



R4.2 ANNEX 1 - Contribution of ASSETs+ to the European Defence Skills Strategy 2020-2024, the Pact for Skills and the Action Plan on Synergies between Civil, Defence and Space Industries

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Introduction

The defence sector is historically an innovation intensive sector. In the last decade or two, this intensity has been pushed by different disruptive technologies such as Artificial Intelligence (AI), Robotics and Internet of things. The strong evolution of these technologies, connected with the trending under-interest of young workers with respect to the defence sector, is creating a significant shortage of skills to cope with these technological evolutions. Thus, there is the need to focus on making the defence sector more dynamic, to foster the development of specific technical and transversal skills on future and current workforce to cope with the constant technological evolution and to develop a strategic foresight for future skills to understand how education and training can cater to industry's needs for qualified human resources.

The ASSETS+ project aims at creating a strategy to attract new talent to the Defence sector and to reskill and upskill professionals, which include the design and development of training programmes aligned with real industrial needs and based on the identification of Defence industry skills needs and on standardization of the priority job profiles related to the emerging technologies identified in the project. This strategy for developing human resources (HR) for defence is part of ASSETS+ sector Skills Strategy, aiming at building a sustainable qualified human resources supply, providing companies working in Defence access to qualified professionals that will help them to overcome the challenges imposed by technological evolution and demanding socio-economic contexts as the ones Member States and industrial ecosystems across Europe are currently facing.

ASSETS+ will develop training programmes to be part of a European Defence Qualification System (aimed at students from Vocational Education and Training (VET), graduate and undergraduate students from Higher Education (HE) and professionals looking to up/reskill) will be developed based on the results from the analysis conducted under ASSETS+ Work Package 1 (WP1 - Technology and Skill Analysis), validated by key stakeholders from Industry to ensure their alignment with the most recent Defence sector developments.

The work carried out in WP1 is divided in three macro technological areas, each one analysed by a part of its team:

- **Robotics, Artificial Intelligence (AI) and Autonomous-Systems**, addressed by Aalborg University and Rzeszów University of Technology;
- **C4ISTAR**, addressed by Bordeaux University and Pisa University;
- **Cybersecurity**, addressed by Carlos III University and Seville University.





ASSETs+ strategy for Skills for Defence will build on the EDSP strategy (European Defence Skills Strategy 2020-2024), which is a set of supporting actions and implementing activities that are aligned with specific objectives that reply to identified key defence gap drivers related to demographic challenges, skills mismatches and low defence investment, to name a few, to match demand and supply of skills. Moreover, it will be built upon specific ASSETs+ results:

- a. Defence Technology Roadmap (R1.2), which focuses on identifying, scoring and categorizing relevant technologies, on identifying potential application domains and mapping the technologies to those applications.
- b. Skill Blueprint (R1.3), which identifies technical, defence-related and transversal skills for the three domains addressed by ASSETs+ project, classifying them based on qualitative and quantitative measures related to degrees of specialization and knowledge and demand from the labour market.
- c. Fiches (R1.6), which identifies a series of policies, projects and best practices carried out at regional, national and European levels that can be an added value for the development of skills for the defence industry.

There are specific tasks related to the above-mentioned ASSETs+ results: task T1.2 “Technology Mapping” is to map technologies relevant to Defence applications, the task T1.3 “Emerging skills related to selected techs” aims at understanding the skills demand in the Defence sector related to the selected technologies to help design new educational and training programmes. The objective of the task T1.6 “Fiches” is to present the existing and planned EU, national, regional, and industry-led policies, and other programmes and initiatives aimed at the sustainment and development of Defence-related skills.

The results of these tasks will be the foundation of the design of the education and training programmes for the Defence sector. They will thus be integrated with other ASSETs+ Work Packages’ results as part of the strategic plan addressed by this document, that seeks to identify and fill the skill gaps for Defence by developing new skills in Robotics, Artificial Intelligence, Autonomous Systems, and C4ISTAR and Cybersecurity for the defence towards a sustainable human resource supply for the sector.

This document is the first approach to ASSETs+ Skills Strategy for defence as it identifies the main gap drivers faced by the sector (and described by the EDSP strategy) and proposes actions to be developed in the scope of the project that contribute to addressing those gaps. Moreover, due to the relevant role of the Pact for Skills for the recovery of the defence ecosystem, it is also considered for the roll-out of the Skills Strategy for defence.





It also relies on collaboration amongst relevant stakeholders from industry and education to carry out specific actions to tackle skills mismatches and other challenges faced by the sector. Therefore, this document identifies the principles addressed by the Pact for Skills and how ASSETs+ connects to them. Finally, this document also provides an overview of the activities and actions to be developed in the project during its implementation period, which will contribute for the Skills Strategy for defence to be developed within ASSETs+. It will be periodically revised to be updated in line with the most recent developments in the defence sector in terms of skills needs and technological trends, identified by ASSETs+ results in WP1.





Contribution to the European Defence Skills Strategy 2020-2024

Since 2013, the European Commission has been encouraging the defence industry and its stakeholders to use various existing EU programmes and tools in addressing the skill needs of the industry.¹ In 2018, the study commissioned by the EC developed an overview of the existing and future defence-skills landscape in the EU, identified and analyzed the skills gaps, and delivered a mapping of initiatives to address the skills gaps.² Based on the evidence gathered during this study, the European Defence Skills Strategy 2020-2024³ was developed.

The ASSETS+ project has reviewed the drivers of skills gaps identified the European Defence Skills Strategy 2020-2024 and proposed actions that contribute to addressing certain gaps.

The European Defence Skills Strategy 2020-2024 has identified the following five gap drivers of skills in defence sector:

- 1) Demographic challenges and limited strategic focus on skills;
- 2) Mismatch between employer needs and educational/training input;
- 3) Negative perception of the defence industry as an employer;
- 4) Stiff competition for skilled workers from non-defence sectors;
- 5) Insufficient demand for skills utilization due to low defence investment.

Towards tackling the identified gap drivers, the strategy proposes five key objectives and a set of supporting actions and activities addressing the skilling and up/re-skilling needs of the Defence sector.

Table 2 describes the five gap drivers and provides how ASSETS+ will support tackling the given gap.

¹ https://ec.europa.eu/growth/sectors/defence/skills_en

² https://eudsp.eu/event_images/Downloads/1%20Main%20report_1.pdf

³ https://eudsp.eu/event_images/Downloads/European%20Defence%20Skills%20Strategy_2020-2024.pdf





Table 1 Gap Drivers and ASSETs+ Actions

GAP DRIVERS	ASSETs+ ACTIONS
Demographic challenges and limited strategic focus on skills	<u>Overall project:</u> ASSETs+ is developing and implementing a skills strategy specifically on emerging technologies for the Defence sector to reinforce the strategic focus in future policies. The involvement of Academic and Industrial partners from different EU's states can strength the collaboration at European level, allowing the exchange and the contamination of research and development programmes and keeping the focus on the needs in Defence sector. The project addresses this gap launching the Pact for Skills (that is also one of the implementing activities planned in the European Defence Skills Strategy) and promoting the mobility among the different countries by designing educational courses open to students and workers all across Europe. ----- <u>Activities:</u> The task T1.1 "Strategy specification" proposes a strategic vision for upskilling and reskilling workers to make them suitable for the Defence sector. This strategy will be proposed by academic partners and validated by industrial members of the ASSETs+ consortium. The aim of this task is to deliver an agile methodological approach that rely both on AI and human expertise to map the complex technological environment and formalize the skills needs related to Defence. The task T2.2 "Guidelines for designing Defence Sector Professional Standards and European Defence Sector matrix for Learning Outcomes" proposes a modular design approach that takes into consideration that different EU countries may have different standards for education. The task T2.5 "Design the Education&Training programme prototype for University undergraduates (EQF level 6)" creates opportunity for industry to be involved at an early stage in the design of programmes in general, and upskilling programmes in particular, so that the Academic institutions can properly address the strategic skills required in the Defence sector. The task T3.7 "Execution of Edu & Training programme in other context" will improve awareness of Defence related skills significance for industry as well as the strategic significance of the skills. It should contribute





GAP DRIVERS	ASSETS+ ACTIONS
	to ensure the implementation and exploitation of the training programmes at a wider scale than the ASSETS+ consortium. This should help also reduce the gap between employer needs and educational proposals in Europe. It will result in increasing number of skilled workers whose skills concerning dual use technologies can be used in both, Defence and non-Defence sectors. Moreover, in the educational programs execution positive perception of the defence industry is strengthened and educational programs execution in other contexts. The task T3.9 “Final programmes review, improvement and release” should assess whether training programmes met demographic challenges, should help propose training programmes matching industry partners’ needs and should assess whether the programmes include elements counteracting employees’ negative perception of the Defence industry.
Mismatch between employer needs and educational/training input	<u>Overall project:</u> ASSETS+ promotes ASSOCIATE STAKEHOLDERS INITIATIVE, CO-ORGANISATION OF EVENTS WITH EDSP involving external Industry/stakeholder, therefore it will strengthen coordination between government, industry and education & training. It will facilitate continued collaboration at European level to attain sustainable solutions for common needs and learn from each other. Moreover, implementing this activity, the project contributes to expanding and upgrading the existing ecosystem (EDSP) to accelerate knowledge transfer, allow proactive communication of the sector's needs and faster response through large- scale industry-led partnerships (Pact for Skills). The EDSP events create opportunities of discussions and exchanges between academics and industrials is always useful to reduce these gaps 2 and 3. ----- <u>Activities:</u> WP2 SEMINARS, SPRINTS EVENTS: DEFENCE STUDENTS CHALLENGE: It is a contest about courses with Problem Based learning and project-based learning using cases from Aerospace and Defence sector/companies. It contributes in strengthen coordination between government, industry and education & training. It facilitates continued collaboration at European level to attain sustainable solutions for common needs and learn from each other. The implementing of this activity engages industry, academia and authorities in projects for collaborative building of trainings.





GAP DRIVERS	ASSETs+ ACTIONS
	The task T1.2 “Technology mapping” improves internal communication between WPs to ensure that the topics defined in WP1 can be easily mapped to programmes and EQF levels. It contributes to reinforcing communication between industrial partners (potential future employer) and academics (programme designers). The task T1.3 “Emerging skills related to selected techs” identifies the skills that are required for workers in the Defence sector in relation to the emerging technologies analysed in the task T1.2 “Technology mapping”. This is indeed valuable to build skills mapping and anticipation tools, as it points out relevant skills that must be developed by future candidates. It considers the expected input to WP2 for each EQF level when designing the skills blueprint. The task T2.1 “Design of the pedagogical approach and detailed sub approaches” address this gap since it uses the results from WP1 to design the training courses for workers in the Defence sector. The task T2.2 “Guidelines for designing Defence Sector Professional Standards and European Defence Sector matrix for Learning Outcomes” takes into consideration the industry needs when developing the qualifications and competence units for the Defence sector. The task T2.3 “Design of Education & Training Programme Prototype for VET (EQF Level4 and Level5)” fosters cooperation between industrial partners and vet providers at the beginning of the programme design. It identifies Industrial needs and expectations concerning EQF level 4 and 5 (in vocational training, but also upskilling and reskilling) as well as the added value of defence skills and value them. The task T2.4 “Design of Education & Training Programme Prototype for University undergraduates (EQF Level 6)” creates synergies between industrial partners and academics since the beginning of the design. In fact, it allows to exchange with them about their needs and expectations concerning each EQF level, creating more opportunities to present the defence industry, and it ensures the inclusion in the educational program of elements that could strengthen a positive perception of the defense industry. The task T2.5 “Design of Education & Training Programme Prototype University graduates (EQF Level 7)” creates opportunity for industry to be involved at an early stage in the design of programmes in general, and upskilling programmes in particular.





GAP DRIVERS	ASSETS+ ACTIONS
	The task T3.2 “Edu & Training programmes prototyped (restricted) pilots” allows developing more synergies between industrial partners and academics always helps reduce the mismatch between employer needs and educational programmes. The feedbacks from the students and trainers should help adjust the prototyped programmes. The later can be useful to improve gaps 2 and 3. With the tasks T3.2 “Edu & Training programmes prototyped (restricted) pilots”, T3.7 “Execution of Edu & Training programmes in other contexts” and T8.4 “Education and training programmes prototypes evaluation” ASSETS+ will implement and execute a series of reskilling/upskilling courses for Defence-related technologies including robotics/AI, C4ISTAR and cybersecurity. These courses will be developed by academic partners and validated by industrial members of the consortium. The task T3.3 “Internal evaluation on the 3 Education & Training programmes prototyped” will be useful as this will a new opportunity for academics and industrials to exchange. Feedbacks should help reduce the mismatch between employer needs and educational input. The task T3.4 “Programme review, improvement & release” will be an opportunity for the academics to take into account the various returns from the industrial partners and the students to provide training programmes that meet the expectations. The task T3.6 “Design and Implementation of Training the Trainers” can contribute to ensure the implementation and exploitation of the training programmes at a wider scale than the ASSETS+ consortium. This should help reduce the gap between employer needs and educational proposals in Europe. Moreover, ASSETS+ will include a "Train the trainers" activity so that future teachers will be teaching in an effective way. Remarkably, this task is carried out by academic members and reviewed by industrial partners. Therefore, this will contribute to reduce mismatches between talent leaving education and entering the Defence sector. The task T3.7 “Execution of Edu & Training programmes in other contexts” will improve awareness of defence related skills significance for industry as well as the strategic significance of the skills. Executing the training programmes in other contexts should contribute to ensure the implementation and exploitation of the training programmes at a wider scale than the ASSETS+ consortium. This should help reduce the gap between employer needs and educational proposals in Europe. In the educational programs execution





GAP DRIVERS	ASSETS+ ACTIONS
	positive perception of the defence industry is strengthened. Educational programs execution in other contexts will result in increasing number of skilled workers whose skills concerning dual use technologies can be used in both, defence and non-defence sectors." The task T3.8 "Internal evaluation of implemented Edu & Training programmes" involving industry partners should be a new opportunity for discussions between academics and industry partners. The task T3.9 "Final programmes review, improvement and release" assess whether training programmes met demographic challenges. Final programmes review should help propose training programmes matching industry partners needs and it should assess whether the programmes include elements counteracting employees' negative perception of the defence industry. The task T4.1 "Setting up of the Observatory" is oriented to setting up the Defence Observatory, which will be used as coordination tool among the strategies (tech roadmap and skill blueprint), the activities (WP 2-3 results) and the opportunities (other initiatives, projects, founds, legislation, etc.). The Observatory will play a key role in the sustainability of the ASSETS+ project results, thus improving the perception of Defence and a continuous supply of skills. It is thus an important mechanism or institutional arrangement for focusing attention on a particular set of skills and related issues.
Negative perception of the Defence industry as an employer	<u>Overall project:</u> ASSETS+ organizing the EDSP events create opportunities of discussions and exchanges between academics and industrials is always useful to reduce this gap. Furthermore, a part of ASSETS+ active members are Ph.D. students and young researchers. This can help to better communicate the characteristics of the defence sector in a peer-to-peer way, lowering the barrier at the entrance for students. ----- <u>Activities:</u> WP2 SEMINARS, SPRINTS EVENTS: DEFENCE STUDENTS CHALLENGE: an opportunity to create more synergies between industrial partners and academics as well as to present a new image of the defence industry.





GAP DRIVERS	ASSETS+ ACTIONS
	The task T1.3 “Emerging skills related to selected techs” identifies a list of Defence-related applications and job profiles. This can be useful for dissemination to attract future candidates among current University students. The task T2.3 “Design of Education & Training Programme Prototype for VET (EQF Level4 and Level5)” fosters cooperation between industrial partners and vet providers at the beginning of the programme design. It allows identifying Industrial needs and expectations concerning EQF level 4 and 5 (in vocational training, but also upskilling and reskilling) as well as the added value of defence skills and value them. The task T2.4 “Design of Education & Training Programme Prototype for University undergraduates (EQF Level 6)” creates synergies between industrial partners and academics since the beginning of the design. It allows exchanging with them about their needs and expectations concerning each EQF level, creating more opportunities to present the defence industry. It aims at the inclusion in the educational program of elements that could strengthen a positive perception of the defense industry. The task T3.2 “Edu & Training programmes prototyped (restricted) pilots” allows developing more synergies between industrial partners and academics always helps reduce the mismatch between employer needs and educational programmes. The feedbacks from the students and trainers should help adjust the prototyped programmes. The later can be useful to improve gaps 2 and 3. The task T3.7 “Execution of Edu & Training programmes in other contexts” allows the application of the programs in other contexts will improve awareness of defence related skills significance for industry as well as the strategic significance of the skills. Executing the training programmes in other contexts should contribute to ensure the implementation and exploitation of the training programmes at a wider scale than the ASSETS+ consortium. This should help reduce the gap between employer needs and educational proposals in Europe. In the educational programs execution positive perception of the defence industry is strengthened. Educational programs execution in other contexts will result in increasing number of skilled workers whose skills concerning dual use technologies can be used in both, defence and non-defence sectors. The task T3.9 “Final programmes review, improvement and release” should assess whether training programmes met demographic challenges; it should help propose training programmes matching industry partners’ needs; final review should assess whether the programmes include elements counteracting employees' negative perception of the defence industry.





GAP DRIVERS	ASSETS+ ACTIONS
	The task T5.6 “European Final conference” will disseminate lessons learned throughout the project, including ideas on how to attract talent to the Defence sector. The work package WP5 “DISSEMINATION AND COMMUNICATION” will create a series of videos to raise the interest of future students to the Defence sector, highlighting the three main technological areas addressed in the project: robotics/AI, C4ISTAR and cybersecurity. It will organise the Students challenge to foster the interest of current University students into Defence-related topics.
Stiff competition for skilled workers from non-defence sector	<u>Overall project:</u> ASSETS+ med-long term goals within the Pact for Skills will tackle this issues: - Defining a common skill framework for standardized taxonomy: - KPI: establishment of one Sectoral Qualifications Framework for Aerospace and Defence - KPI: referencing of the Sectoral Qualifications Framework for Aerospace and Defence to the EQF and NQFs - KPI: number of sectoral qualifications for Aerospace and Defence defined in terms of Learning Outcomes - KPI: number of new ESCO profiles related to the Defence Sector - Propose qualification schemes: - KPI: n. of new Micro-credentials for Aerospace and Defence (MADs) awarded by formal providers (HEIs) - KPI: n. of new MADs awarded by non-formal providers (industry...) - KPI: n. of learners earning MADs (formal and non-formal providers) - KPI: % of yearly increase rate of learners earning MADs (formal and non-formal providers) - KPI: n. of new academic programmes expressing workload according to ECTS System - KPI n. of digital credentials (i.e. qualifications awarded in digital format, e.g. in blockchain) - Grants and funding to support these across different EU countries: - KPI: n. of Joint Degree Programmes in the sector of Aerospace and Defence - KPI: n. of Joint courses in the sector of Aerospace and Defence (e.g. summer schools, ...)





GAP DRIVERS	ASSETS+ ACTIONS
	- KPI: n. of learners enrolled in joint programmes and joint courses - KPI: n. of scholarships provided to learners enrolled in joint programmes and joint courses - KPI: establishment of one European University in Aerospace and Defence ASSETS+ project will support the strategic action 3 "Contribute towards recognition of certification and a standardised EU-level accreditation system for training and education institutions" and the action 3 "Map existing qualifications and link with EU frameworks". ----- <u>Activities:</u> The task T1.5 "Skills2ESCO" aims to enrich ESCO with the identified skills in the task T1.2. and T1.3 (respectively "Technology mapping" and "Emerging skills related to selected techs"). This may help for future certifications of courses leveraging ESCO skillset. The tasks T3.2 "Edu & Training programmes prototyped (restricted) pilots", T3.7 "Execution of Edu & Training programmes in other contexts" and T8.4 "Education and training programmes prototypes evaluation" will implement and execute a series of reskilling/upskilling courses for Defence-related technologies including robotics/AI, C4ISTAR and cybersecurity. These courses will be developed by academic partners and validated by industrial members of the consortium. The task T3.7 "Execution of Edu & Training programmes in other contexts" will improve awareness of defence related skills significance for industry as well as the strategic significance of the skills. Executing the training programmes in other contexts should contribute to ensure the implementation and exploitation of the training programmes at a wider scale than the ASSETS+ consortium. This should help reduce the gap between employer needs and educational proposals in Europe. In the educational programs execution positive perception of the defence industry is strengthened. Educational programs execution in other contexts will result in increasing number of skilled workers whose skills concerning dual use technologies can be used in both, defence and non-defence sectors. The task T4.3 "Plan for a European Defence Sector Qualification System for HE and VET" is oriented to create the baseline for the European





GAP DRIVERS	ASSETs+ ACTIONS
	Defence Sector Qualification System, containing a series of Operational Procedures and Rules on how to implement a quality management system with the purpose of assuring the harmonisation of the qualification system. Furthermore T2.2 "Guidelines for designing Defence Sector Professional Standards and European Defence Sector matrix for Learning Outcomes" will support the development of the training programmes based on a modular approach, which will facilitate the mobility and transferability of skills. The task T6.4 "Recognition and certification of Education and Training Qualification" will focus on the recognition and certification of education and training qualification. Thus, it will be useful for the accreditation of training and education institutions as well.
Insufficient demand for skills utilization due to low defence investment	<u>Overall project:</u> ASSETs+ courses will help companies in understanding the value of new technologies that are impacting the defence sector. This will increase the awareness of companies' leaders on the potential of these technologies for the sector, possibly giving the chance to invest more in this direction. The change will also be bottom-up. The fact that employees will also participate in ASSETs+, will increase the chances to bring innovation in the defence companies directly from the workers. This will impact the amount of money that companies will invest in new technologies, since the economical barrier for adopting these technologies will be lower, considering the fact that they will not need to invest in the education of the workers. ----- <u>Activities:</u> The T1.6 "Fiches" maps the European, National, Regional and industry-led initiatives which can have value for defence industry in skills development: • Policies to show development directions, • European, national and regional projects to show initiatives undertaken in the areas of Robotics, autonomous systems, artificial intelligence, C4ISTAR and Cybersecurity, • Conferences to indicate the possibilities of sharing and gaining knowledge connected with the analysed areas, • University courses, Postgraduate studies, Trainings to present the possibilities of knowledge upgrading, • Journals to show the sources of knowledge connected with the analysed areas. Understanding which are the current policies and programmes can help in identify existing funding opportunities, tools and mechanisms on which it is possible to leverage to address defence skills needs.





GAP DRIVERS	ASSETS+ ACTIONS
	The dissemination and the communication of the results, addressed in WP5, will raise the awareness of the public regarding the Defence sector. Among the goals of the dissemination action plan there are the communication with related, EU-funded projects and initiatives especially in the field of defence and skills-transfer at different geographical levels, and the support of policy making by actively contributing and tailoring the results to the needs of ongoing policy initiatives particularly at EU level. These goals are in lines with the key actions of the European Defence Skills Strategy (i.e., “map and promote EU funding relevant for defence skills to create a one-stop-shop at EU level regrouping relevant funding” and “organise events to clarify applying procedures, provide guidance, and facilitate consortia building). The exploitation addressed in WP4 will ensure the sustainability of the project results and products and its transferability in each partner country as well as across the EU countries. Some of the goals in this work package are: • Ensure transferability of the ASSETS+ products in each partner country (in close coordination with WP2-3). • Encourage stakeholders to use the project outcomes at local, regional and national level in each partner country (in close coordination with WP5). Influence the mainstreaming, sustainability and further develop project results, involving stakeholders, policymakers and decision-makers. Therefore, the activities related to this work package will address this gap ensuring calls for defence specific activities.





ASSETS+ and the Pact for Skills

Managed by the European Commission, the Pact for Skills⁴ is one of the actions under the European Skills Agenda 2020. It is a new engagement model and approach to skills that aims to mobilize and incentivize relevant stakeholders from all sectors (Education and Training Providers, Industry representatives from public and private sectors, social partners, amongst others), to commit and work together in partnerships towards the implementation of a strategy that replies to its main priority: upskilling and reskilling the EU workforce in the period between 2021-2027 to cope with the challenges brought to economy and Industry by the global pandemic and climate and digital transitions. These partnerships can have a large-scale dimension (by involving major players in Industrial Ecosystems, public authorities or by addressing concrete investments in upskilling opportunities for employees in companies or whole supply chains) or have national, regional or local dimensions (by involving employers, public authorities, stakeholders from VET, Public Employment Services or social partners and sector or regional entities focused on upskilling). Social partners' arrangements and individual commitment are also taken into account under the Pact for Skills.

The engagement of all these entities/stakeholders with each other and with the Pact for Skills is rooted on a Charter signed by all entities involved, addressing a set of principles focused on the quality of commitments for upskilling and reskilling:

- Building strong skills partnerships with relevant stakeholders;
- Promoting a culture of lifelong learning for all;
- Monitoring skills supply/demand and anticipating skills needs;
- Working against discrimination and for all gender equality and equal opportunities.

These principles have to be translated into concrete actions with Key Performance Indicators (KPIs) measuring the achievement of the objectives of the Pact for Skills. These KPIs include for example the number of people taking part of the upskilling and reskilling activities.

By addressing upskilling and reskilling, the Pact for Skills is also addressing the lifelong learning approach, which includes "all learning activity undertaken throughout life, resulting on the improvement of knowledge, know-how, skills, competences and/or qualifications for personal, social and/or professional reasons" (Cedefop, 2014)⁵.

The importance given to these matters relies on their positive impact on the recovery of the 14 industrial ecosystems identified by the EC, in which the Pact for Skills is focused, illustrated by the figure below.

⁴ Source <https://ec.europa.eu/social/main.jsp?catId=1517&langId=en>

⁵ Cedefop (2014). *Terminology of European education and training policy – second edition – A selection of 130 key terms*. Luxembourg: Publications Office of the European Union



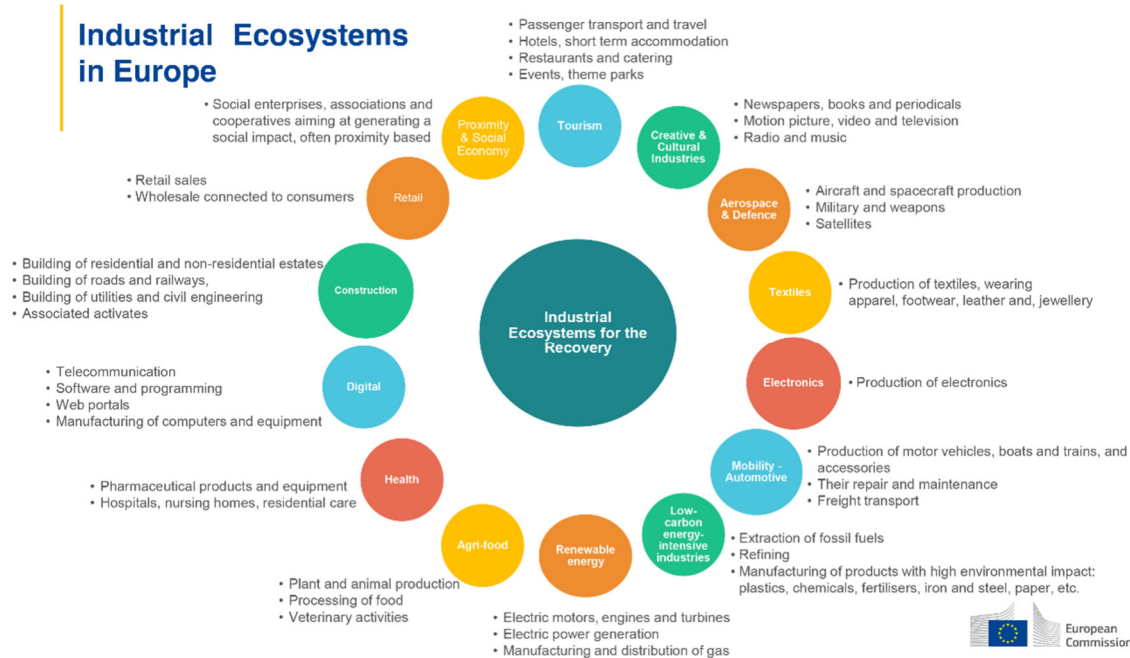


Figure 1 Industrial Ecosystems identified by the EC and addressed by the Pact for Skills towards their recovery⁶

The Aerospace and Defence is among them and is focused on Aircraft production, space manufacturing and services and Defence products and technologies. The Pact for Skills opens way for ASSETs+ project to provide significant inputs such as (among others), develop technology and skills mapping to enrich the skills intelligence for the defence sector, share best practices and develop new skilling and up/re-skilling incentives for the defence sector and widen the outreach and contribute to building a strong defence skills ecosystem.

The Pact for Skills strengthens the ambition of the ASSETs+ project to build a strategy for the development of HR in the defence sector entailing a tested methodology for building technology and skills intelligence for the defence sector. ASSETs+ project proposes a set of actions that will support the Pact for Skills and will maximise its impact.

The Table 2 below details the connection between the Pact for Skills principles and ASSETs+ activities that address them.

In sum, as occurs with the key gap drivers faced by defence sector identified by the EDSP strategy, also the Pact for Skills is addressed by ASSETs+ project and its activities, thus replying to real defence industry needs and major socio-economic challenges by fostering the sector's attractiveness to young people, reskilling and upskilling of the workforce and, ultimately, its recovery at European level.

⁶ Source https://www.cencenelec.eu/news/policy_opinions/PolicyOpinions/CEN-CENELEC_contributions_AUWP_Ecoysystems.pdf





Table 2 Connection between ASSETS+ and Pact for Skills principles

Pact for Skills Principles	ASSETS+
Building strong skills partnerships with relevant stakeholders	The project promotes the collaboration between both Education and Industry sectors by bringing together Vocational Education and Training (VET), Higher Education (HE) providers, industry and other stakeholders and ensuring their engagement towards building skills for the defence sector. The ASSETS+ partnerships consist of 30 partners who collaborate closely to develop strategic skills addressing emerging technologies in defence. The project offers a structure to building a sustainable defence skills ecosystem by developing and implementing new education and training initiatives which would be first piloted and implemented in partner countries and then rolled out in other countries (and regions).
Promoting a culture of lifelong learning for all	ASSETS+ fosters a lifelong learning approach through the design and development of Education and Training Programmes addressing different qualification levels (EQF level 4 to EWF level 6) for upskilling and reskilling VET, undergraduate and graduate students and professionals. These Programmes, designed and developed in the scope of ASSETS+ Work Package (WP) 2 - Education and Training Design, focus on specific skills needs of the Defence industry related to the job profiles identified as priority in the scope of WP1 - Technology and Skills Analysis, within specific technological domains (Cybersecurity, Artificial Intelligence, C4ISTAR and autonomous systems) and their respective application (also identified under WP1, more specifically on <i>R1.2 Technologies Roadmap</i> and <i>R1.3 Skills Blueprint</i>). By developing new occupational profiles for the defence sector, the project will contribute to building a comprehensive European defence skills ecosystem. In response to COVID-19, a need to invest in learning access for all ages has increased also in defence sector. This entails a need to develop modular, easier to access and online training offer and thus also new pedagogical approaches. The project will address this when building new training programmes and supporting methodological tools.
Monitoring skills supply/demand and anticipating skills needs	The project contributes to developing skills intelligence for the defence sector. The skills methodology developed combines traditional tools with big data analysis (e.g., technology and skills mapping) and supports the collaboration and understanding between the education and training providers and the industry.





Pact for Skills Principles	ASSETs+
	The development of the European Defence Observatory in ASSETs+ will ensure continuity in systematic gathering and analysis of data related to the skills needs and gaps of the defence sector (the main focus of the project's sector Skills Strategy), and technological trends, whilst interacting with relevant stakeholders from Industry and Education (internal and external to the project) with the required expertise for validating the collected data. It will support the implementation of European Qualification System for Defence Sector, rooted on a strong Quality Assurance System (valued by industry), which will be comprised by the education and training programmes designed and developed in ASSETs+ with inputs from the above-mentioned data. Moreover, as one of the main results of ASSETs+, the Body of Knowledge (BoK) will map and provide detailed information on the relevant skills needed for defence practitioners with respect to the technological scope of the project as an additional basis for the development of ASSETs+ education and training programmes.
Working against discrimination and for all gender equality and equal opportunities	Defence is known to be male-dominated and in need for a more inclusive language and terminology. The project contributes to raising the attractiveness of the defence by promoting it as an innovative and inclusive sector, able to offer interesting, future looking and equal opportunities. ASSETs+ dissemination and activities such as the education & training programmes to be developed in the project (which will take these issues in consideration) and the European Defence Challenge (aimed at the participation of students from all genders and socio-economic backgrounds), have the purpose to maximise its societal benefits by increasing public awareness on various issues connected to gender balance in defence.





Alignment between ASSETs+ and the Action Plan on Synergies between Civil, Defence and Space Industries

The “Action Plan on Synergies between Civil, Defence and Space Industries” is a European plan to enhance Europe’s technological edge and support its industrial base. It aims at enhancing complementarity between EU programmes and instruments (Synergies); promoting the results of defence and space research and development (R&D) for civilian innovations (Spin-offs); and facilitating the use of civil industry research and innovation in defence projects (Spin-ins). An overview of the content is given in the following wordcloud, where the most recurrent words and expression are reported. The technologies push research and development in the sectors of defence, space, security and civil, which are strongly entangles, as demonstrated by frequent expressions such as the pair civil-defence and the cross-fertilization of the sectors. The main enablers are European programmes on critical and disruptive technologies as well as critical raw materials, following a capability driven approach and involving not only the main actors of European defence and space industry, but also the start ups, in the view of European sovereignty.



Figure 2 - Most recurrent terms and expressions in the Action Plan on Synergies between Civil, Defence and Space Industries.





In details, it includes the following eleven actions, for each a short description is provided in the following table.

N	Action	Description
1	Foster capability driven approaches across security sectors	Strengthen security research and innovation and set up a shared management, leveraging on cross-fertilisation and synergies between civil, defence and space industries.
2	Promote synergies and coordinate EU programs and instruments	Scale up investment on dual-use provisions, leveraging on cross-fertilisation and synergies between civil, defence and space industries.
3	Raise awareness about EU funding programs for start-ups, SMEs and RTOs in defence, security, space and relevant civil markets	Be aware of potential business opportunities and calls launched under EU programs, leveraging on cross-fertilisation and synergies between civil, defence and space industries.
4	Develop roadmaps to boost innovation on critical techs	Develop roadmaps on critical techs and potential applications to achieve technological sovereignty and launch flagship projects, leveraging on cross-fertilisation and synergies between civil, defence and space industries.
5	Promote hybrid civil/defence standards	Improve efficiency, effectiveness and comprehensibility, leveraging on cross-fertilisation and synergies between civil, defence and space industries.
6	Launch an innovation incubator hub to support dual-use innovations	Boost innovation and create breakthrough techs, leveraging on cross-fertilisation and synergies between civil, defence and space industries.
7	Set up the Cybersecurity Competence Centre	
8	Fund programs for disruptive technologies	
	Launch flagship projects on:	Identify critical technologies and promote projects on them leveraging on cross-fertilisation and synergies between civil, defence and space industries.
9	EU drone technologies	
10	EU space-based global secure communication systems	
11	Space Traffic Management	

The alignment of the ASSETS+ project to the above-described plan is evident first in the intent of leveraging on **cross-fertilisation** and **synergies**, indeed the ASSETS+ Consortium put together various stakeholders of the sector to properly address the posed challenges.





ASSETs+ project explores the emerging trends in technologies and skills within Defence sector, using a capability driven approach, as indicated in the Action Plan on Synergies between Civil, Defence and Space Industries. Those are reported in roadmaps to support new education and training programmes for each of the EQF levels (4-5 / 6 / 7) within a European Defence Qualification system, ensuring that the educational programs comply with pedagogical requirements and match industrial needs. Therefore, the approach and the results are aligned within the scope of the actions 1-4.

The need of homogeneous architecture supporting the physical and intangible capabilities (respectively technologies and human resources) is an important element for the ASSETs+ project, which educational programs and activities aims at structure a Qualification systems and promote the best practices in the sector to share knowledge and activate standardizations procedures, as planned in the actions 5.

The technological domains in the scope of ASSETs+ as well as the purpose of developing training courses is aligned with the rest of the actions (6-11).

The Action Plan on Synergies between Civil, Defence and Space Industries will be therefore a guidelines for framing the concrete actions and recommendations of the R4.2 **Strategy for developing HR in the Defence sector.**





Conclusions

ASSETs+ project aspires to build a sustainable human resources supply chain which allows Defence sector companies in recruiting new talent and professionals with the necessary skills in order to sustain its leadership, competitiveness and sustainability in the medium to long-term. The synergies between ASSETs+ activities and intended outcomes with the Pact for Skills towards upskilling and reskilling workforce are evident and important towards addressing to the skill needs of the Defence industry.

This document is a preparatory document for the ASSETs+ project's mid to long-term strategy in developing HR for the Defence sector. The inputs from WP1 are part of an important building block of the strategy, particularly through the Defence Technology Roadmap (T1.2) and the Skills Blueprint (T1.3), which are available online at the following [link](#).

Therefore, the EDSP strategy (European Defence Skills Strategy 2020-2024), the Pact for Skills and the Action Plan on Synergies between Civil, Defence and Space Industries, will be the basis to develop the actions and recommendations addressing the Defence sector's HR needs. The deliverable R4.2 **Strategy for developing HR in the Defence sector** will present the initiative of the project for tackle the challenges and mitigate the risks, considering both the ASSETs+'s lifetime and the sustainability of the actions after the closure of the project.

