR conditions are put in place, otherwise there will be limited buy-in from industry.

Yet one must be aware of the political relevance of IPRs. If information is disseminated too widely in Europe through the Preparatory Action, then one should question whether the creation and duplication of industrial efforts and centres of excellence throughout Europe is a credible way of supporting a sustainable EDTIB. Here, one should recall the experiences of developing the European Space Agency's (ESA) regime for IPRs. Indeed, under the ESA IPR regime, industry became the owners of IPRs, despite the fact that they were the fruits of 100% ESA-funded projects. In time, ESA member governments expressed concern that this regime could lead to duplicate centres of excellence or, worse still, that the IPRs could be transferred to non-European countries or suppliers during mergers and takeovers. While the ESA has since tightened its rules on IPRs (Stjernevi and Katsampani, 2011: 172), the Preparatory Action for defence research should aim at an IPR regime that leads to a consolidation of DTIBs at the European level rather than the proliferation of technological know-how in the EU and beyond.

[3] The rules governing the exploitation and dissemination of results are enshrined in Article 41 of EU Regulation No 1290/2013 on the rules for participating and dissemination in the Horizon 2020 programme (11 December 2013).

If the Preparatory Action does give rise to a defence-specific IPR regime, then this may require that a single authority be given exclusive management of Preparatory Action/EDRP-induced IPRs. For example, by entrusting the European Defence Agency with exclusive management of IPRs it may be possible to use IPRs strategically to promote the creation of centres of excellence that provide the EDTIB with the appropriate scales of technological innovation and eventually production through the specialisation of existing poles. With an exclusive manager of IPRs in place, the Preparatory Action/EDRP could avoid a proliferation of technologies, a duplication of efforts and ensure that an EU perspective on defence research is maintained.

However, all of this implies a change in the role and functions of the European Commission and the European Defence Agency. As mappers of new technology areas, these institutions would find themselves on the supply side of the European defence market and so they could contribute to creating a unique armament market in Europe. On this basis, not only would industry perhaps have to change their perceptions of these two institutions, but both the Commission and EDA would take on a special responsibility for making the strategic and operational case for the investment in and use of specific defence technologies. This would require that these institutions ensure a defence and strategic perspective throughout the whole process of defence research. One way of building-in a defence perspective through the full cycle of defence research could be to adopt an EU 'defence research strategy' (Mauro and Thoma, 2016: 60).

While the European Defence Agency has considerably more knowledge of and capacity to identify and map new technology areas with military strategy in mind, the European Commission will find itself in unchartered territory. For the Commission, a new responsibility for strategic investments in the defence sector may require that it work much more closely with the European Defence Agency, the EU Military Committee and with bodies housed in the European External Action Service such as the EU Military Staff (Mauro and Thoma, 2016: 58). Indeed, the GoP report already refers to the EDA as 'the most natural pick to play the role of the Executive and Implementing Agency' (EUISS, 2016: 68). Over the longer-term, however, should the EU move towards a European Defence Research Programme then questions about institutional arrangements for EU defence research may likely emerge. Which EU institution (or combination of institutions) could become Europe's 'DARPA'? Without getting ahead of oneself, such a question not only makes one think about whether the EU has the capacity to engage in the aforementioned technology mapping exercises, but it also forces one to engage with key definitions: what is 'Europe'? What is 'defence'?

This last question is essential. Indeed, it will be crucial to tackle how precisely the Preparatory Action – and indeed any future EDRP – will help meet Europe's future operational needs. The Preparatory Action will be put exclusively to the service of the CSDP, but the EU's present operational footprint – which is largely civilian – means that a whole swathe of technology areas could potentially be overlooked. While the High Representative/Vice President's forthcoming *EU Global Strategy* will no doubt clarify the future role and shape of the CSDP, one could argue that restricting the Preparatory Action to CSDP-related research may hinder some forms of technological innovation. Therefore, while the Preparatory Action must address the CSDP it should focus on Europe's longer-term technological innovation, the consolidation of the EDTIB, the convergence of the civilian and defence TIBs and improving security of supply. It should

avoid addressing immediate capability gaps or present-day operational and security paradigms.

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CONCLUSION

This policy paper has looked at the challenges facing the forthcoming Preparatory Action on CSDP-related research, and it has outlined some of the possible implications of EU-level funding for defence research. €75 - €100 million is not a sizeable amount of money when one considers the challenges facing the European defence sector, but, if used correctly, such an amount could be used to leverage national initiatives and/or make strategic investments on behalf of the European Union. A successful Preparatory Action is essential if a dedicated budget line in the multi-annual financial framework is to be achieved in the future. To do this, the EU should focus its efforts on blue-sky research that is technology-driven rather than capability-driven. Without a credible Preparatory Action that adds real value to defence research in Europe, the chances of Europeanising defence research will be greatly diminished. Thus, the Preparatory Action is not a 'game changer' as yet – but it could very well be. If the Preparatory Action does pave the way for dedicated EU funds for defence research under a European Defence Research Programme, this could represent a shift in the way that the EU regards and supports defence research.

Yet there will clearly be challenges to a successful rolling out of the Preparatory Action. This policy paper has argued that the Preparatory Action invites Europe to think about how it will comprehensively manage defence innovation. The paper argues that the Preparatory Action should not duplicate national defence R&T/R&D efforts and it should focus on strategic technology investments rather than immediate capability concerns. Furthermore, the Preparatory Action should not lead to further reductions in national defence R&T/R&D spending but it can help create a convergence between Europe's defence and civilian technological and industrial bases. The Preparatory Action could help map and coordinate national- and European-level defence research efforts and it could inculcate the importance of defence innovation across all EU institutions and EU member states. This paper has also observed that over the longer-term EU funding for defence research may require a rationalisation of the EU's institutional architecture. Should EU funding for defence research require that EU institutions make strategic investments in specific technology areas, then these very same institutions may need to alter their working practices. ■

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