

Sociotechnical Imaginaries of EU Defence: The Past and the Future in the European Defence Fund

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Abstract

In this article we investigate how a particular vision of the future of EU defence has embedded itself into different arenas of EU politics over decades, and is currently gaining material expression in the European Defence Fund (EDF). Through an historiographic approach, we traced the development of a particular narrative on security, innovation, research, and economic growth based on fears of technology gaps and dependence on the US, and a belief in the potential of military R&D to produce civilian benefits. We provide an alternative reading of the emergence of the EDF by drawing on literature within Science and Technology Studies, in particular the concept of sociotechnical imaginaries, to highlight wider socio-political dimensions of defence technologies and expand debates on EU defence.

Keywords: European defence fund; innovation policy; industrial policy; sociotechnical imaginaries; strategic autonomy

Introduction

In the last four years the EU has considerably expanded its commitment to defence matters. In May 2017 it launched a preparatory action on defence research, aiming to support defence-related research and development (R&D) directly with EU funds for the first time. The scheme was framed both as a concrete step to demonstrate the added value of EU-supported defence research and as an initial stage in the establishment of a substantial European defence fund (EDF). At the end of 2017 the EU activated the permanent structured cooperation (PESCO) scheme, a framework allowing interested EU member states to develop defence capabilities jointly for use in EU military operations while also maximizing defence-spending effectiveness. Finally, in 2020 the EU agreed both on the EDF parameters and on its budget of €7.953 billion for defence research and development for the period 2021–27.

As contemporary defence decisions increasingly depend on technological advancements and R&D they become enmeshed with industrial and innovation policies, which are part of the internal market. Indeed, the EDF has its legal basis in industrial policy and the EU's expanded commitment to defence R&D is understood by the Commission and some member states as mostly market driven, rather than strategy oriented (see, for example, Rynning, 2020), with military innovation seen as a trigger for economic development and industrial advancement in other sectors. This aspect of the EDF, however, is under-researched, as our literature review will show.

The aims of this article are twofold. First, by using a historiographical approach tracing the emergence of the EDF, we intend to argue that understanding its non-defence policy context is important if researchers are to engage with it critically. Second, we intend to

make the case that drawing from science and technology studies (STS), which has examined the innovation-security-industry interface more closely than EU studies has, offers novel insights. While there is growing interest in what STS approaches beyond Latourian actor-network theory might bring to the engagement of critical security studies with technology (Bellanova *et al.*, 2020; Evans *et al.*, 2020), we suggest that EU studies as a discipline can also benefit from such interactions.

Our argument is that the EDF is better understood as an outcome of a long process through which certain beliefs about defence technologies and industrial innovation became institutionalized in some EU networks, particularly in the European Commission (EC). We trace the development of a particular narrative on security, innovation, research and economic growth based on fears of technology gaps with, and dependence on, the USA in particular. We hypothesize that this narrative became deeply embedded in successive policy initiatives and research programmes and that this sociotechnical vision or imaginary of the future, that has existed since the late 1960s, is now materializing in the EDF. We engage with the STS literature on sociotechnical imaginaries that analyses how political outcomes are shaped by collectively held visions of desired futures that are attainable through, and supportive of, advances in science and technology (Jasanoff, 2015; also Ballo, 2015; Konrad and Böhle, 2019; Jasanoff and Kim, 2009; Jasanoff, 2015).

Methodologically, this article uses a historiographical approach. As Daddow (2004) suggests, historiography, as opposed to history *per se*, attempts to uncover how historical texts are put together, and how interpretations emerge and are fostered across time. In other words, it is about narrating the past, and how that past is understood, by the policy communities involved. We look at what key texts stated but also at how they were interpreted at the time. The texts analysed include EU official documents on security and defence R&D initiatives across time (e.g Council of the EU, 2020), EU industrial strategic documents (including the 2020 European industry strategy), policy reports emanating from ad hoc working groups (such as the Tindemans' report and the reports from the Groups of Personalities for both security and defence) and reports from interest groups (including the Kangaroo group and the Aerospace and Defence Industries Association of Europe – ASD). As Dewar (2017) argues, a historiographical approach reveals the continuity of themes but also places them in the historical and political context from which they emerged.

Bringing history back in allows us not just to provide a richer account of the emergence of the EDF than currently exists, but also to critically analyse the contemporary materialization of the sociotechnical imaginary. By putting technology and innovation at the centre of our analysis, our theoretical and methodological options enable alternative understandings of key contemporary defence policies in the EU and expand our views on the growing role of the EC in defence matters (Blauberger and Weiss, 2013; Lavallée, 2011; Mörth, 2000; Strikwerda, 2017).

The article begins by reviewing existing perspectives on the EDF in the EU studies literature. It then proposes that a theoretical framework based on the STS concept of sociotechnical imaginaries offers novel insights. After describing how the framework will be operationalized, we take a historiographical approach to analysing where these beliefs originated, how they became embedded and how they are gradually materializing in, first, EU support for security research and then the EDF. Our discussion of the results

underpins our argument that these developments cannot be understood solely in the context of defence politics but need to consider imaginaries of innovation and industrial governance as well.

Existing Perspectives

How have recent developments in EU defence been understood? The literature presents three main perspectives. First, much of the academic and think-tank literature understands them as the EU pursuing strategic autonomy in response to a changing external security environment (Biscop, 2018; Fiott, 2018; Tardy, 2018; Domecq, 2019). This new geostrategic context is characterized by Russia's assertiveness on its the eastern flank, US disengagement with European security (particularly, but not only, during the Trump Administration), the rise of China as a military power and the uncertainties involving the impact of Brexit on EU defence (Galbreath *et al.*, 2019). Here, the EDF is widely seen as a welcome break with the past and as evidence of the EU's new-found seriousness about defence and strategic autonomy.

The other two perspectives focus on continuity more than on change. The first of these claims that the EDF can be explained by neo-functional logic of spillover. Haroche argues that the EDF 'illustrates a full cycle of supranational dynamics at every level, including the origins, governance and consequences of the policy' and as such, 'the EDF is closer to the logic of "old" neofunctionalism' (Haroche, 2020 p. 854). According to this perspective, the Commission relied on the dysfunctionalities of intergovernmental cooperation in the field of defence, on the functionality of its own instruments in other policy areas and on the functional connection between its own economic competences and the issue of defence industrial cooperation. This offensive spillover enabled the Commission to export supranational governance to the area of defence (Haroche, 2020 p. 862). The second perspective that emphasizes continuity relies upon the dynamics of interest groups and lobby capture (Schilde, 2017). Here, the literature highlights how defence firms are both advisers on long-term policy decisions and beneficiaries of those same decisions, in a logic similar to what had happened at the beginning of the security research programme. From this perspective, the EDF is interpreted to be another stage of the defence industrial lobby's capture of the system (Jones, 2017; Vranken, 2017; Goxho, 2019).

The role of interest groups has been thoroughly explored in political science. The capacity of interest groups to change collective understandings of some issues, in particular, has been a topic of concern of the literature on framing, which stretches beyond interest groups and builds on the acknowledgement that policy decisions are 'greatly affected by the way issues are understood collectively by policy-makers and the public' (Baumgartner and Mahoney, 2008 p. 435; see also Chong and Druckman, 2007), especially in political systems characterized by 'competing constituencies and contested competences' (Daviter, 2007 p. 654) such as the EU. While this approach is valuable to understand competence allocation and policy change, we believe our empirical material requires a perspective that looks at wider temporal trends, that puts emphasis on visions of the future (and not just on contemporary political decision-making) and that has the socio-politics of technological development at its core.

Learning from Science and Technology Studies

The imagination of technology-driven futures is a staple of foresight planning for states and often defines the policies of the present. With its focus on the societal aspects surrounding technology and science developments, the literature on science and technology studies (STS) offers different possibilities for studying the way conceptualizations of the future shape policymaking of the present. These possibilities include theoretical work on a sociology of the future in relation to technology and time (Selin, 2008); a sociology of expectations in science and technology (Borup *et al.*, 2006); the regulation of future developments in science and technology (Hurlbut, 2015); the normative dimension of expectations about sociotechnical futures (Berkhout, 2006) and a broad reflection on how the capacity to imagine futures is an important element of social and political life (Ballo, 2015). The latter point is most aptly captured by the concept of sociotechnical imaginaries, introduced by Jasanoff and Kim and developed by others (Jasanoff and Kim, 2009; Ballo, 2015; Jasanoff, 2015; Konrad and Böhle, 2019). Sociotechnical imaginaries are defined as:

collectively held, institutionally stabilized, and publicly performed visions of desired futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology. (Jasanoff, 2015 p. 4)

In other words, imaginaries in this sense ‘at once describe attainable futures and prescribe futures that states believe ought to be attained’ (Jasanoff and Kim, 2009 p. 120). For this reason they contribute to framing decision-making processes in different scientific and technological fields and are part of the broad co-production of science and social order (Jasanoff, 2004; see Ezrahi, 1992, 2004 and Sclove, 1995 for a focus on technology in democratic contexts). Some of the decisions framed by sociotechnical imaginaries are the ones justifying expenditure on particular technologies and science funding, as well as the prioritization of some scientific domains over others. As Hurlbut argues ‘indeed it is the very work of imagining such futures that brings them into being, thereby creating a semblance of inevitability where agency and habits of deference are at work’ (Hurlbut, 2015 p. 147).

The concept of socio-technical imaginaries pushes us to ask why, out of all the possible visions of the future, do certain orderings come to the fore? Berkhout argues that ‘visions of the future are both ubiquitous and context-specific’ (Berkhout, 2006 p. 299), in the sense that agents ‘will act in relation to private visions of the future that are complexly related to shared or collective visions’ (Berkhout, 2006 p. 299). This is particularly relevant in the context of a political entity such as the EU, which has been built around an imagined sense of political community (Anderson, 1983). The existence of a pan-European imagination, irrespective of its specific content, is of relevance for the logic of sociotechnical imaginaries. As explained by Jasanoff and Kim, ‘National imaginations can penetrate the very designs and practices of scientific research and technological development’ (Jasanoff and Kim, 2009 p. 124), which in turn produces a wide array of results: ‘the resulting politics of science and technology may shape not only the narrow issues surrounding those specific enterprises but also wider social and political understandings about a nation’s past, present and future’ (Jasanoff and Kim, 2009 p. 124).

Recognizing the capacity of imagined futures to produce contemporary political results implies ascribing politics to the field of techno-scientific imagination (Martins and

Ahmad, 2020). For this reason, Berkhout builds on Michael's (2000) work on the performative dimension of imaginaries to claim that the 'process of representing images of the future is not, in general, done in a disinterested way' (Berkhout, 2006 p. 299). Therefore 'substantial resources, technological and institutional, are devoted to the problem of realizing and transmitting visions of the future' (Berkhout, 2006 p. 300; see also Ballo, 2015 pp. 12–13; Jasanoff, 2015 pp. 10–14). At the same time, Hurlbut (2015) suggests that it is important to consider when the first visions were produced, who was involved and how they saw the potential governance and regulation of new types of technology.

We will draw on these insights to argue that current EU innovation, industrial and defence policies are entwined in wide political and social understandings about the past, present and future. We will argue that an important but understudied element of their interactions is the policy motivation of preventing 'a deep political and technological dependence on the United States' (Marcum, 1986 p. 35). The possibility of strategic autonomy being viewed as a desirable policy outcome in these policy areas is not a new idea. Through our historiography we will show how a collectively held future vision of how this may be possible, through the direction of advances in science and technology, was gradually institutionally stabilized and is now being publicly performed as the EDF.

In the remaining sections of this article we will use sociotechnical imaginaries as the theoretical concept framing our analysis. We build on the six elements of Jasanoff's definition of this concept: (1) a vision of a desired future; (2) collectively held; (3) institutionally stabilized; (4) publicly performed; (5) animated by shared understandings of forms of social life and social order and (6) attainable through, and supportive of, advances in science and technology. We will show how the ideas about a desired, future EU defence emerged in the 1960s and how several initiatives tried to enact them; how these ideas were promoted for decades and stabilized in the early 2000s and how the EDF constitutes the materialization of these ideas through public performance and institutional anchoring in both industrial and defence bureaucracies.

A New Historiography of EU Defence: The Geopolitics-Industry-Innovation Triangle

The Early Days: Establishing Shared Visions

The idea of the EC being involved in defence research is not a new one. From the 1960s onwards, because of the transatlantic military spending gap, especially on R&D of military and space technology, a concern emerged about the ability of European states to fight alongside the USA due to their less advanced equipment. It was argued that, both to maintain the existing transatlantic social order and to achieve potentially greater strategic autonomy, should that be required, it was necessary to invest in defence technology. This was also a possible pathway for the European integration project to pursue defence-related objectives after the traumatic failure of the European Defence Community in 1954.

More importantly, there was a growing sense, among certain European elites, that a technological gap was opening up between Europe and the USA. In *The American Challenge*, Servan-Schreiber (1968) explains that this was not merely a gap in knowledge; rather, it was related to the organization of American industry, to the

entrepreneurial spirit of its workers and to the responsibility transferred to each individual. Sandholtz (1992) argued that a similar diagnosis was made of Japanese success, where the state was driving technological development. European observers concluded that technological innovation was based on structural factors that required similar efforts from Europe to catch up. Europeans were also concerned about a brain drain of scientists and engineers to the USA caused by the technology gap (Salomon, 1977). These views were reflected in the 1976 Tindemans report on the European communities, which recommended a common defence policy, including the establishment of an armaments agency and a common industrial policy on armaments manufacture (European Communities, 1976). For the first time, European institutions were being presented with a clear message: defence capacity, strategic autonomy and technological innovation should be achieved by a defence industrial policy that required their support. We argue that the Tindemans report represents the moment that a shared vision of the future, which would tackle these varied concerns, was publicly performed.

While the Tindemans recommendations were not pursued, the influential Kangaroo group, founded in 1979, had as one of its goals the achievement of a common security and defence policy and was – and still remains today – a supporter of these ideas. The Kangaroo group, which brings together like-minded figures from EU institutions with academics and business figures, became a forum for discussions on the topic and thus both institutionally stabilized and publicly performed this shared vision in multiple venues. Karl von Wogau, then an influential long-serving member of the European Parliament (EP) and the Kangaroo group, claims the group was important, for example, in elaborating how internal market rules might be applied to the defence sector (von Wogau, 2004). Slijper (2005) asserts that defence industry figures became active in the group from the 1980s, finding it supported their interests. In other words, a pan-European shared imagination about the future of defence had come to exist, and it was attainable through, and supportive of, advances in science and technology.

Industrial policy formed a vital part of this thinking. Early EC responses to concerns about the transatlantic technology gap had clear industrial policy goals and indeed came at the behest of 12 firms who lobbied for support (Ruigrok and van Tulder, 1995). The EC developed the European strategic programmes on research in information technology (1984–98) (ESPRIT), as well as a parallel programme in telecommunications, RACE, which specifically aimed at enhancing the competitiveness of European firms and funded much dual-use research (Luukkonen, 2002). ESPRIT was also quite unusual: in an effort to make sceptical firms cooperate with each other, this programme involved them in the agenda-setting process, even though they would become beneficiaries (Creasey, 1988). As Peterson (1991 p. 274) points out, the governance of the programmes was highly technocratic, and industry and the Commission had substantive autonomy from member states, forming tightly knit policy communities. Ruigrok and van Tulder (1995) estimate that the 12 original firms participated in just under 70 per cent of the projects and received 50 per cent of the funding. Among this group of firms were Thomson-CSF (now Thales), GEC and Plessey (now BAE Systems). As early as 1988 Creasey recommended the ESPRIT model for any future defence research programme (Creasey, 1988). Indeed, as we will show below, this model of industry involvement in shaping new programmes that will eventually benefit them was replicated in the security research programme and in the EDF. This form of innovation governance solidified, through institutionalization,

collectively held beliefs about how a technologically driven innovation policy should function and the place of defence industry within it.

The idea that defence industry is key to wider economic progress is also important in this pan-European imaginary. The Prodi Commission (1999–2004) included commissioners Liikanen and Busquin, who were both firmly convinced of the importance of the defence industry for Europe's economic future and who acted as energetic policy entrepreneurs. Giles Merritt, the director of the think tank Security & Defence Agenda from 2002 to 2014, argued that the idea that Europe could solve its high technology problems by strengthening its defence industry seems to have been firmly embedded in Commission thinking from this point onwards (Merritt, 2004 p. 216). It is also around this time that a more formal defence industrial lobby emerged, benefitting from the existence of a group of policy-makers coalescing around a set of ideas and beliefs. By the late 1990s firms were also organizing through industry associations (EDIG, AECMA and EuroSpace) to influence the policymaking process. Schilde argued that interest groups in the field of EU security and defence could change political outcomes in Brussels because they provide 'sources of external capacity, which in turn can produce authority over time' (Schildt, 2017 p. 52).

Institutionally Stabilizing the Imaginary

Throughout the 1990s the EC tried to gain a foothold in the governance of defence industrial policy. A series of communiqués was issued, first from the perspective of the defence industry as a strategic industry in the early 1990s and then from a free market perspective in 1996 and 1997 (Mawdsley, 2003). These efforts, however, failed to gain traction with member states and it was not until the early 2000s that a series of industry-led reports on different sectors of the defence industry (STAR 21 on aerospace in 2002, LeaderSHIP on shipbuilding in 2001 and ACARE in 2002 on aeronautics), with a follow up Commission 2003 communiqué on defence equipment, that the Commission really attracted political interest (EC, 2003). The reports claimed that technological innovation in the defence and aerospace fields was key to general economic success for the EU and argued that the EU risked falling further behind the USA. The similarity of the themes of the reports and recommendations to the Tindemans report was noted by some commentators (de Defensa, 2002). In our reading, these documents helped to embed the sociotechnical imaginary into both Commission thinking and political discourse. In other words, the codification of these shared visions in official documents acted as a further stage of institutionalization.

How were these actions understood in the contemporaneous academic literature? For some, it was about the trajectory of European integration. Guay (1996, 1997), for example, claimed that the role of the Commission in shaping the European defence industry and equipment markets was underestimated. Using neofunctionalist reasoning, he claimed that the Commission's civilian policy actions in the areas of competition policy, science and technology and public procurement led, via a spillover mechanism, to the emergence of policy initiatives in the defence industrial sector.

In contrast, intergovernmentalists explained that the character of European armaments cooperation had been determined by the desire of national governments to protect national sovereignty and control over armaments policies combined with the

unbridgeable gap between large and small European countries (Hayward, 1997; Taylor, 1997). From this perspective, the limitations of the Commission's activity were clear – there were many initiatives, but without member state willingness, little action emerged.

Perhaps the most illuminating of these early contributions, and more akin to our own approach, were by Mörth and Britz (Mörth, 2000; Mörth and Britz, 2004) who built on the work of those who identified the Commission as a major actor but tried to explain its comparative failure by considering the governance characteristics of 'framing' (Mörth, 2000) and 'organising' (Mörth and Britz, 2004). They argued that the Commission could have played the role Guay claimed for it had it not been for its internal battles and the relative success of member states in creating alternative intergovernmental organizational fields (such as the Organisation for Joint Armament Co-operation, OCCAR and the Framework Agreement). Mörth (2000) argued that rivalry between the then industry and external relations commissioners (Bangemann and van den Broek) about whose portfolio the issue belonged to prevented the proposals being presented as successfully as they could have been, because the Commission was not united. When later in 2002–3 the Commission came to an agreement around industrial policy as the field to organize their action on defence industry, they did gain attention from member states.

While we agree with Mörth and Britz in their interpretation of this particular critical juncture, we would argue that our approach adds value by tracing the long-term gradual institutionalization of collective beliefs about defence industry and innovation and that the stabilization around industrial policy as the political and, importantly, legal, basis for Commission action is another stage of the institutionalization of the sociotechnical imaginary. Indeed, understanding that the EDF emerges from these dynamics and not from within the Common Security and Defence Policy (CSDP) is an important part of our argument.

Publicly Performing the Imaginary: The Security Research Programme

The creation of a stable institutional home for the sociotechnical imaginary was now timely. While it was predominantly intergovernmental, the CSDP had been launched in 1999–2000, reinvigorating debates among the member states about capability gaps with the USA and the need for enhanced strategic autonomy. Meanwhile the USA had, post 9/11, started a major programme of technological investment in homeland security research, which, in turn reawakened European concerns about strategic industries, transatlantic technology gaps and the linkage of economic growth to investment in security and defence research (Mawdsley, 2018). This opened up political space for the first real public performance of the sociotechnical imaginary: the EU security research programme.

Under the heading 'Towards a more coherent European advanced security research effort', the Commission called for the increased coordination of security research (EC, 2003). However, the Commission's involvement in this area was controversial both politically and legally. The Commission set up a Group of Personalities (GoP) made up of representatives of the defence industries, as well as former and (then) current EU and member state officials, to provide guidance on future policy developments in the area. The 2004 GoP report made the case that there was no real difference between military

and civilian research and that defence and security were interchangeable, and pointed to US investment in homeland security as a further example of how the EU was falling behind (GoP, 2004). The ambiguity produced by these claims allowed security research funding to gain greater political support than might otherwise have been the case (Edler and James, 2015). The report was adopted enthusiastically by the Commission and was fundamental in shaping the civilian security research priority in the 7th Framework Programme (EC, 2004). The resulting programme had clear industrial policy goals (much like its 1980s predecessors like ESPRIT) even if they were not particularly successful (Mawdsley, 2018). As time eventually showed, it was also a necessary legal and political bridge into funding defence research.

Indeed, due to its civilian nature, the security research programme prevented direct funding of defence and military technology but it enabled funding for dual-use technology. This provision allowing the use of EU research funds to support the development of dual-use technology has been pivotal for funding the European defence industries (Jones, 2017; Martins and Ahmad, 2020). While the security research programme was nominally purely civilian and justified by the need to respond to terrorism and increase internal security, it was criticized for its close alignment with the interests of defence firms. Bigo and Jeandesboz concluded that ‘major defense and security companies have played a key role in the definition of the orientation and priorities of the EU’s research and development policy for security-related technical systems’ (Bigo and Jeandesboz, 2010 p. 1) and were major beneficiaries, which has been equated with their over-representation on advisory groups (Jeandesboz and Ragazzi, 2010). Boros also points to the over-representation of members of the two formal lobby associations, ASD and the European Organisation for Security, in both these advisory groups and as expert consultants (Boros, 2016). Can it be concluded, then, that the security research programme is nothing more than an example of highly successful lobbying by defence firms?

The problem with this categorization is that it neglects the ways in which this outcome met the interests of the Commission, which, as we showed, had been trying to find an entry point into the defence policy field. Citi (2014), for example, saw the security research programme as a case of Commission competence creep. Edler and James (2015) also made a persuasive case that the entrepreneurial behaviour of individual officials in the Commission, with personal links to defence industry, enabled the Commission to act as a supranational policy entrepreneur, while also pointing to the important supportive role played by key members of the EP. We would thus argue that the public performance of the security research programme further stabilized and institutionalized a policy community of EU figures and defence firms, which was mutually beneficial and based on long-lasting shared beliefs about the role defence firms and technologies should play in an imagined future.

The European Defence Fund

The security research programme was important for allowing further developments that led to the EDF. It fostered the emergence and solidification of a common European security culture and community field (Lavallée, 2011). Additionally, it created a *modus operandi* that was later revisited, with some adaptations, with the EDF. It entailed the creation of a GoP for providing policy guidance and recommendations, a set of eligibility

criteria requiring mandatory cross-national collaboration and a project-based funding system largely reliant upon open calls for proposals with nevertheless pre-defined topics, fostering cross-sectoral cooperation between different actors, including both for-profit entities (namely defence industries and tech companies) and public bodies (Martins and Küsters, 2019).

While the security research programme and the EDF share many similarities, they also have important differences. The most significant one deals with the nature of the programmes: while the security research programme was, formally, civilian in nature, the EDF targets R&D activities that are expected to have an impact on military and defence capabilities, knowledge and technology. Second, whereas the security research programme aimed first and foremost at increasing the levels of security within the EU (while simultaneously having industrial impact), the EDF is formally presented as an industrial policy: it aims to have an impact not only on the security and strategic dimensions but also on the EU's wide economic, innovation and industrial outlook. Additional characteristics of the EDF relate to the different context from which it emerged: the new legal and political environment created by the Treaty of Lisbon, the pressure of budget cuts resulting from the financial crisis, the Juncker Commission's push for more defence, and the institutional competition between the Commission and the EDA (James, 2018 p. 17).

How does the EDF materialize the sociotechnical imaginary of EU defence? In the foreword to the 2016 GoP report 'European Defence Research: The case for an EU-funded defence R&T programme' (EUISS, 2016), the then EU Commissioner for internal market, industry, entrepreneurship and SMEs, Elżbieta Bieńkowska, claimed that the decrease in national spending on defence R&D 'has serious long-term implications for the competitiveness of our technological and industrial base' and that the 'Commission is determined to do all it can to reverse this trend' (EUISS, 2016 p. 9). The preamble to the resolution establishing the EDF states that 'following an integrated approach and in order to contribute to the enhancement of the competitiveness and innovation capacity of the Union's defence industry, a European Defence Fund should be established' (Preamble point 3, EP and Council of the EU, 2019 p. 14).

The report of the GoP presents nine different recommendations organized in terms of principles (1–3), modalities (4–6) and resources (7–9). These measures were adopted almost fully in all defence-related documents, policies and the legislative acts were adopted immediately after the report's release. The most relevant of these EU documents are the European defence action plan, the preparatory action on defence research, the European defence industrial development programme and the EDF.

More importantly, the legal basis chosen for the EDF belongs to industry and technology policies. The articles invoked are articles 173, 182, 183 and 188 of the Treaty on the Functioning of the European Union (TFEU), under the titles 'industry' and 'research and technological development and space'. Art. 173 TFEU constitutes the legal basis for actions aimed at 'encouraging an environment favourable to the development of undertakings throughout the Union, particularly SMEs, favourable to cooperation between undertakings and fostering better exploitation of the industrial potential of policies of innovation, research and technological development' (EP and Council of the EU, 2019 p. 5). The choice of this legal basis formally makes the EDF an industrial policy, which is crucial for its materialization of the sociotechnical imaginary of EU defence.

Additional evidence of the presence of the sociotechnical imaginary comes in the EDF objectives. Article 3 of the EDF regulation states that its general objective is ‘to foster the competitiveness, efficiency and innovation capacity of the European defence technological and industrial base throughout the Union, which contributes to the Union strategic autonomy and its freedom of action, (...) and fostering the better exploitation of the industrial potential of innovation, research and technological development, at each stage of the industrial life cycle of defence products and technologies’. The focus on SMEs and the importance attached to the EDF’s industrial potential makes strategic and industrial objectives fundamentally interconnected.

New Visions for European Industry

The emergence of the EDF is taking place in a context of increasing EU engagement with industrial innovation. Based on the contents of three 2020 EU documents (‘A New Industrial Strategy for Europe’ [EC, 2020], the Council Conclusions on Security and Defence of June 2020 [Council of the EU, 2020] and a November 2020 speech on these issues by Thierry Breton, Commissioner for Defence, Industry and Space [Breton, 2020]) we will briefly outline how EU institutions currently publicly perform the sociotechnical imaginary.

In 2020, the Commission published ‘A New Industrial Strategy for Europe’ and in the section titled ‘Reinforcing Europe’s industrial and strategic autonomy’ it describes defence industry as ‘essential for Europe’s future’, labelling it a strategic industry (EC, 2020 p. 15). This is because, they believe, a fragmented defence industrial landscape will not be able to build the next generation of armaments and would thereby risk both European strategic autonomy and the EU’s ability to act as a security provider (EC, 2020 p. 15).

The document describes strategic autonomy as reducing dependence on others. The Council Conclusions on Security and Defence from June 2020, responding (in part) to the strategy, call on the Commission to address ‘the negative consequences of dependencies’ (Council of the EU, 2020 p. 10). Commissioner Breton (2020), in turn, develops the concept further, applying it to the internal market and claiming it is essential to reduce industrial and technological dependencies and that there is a need for activist industrial policy from the EU to enable this – while defining the defence industrial sector as a key one. The industrial strategy urges greater synergy between the defence, space and cyber sectors, pledging to support this through EU programmes (EC, 2020 p. 16). In line with the Commission’s judgement, the Council called for specific budgets tied to disruptive technologies (Council of the EU, 2020). Commissioner Breton (2020) also supports specific EDF funding for disruptive technologies and makes explicit reference to the ability of the civilian sector to benefit from defence innovation.

Discussion

Our historiography has traced the emergence of these ideas about the future of EU defence and how they were promoted and nourished over the decades by the EC. Yet, while the imaginary is strongly embedded across EU institutions and is being translated into material reality through the EDF, understanding where the thinking comes from and, importantly, who and what it excludes, opens new avenues for enquiry. Our theoretical

framework understands sociotechnical imaginaries as being collectively held, institutionally stabilized and publicly performed. Our analysis shows that this imaginary has been collectively held for decades by a number of key personalities and working groups in the corridors and offices of the EC, the EP, the main security and defence industries in Europe and, more recently, the EDA. These actors provide that imaginary with institutional stability and public performativity.

This perspective allows us to interpret key dynamics around the EDF in novel ways. The GoP, created by the Commission to provide policy guidance and recommendations on developments on EU defence, acts as a form of pre-emptive regulation by the ‘experts’ of military technology and innovation, along the lines explained by Hurlbut (2015). The fact that the GoP – gathering largely likeminded people from the EU institutions, the member states and the defence industries – was created and convened by the EC indicates that it serves as validator of that vision that the Commission had had for decades. This interpretation sheds lights on the security politics of innovation in the EU (Martins and Ahmad, 2020) and confirms the findings in the STS literature showing that the ‘process of representing images of the future is not, in general, done in a disinterested way’ (Berkhout, 2006 p. 299). Moreover, it may be promising economically much more than is actually deliverable. This kind of dynamic opens up space for legitimate criticism from non-governmental organizations, transparency watchdogs and engaged sectors of academia. Yet our research shows that this not just a case of lobby capture, but rather a usage of the interest group to reinforce and validate a decision that had already been made. In other words, we suggest that this decision was built upon a particular sociotechnical imaginary of EU defence technology that has embedded itself over decades.

Our theoretical framework proposes that it is important to consider when the first visions were produced, who was involved and how they saw the potential governance and regulation of new types of technology. While in some ways our analysis confirms parts of Haroche’s (2020) argument that neofunctionalist logics help to unravel the puzzle of the emergence of the EDF (with the same logic previously argued by Guay in the 1990s), spillover does not entirely capture the dynamics at stake. The spillover logic requires the existence of a temporal sequence, in which the EDF would have emerged *after* and *as a product of* developments in other areas. In our argument, by centring the sociotechnical imaginary, the EDF materializes and translates an idea that has persisted for decades, but one that has been constantly reframed (Mörth, 2000; Mörth and Britz, 2004) by a changing constellation of actors seizing political opportunities. This proposed centrality of the sociotechnical imaginary enables us to understand the EDF neither just as an industrial policy, as its legal basis suggests, nor just as an instrument at the service of Europe’s strategic autonomy in geopolitical issues, as some commentators highlight, but rather as a complex combination of both. Indeed, the co-existence of these two dimensions is crucial for the materialization of the idea of a future for EU defence where innovation in defence research would spin off to the civilian market and contribute to European industrial and scientific advancements. In the jargon of STS, these shared understandings of forms of social life and social order are, therefore, attainable through and supportive of, advances in science and technology.

The decision to situate the EDF in the Commission, instead of in other more obvious security and defence institutions, is relevant. As explained in the historiography section, questions about whether armaments policy belongs in the single market, innovation or

external relations portfolio prevented the Commission from acting in a coherent fashion. The firm legal anchoring of the EDF in treaty industry provisions has now clarified the issue. From a sociotechnical imaginaries viewpoint, this means that the reorganization of the Von der Leyen Commission, where industry and defence are now part of the same directorate-general, contributes to the public performance of the imaginary and its institutional stabilization.

In sum, we argue that, while all three of the dominant perspectives of the EDF (namely, a break with the past due to the political momentum behind the CSDP, neofunctionalism, and lobby capture) offer interesting insights in the emergence of the EDF, there is a real need to recognize the way in which the fund is entwined in long-held ideas about innovation, defence and industry in Europe. Our STS-based theoretical framework, we believe, offers a richer account of the EDF's genesis and opens up new avenues for scholars to engage critically with the future choices about defence technologies and their governance that the EDF will bring.

Conclusion

Our contention is that from the 1970s onwards a particular view emerged of how the EU should support defence technology. The view is deeply rooted in the beliefs of that time that investment in defence technology drove civilian technological innovation and thus economic growth, and that the EU needed to bridge the transatlantic technological gap. Yet these dynamics are, in many ways, a story of the past. Many of the claims made for the US military technology achievements draw on evidence from the cold war era and may not be applicable elsewhere or indeed necessarily hold true for the USA of today (Mowery, 2009, 2012). Today, it is less common for defence technology to spin off into civilian innovation than for civilian technology to spin in for defence systems. As summarized by Maaïke Verbruggen, civilian and military 'business practices are out of sync, there are few social ties between the two worlds, innovative cultures do not translate, and many civilian engineers resist cooperation with the military' (Verbruggen, 2019 p. 338). This opens up an array of questions about the EDF's potential for innovation and how its funding should be targeted (see also Fiott, 2020).

Understanding how ideas about the future have created a stable sociotechnical imaginary of EU defence is relevant to comprehend the past and the present of key EU defence initiatives. We would take this argument further and claim that the EU's vision of its future sees technology and innovation performing central roles, as materialized in new 2020 documents such as the renewed EU cybersecurity strategy and the EU's strategy for digitalisation – and for this reason, the centrality of technology for security and defence matters opens up new avenues of research and invites insights from STS. From an STS perspective, visions of future developments in technology 'almost inevitably bring with them wider visions of social futures, of risk and benefit, and of the collective good' (Harvard STS, 2020) and are part of the logic of co-production of technology and socio-political order (Jasanoff, 2004). Research into the EU's tech-based political orders of the future would gain from critical engagements with the literature that puts the socio-politics of technology at the centre of the analysis.

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References

- Anderson, B. (1983) *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso Books).
- Ballo, I.F. (2015) 'Imagining Energy Futures: Sociotechnical Imaginaries of the Future Smart Grid in Norway'. *Energy Research & Social Science*, Vol. 9, pp. 9–20.
- Baumgartner, F.R. and Mahoney, C. (2008) 'The Two Faces of Framing: Individual-level Framing and Collective Issue Definition in the European Union'. *European Union Politics*, Vol. 9, No. 3, pp. 435–49.
- Bellanova, R. *et al.* (2020) 'Taking the Trouble: Science, Technology and Security Studies'. *Critical Studies on Security*, Vol. 8, No. 2, pp. 87–100.
- Berkhout, F. (2006) 'Normative Expectations in Systems Innovation'. *Technology Analysis & Strategic Management*, Vol. 18, No. 3–4, pp. 299–311.
- Bigo, D. and Jeandesboz, J. (2010) 'The EU and the European Security Industry Questioning the 'Public-private Dialogue'', INEX Policy Brief no. 5, February.
- Biscop, S. (2018) *European Strategy in the 21st Century: New Future for Old Power* (Abingdon: Routledge).
- Blauberger, M. and Weiss, M. (2013) 'If you can't beat me, join me!' How the Commission pushed and pulled member states into legislating defence procurement'. *Journal of European Public Policy*, Vol. 20, No. 8, pp. 1120–38.
- Boros, C. (2016) 'How the EU Cosied up to the Defence Lobby'. *EUObserver*, 20 December 2016. Available online at: <https://euobserver.com/investigations/136310>. Last accessed 25 March 2021.
- Borup, M., Brown, N., Konrad, K. and Van Lente, H. (2006) 'The Sociology of Expectations in Science and Technology'. *Technology Analysis & Strategic Management*, Vol. 18, No. 3–4, pp. 285–98.
- Breton, T. (2020) 'Conférence sur l'avenir de l'Europe: quelle ambition pour la défense européenne?' 4 November 2020. Available online at: https://ec.europa.eu/commission/commissioners/2019-2024/breton/annoncements/conference-sur-lavenir-de-leurope-quelle-ambition-pour-la-defense-europeenne-les-entretiens-de-la_en. Last accessed: 24 March 2021.
- Chong, D. and Druckman, J.N. (2007) 'Framing Theory'. *Annual Review of Political Science*, Vol. 10, pp. 103–26.
- Citi, M. (2014) 'Revisiting Creeping Competences in the EU: The Case of Security R&D policy'. *Journal of European Integration*, Vol. 36, No. 2, pp. 135–51.

- Council of the EU (2020) 'Council Conclusions on Security and Defence, 8910/20'. Brussels, 17 June. Available online at: <https://data.consilium.europa.eu/doc/document/ST-8910-2020-INIT/en/pdf>. Last accessed: 24 March 2021.
- Creasey, P. (1988) 'The Options and Prospects for Defence Procurement Collaboration'. In Creasey, P. and May, S. (eds) *The European Armaments Market and Procurement Cooperation* (Basingstoke: Macmillan), pp. 165–92.
- Daddow, O. (2004) *Britain and Europe since 1945: Historiographical Perspectives on Integration* (Manchester: Manchester University Press).
- Daviter, F. (2007) 'Policy Framing in the European Union'. *Journal of European Public Policy*, Vol. 14, No. 4, pp. 654–66.
- De defensa (2002) 'Le rapport Star 21. Un bon exemple et un exemple convaincant des ambiguïtés et des perversités de l'action européenne'. 18 July.
- Dewar, R. (2017) 'The European Union and Cybersecurity: A Historiographical Approach to an Emerging Actor's Response to a Global Security Concern'. In O'Neill, M. and Swinton, K. (eds) *Challenges and Critiques of the EU Internal Security Strategy: Rights, Power and Security* (Newcastle: Cambridge Scholars), pp. 113–40.
- Domecq, J. (2019) 'EU Strategic Autonomy is an Opportunity, Not a Threat'. *DefenseNews*, 2 December.
- Edler, J. and James, A.D. (2015) 'Understanding the Emergence of New Science and Technology Policies: Policy Entrepreneurship, Agenda Setting and the Development of the European Framework Programme'. *Research Policy*, Vol. 44, No. 6, pp. 1252–65.
- European Commission (EC) (2003) 'European Defence – Industrial and Market Issues – Towards an EU Defence Equipment Policy, COM (2003) 113'. Brussels, 11 March.
- EC (2004) 'Security Research: The Next Steps, COM (2004) 590 final'. Brussels, 7 September.
- EC (2020) 'A New Industrial Strategy for Europe, COM(2020) 102 final'. Brussels 10 March 2020. Available online at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2020%3A102%3AFIN>. Last accessed: 24 March 2021.
- EUISS (2016) *European Defence Research: The case for an EU-funded defence R&T programme. Report of the Group of Personalities on the Preparatory Action for CSDP-related research* (Paris: European Union Institute for Security Studies).
- European Communities (1976) 'Report by Mr Leo Tindemans, Prime Minister of Belgium, to the European Council'. Bulletin of the European Communities Supplement 1/76. Available online at: http://aei.pitt.edu/942/1/political_tindemans_report.pdf. Last accessed: 24 March 2021.
- European Parliament (EP) (2019) 'European Parliament Legislative Resolution of 18 April 2019 on the Proposal for a Regulation of the European Parliament and of the Council Establishing the European Defence Fund (COM(2018)0476 – C8–0268/2018–2018/0254[COD])'. Available online at: https://www.europarl.europa.eu/doceo/document/TA-8-2019-0430_EN.pdf. Last accessed: 24 March 2021.
- Evans, S.W., Leese, M. and Rychnovská, D. (2020) 'Science, Technology, Security: Towards Critical Collaboration'. *Social Studies of Science*. <https://doi.org/10.1177/0306312720953515>
- Ezrahi, Y. (1992) 'Technology and the Civil Epistemology of Democracy'. *Inquiry*, Vol. 35, No. 3–4, pp. 363–76.
- Ezrahi, Y. (2004) 'Science and the Political Imagination in Contemporary Democracies'. In Jasanoff, S. (ed.) *States of Knowledge: The Co-production of Science and Social Order* (Abingdon: Routledge), pp. 254–73.
- Fiott, D. (2018) 'Strategic Autonomy: Towards 'European Sovereignty' in Defence?' *Brief Issue 12* (Paris: EUISS).
- Fiott, D. (2020) 'Financing Rhetoric? The European Defence Fund and Dual-Use Technologies'. In Calcara, A., Csernaton, R. and Lavallée, C. (eds) *Emerging Security Technologies and EU Governance: Actors, Practices and Processes* (Oxon and New York: Routledge), pp. 42–57.

- Galbreath, D., Mawdsley, J. and Chappell, L. (eds) (2019) *Contemporary European Security* (Abingdon: Routledge).
- Goxho, D. (2019) 'European Defence Fund and European Drones: Mirroring US Practice?' *Global Affairs*, Vol. 5, No. 2, pp. 179–85.
- Group of Personalities (2004) *Research for a Secure Europe: Report of the Group of Personalities in the Field of Security Research* (Luxembourg: Official Publications of the European Communities).
- Guay, T.R. (1996) 'Integration and Europe's Defense Industry: A "Reactive Spillover" Approach'. *Policy Studies Journal*, Vol. 24, No. 3, pp. 404–19.
- Guay, T.R. (1997) 'The European Union, Expansion of Policymaking, and Defense Industrial Policy'. *Journal of European Public Policy*, Vol. 4, No. 3, pp. 404–21.
- Haroche, P. (2020) 'Supranationalism Strikes Back: A Neofunctionalist Account of the European Defence Fund'. *Journal of European Public Policy*, Vol. 27, No. 6, pp. 853–72.
- Harvard STS (2020) 'Sociotechnical Imaginaries, Harvard STS Programme'. Available online at: <http://sts.hks.harvard.edu/research/platforms/imaginaries/>. Last accessed: 24 March 2021.
- Hayward, K. (1997) 'Towards a European Weapons Procurement Process'. Chaillot Papers 27, Paris, Western European Union Institute for Security Studies.
- Hurlbut, B. (2015) 'Remembering the Future: Science, Law, and the Legacy of Asilomar'. In Jasanoff, S. and Kim, S.-H. (eds) *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power* (Chicago, IL: University of Chicago Press), pp. 126–51.
- James, A. (2018) 'Policy Entrepreneurship and Agenda Setting: Comparing and Contrasting the Origins of the European Research Programmes for Security and Defence'. In Karampekios, N. et al. (eds) *The Emergence of EU Defense Research Policy: From Innovation to Militarization* (Cham: Springer), pp. 15–43.
- Jasanoff, S. (ed.) (2004) *States of Knowledge: The Co-production of Science and Social Order* (Abingdon: Routledge).
- Jasanoff, S. (2015) 'Future Imperfect: Science, Technology, and the Imaginations of Modernity'. In Jasanoff, S. and Kim, H. (eds) *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication Of Power* (Chicago, IL: Chicago University Press), pp. 1–33.
- Jasanoff, S. and Kim, S.-H. (2009) 'Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea'. *Minerva*, Vol. 47, No. 2, pp. 119–46.
- Jeandesboz, J. and Ragazzi, F. (2010) 'Review of Security Measures in the Research Framework Programme, European Parliament, Brussels'. Available online at: <http://www.statewatch.org/news/2010/nov/ep-review-security-research-programme.pdf>. Last accessed: 24 March 2021.
- Jones, C. (2017) *Market Forces: The Development of the EU Security-industrial Complex*, TNI and Statewatch (Amsterdam: Transnational Institute).
- Konrad, K. and Böhle, K. (2019) 'Sociotechnical Futures and the Governance of Innovation Processes—An Introduction to the Special Issue'. *Futures*, Vol. 109, pp. 101–7.
- Lavallée, C. (2011) 'The European Commission's Position in the Field of Security and Defence: An Unconventional Actor at a Meeting Point'. *Perspectives on European Politics and Society*, Vol. 12, No. 4, pp. 371–89.
- Luukkonen, T. (2002) 'Technology and Market Orientation in Company Participation in the EU Framework Programme'. *Research Policy*, Vol. 31, No. 3, pp. 437–55.
- Marcum, J. (1986) 'The Technology Gap: Europe at a Crossroads'. *Issues in Science and Technology*, Vol. 2, No. 4, pp. 28–37.
- Martins, B.O. and Ahmad, N. (2020) 'The Security Politics of Innovation: Dual-use Technology in the EU's Security Research Programme'. In Calcara, A. et al. (eds) *The European Governance of Emerging Security Technologies* (Abingdon: Routledge), pp. 58–73.
- Martins, B.O. and Küsters, C. (2019) 'Hidden Security: EU Public Research Funds and the Development of European Drones'. *JCMS: Journal of Common Market Studies*, Vol. 57, No. 2, pp. 278–97.

- Mawdsley, J. (2003) 'The European Union and Defence Industrial Policy'. BICC Paper 31, Bonn.
- Mawdsley, J. (2018) 'The Emergence of the European Defence Research Programme'. In Karampekios, N., Oikonomou, I. and Caryannis, E.G. (eds) *The Emergence of EU Defence Research Policy: From Innovation to Militarization* (Cham: Springer), pp. 205–20.
- Merritt, G. (2004) 'Industrial Aspects of European Defence and Concrete Measures'. In von Wogau, K. (ed.) *The Path to European Defence* (Antwerp-Apeldoorn: Maklu), pp. 215–40.
- Michael, M. (2000) 'Futures of the Present: From Performativity to Prehension'. In Brown, N., Rappert, B. and Webster, A. (eds) *Contested Futures: A Sociology of Prospective Techno-Science* (Aldershot: Ashgate), pp. 21–39.
- Mörth, U. (2000) 'Competing Frames in the European Commission – The Case of the Defence Industry and Equipment Issue'. *Journal of European Public Policy*, Vol. 7, No. 2, pp. 173–89.
- Mörth, U. and Britz, M. (2004) 'European Integration as Organizing: The Case of Armaments'. *JCMS*, Vol. 42, No. 15, pp. 957–73.
- Mowery, D. (2009) 'National Security and National Innovation Systems'. *Journal of Technology Transfer*, Vol. 34, No. 5, pp. 455–73.
- Mowery, D. (2012) 'Defense-related R&D as a Model for "Grand Challenges" Technology Policies'. *Research Policy*, Vol. 41, No. 10, p. 170.
- Ruigrok, W. and van Tulder, R. (1995) *The Logic of International Restructuring: The Management of Dependencies in Rival Industrial Complexes* (Abingdon: Routledge).
- Rynning, S. (2020) 'National Expectations regarding the European Defence Fund: The Danish Perspective'. Available online at: <https://www.iris-france.org/wp-content/uploads/2020/05/ARES-49.pdf>. Last accessed: 24 March 2021.
- Salomon, J.-J. (1977) 'Science Policy Studies and the Development of Science Policy'. In Spiegel-Rosing, I. and de Solla Price, D. (eds) *Science, Technology and Society* (London: Sage), pp. 43–70.
- Sandholtz, W. (1992) *High-Tech Europe: The Politics of International Cooperation* (Berkeley: University of California Press).
- Schilde, K. (2017) *The Political Economy of European Security* (Cambridge: Cambridge University Press).
- Sclove, R. (1995) *Democracy and Technology* (New York: Guilford).
- Selin, C. (2008) 'The Sociology of the Future: Tracing Stories of Technology and Time'. *Social Compass*, Vol. 2, No. 6, pp. 1878–95.
- Servan-Schreiber, J.-J. (1968) *The American Challenge* (New York: Atheneum).
- Slijper, F. (2005) *The Emerging EU Military-industrial Complex. TNI Briefing Series 2005/1* (Amsterdam: Transnational Institute).
- Strikwerda, J. (2017) 'Sovereignty at Stake? The European Commission's Proposal for a Defence and Security Procurement'. *European Security*, Vol. 26, No. 1, pp. 19–36.
- Tardy, T. (2018) 'Does European Defence Really Matter? Fortunes and Misfortunes of the Common Security and Defence Policy'. *European Security*, Vol. 27, No. 2, pp. 119–37.
- Taylor, T. (1997) 'Arms Procurement'. In Howorth, J. and Menon, A. (eds) *The European Union and National Defence Policy* (Abingdon: Routledge), pp. 121–40.
- Verbruggen, M. (2019) 'The Role of Civilian Innovation in the Development of Lethal Autonomous Weapon Systems'. *Global Policy*, Vol. 10, No. 3, pp. 338–42.
- Von Wogau, K. (2004) 'The Defence of Europe: A Political Imperative'. In von Wogau, K. (ed.) *The Path to European Defence* (Antwerp-Apeldoorn: Maklu), pp. 13–26.
- Vranken, B. (2017) *Securing Profits: How the Arms Lobby Is Hijacking Europe's Defence Policy* (Vredesactie: Brussels) Available online at: https://www.vredesactie.be/sites/default/files/pdf/Securing_profits_web.pdf. Last accessed: 24 March 2021.