Towards a green, digital and resilient European ASD Industrial Ecosystem

Summary report on ASD pathways thematic workshops

Brussels, 31 October 2023

1. INTRODUCTION

1.1   Context

This report summarises the conclusions drawn from a series of four workshops (Exhibit 1) organised by the Directorate-General for Defence Industry and Space (DG DEFIS) to enable stakeholders to provide insights in preparation of the Transition pathway for the aerospace and defence (ASD) industrial ecosystem. These sessions were designed to explore four pivotal areas shaping the future of the ecosystem: resilience and the capability to operate during war and crises, the green transition, the digital transition, and competitiveness and access to resources. With the ASD ecosystem standing at the crossroads of significant transformations, these workshops provided a unique platform for industry representatives and experts to share their insights. Their contributions shed light on current challenges and reflected on potential industry actions to pave the way for co-creating pathways for the twin transition, and bolstering resilience and competitiveness in the ASD sector.

Exhibit 1: Overview of held workshop series

Workshop theme	Dates
Resilience & capability to operate during war & crises	9th October 2023
Green transition	11th October 2023
Digital transition	16th October 2023
Competitiveness & access to resources	17th October 2023
Workshops' key agenda topics *(interactive discussions with participants)*	
▪ Core challenges for the sector (linked to workshop theme) ▪ Introduction of proposed actions and feedback (linked to workshop theme) ▪ Cross-cutting questions & identification of new elements	

While the main focus related to actions that the industry might pursue, participants also voiced their views on actions that the public institutions could take. In parallel to these workshops, an **online survey** has been published by DG DEFIS to solicit feedback from the ecosystem, including private companies, public sector entities, and even private citizens. At the time of writing, the survey is still ongoing (closing date 3rd November 2023) and ASD industrial ecosystem members are strongly encouraged to respond.

1.2   Participants

A total of 73 unique participants[1] joined the four workshops. Some participants attended two workshops and have been counted for each in the breakdown by workshop in Exhibit 2, but not counted twice in the breakdown by sector. Participants represented 47+ organisations[2] from 15+ countries. A summary of participant profiles is presented in the exhibits overleaf.

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[1] Excluding moderators but including non-moderator representatives from within the European Commission.

[2] 4 participants did not indicate their affiliation in a suitable manner.

Exhibit 2: Attendee numbers per workshop and breakdown by sector (self-identified by participants, excluding moderators).
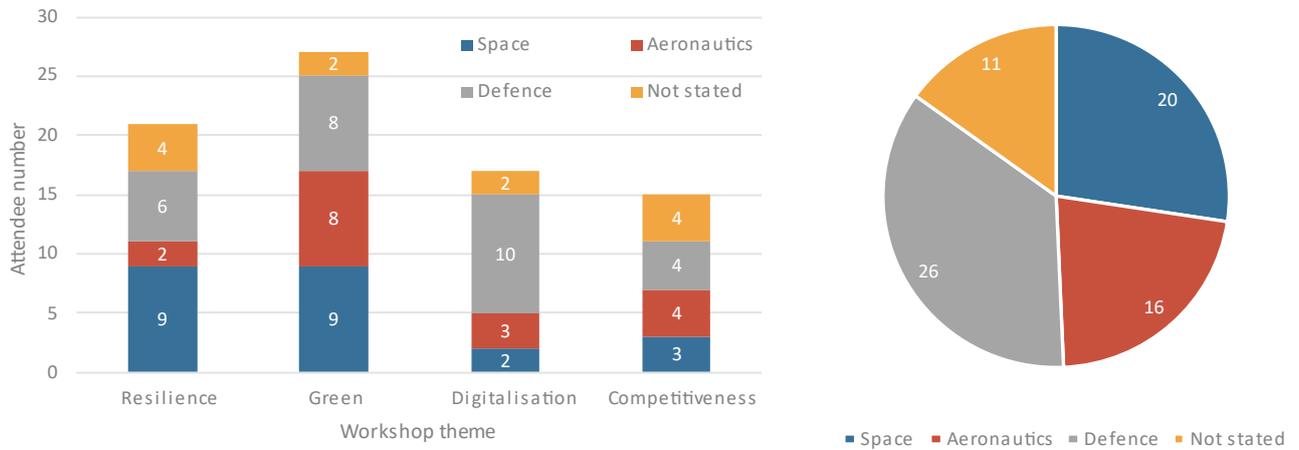

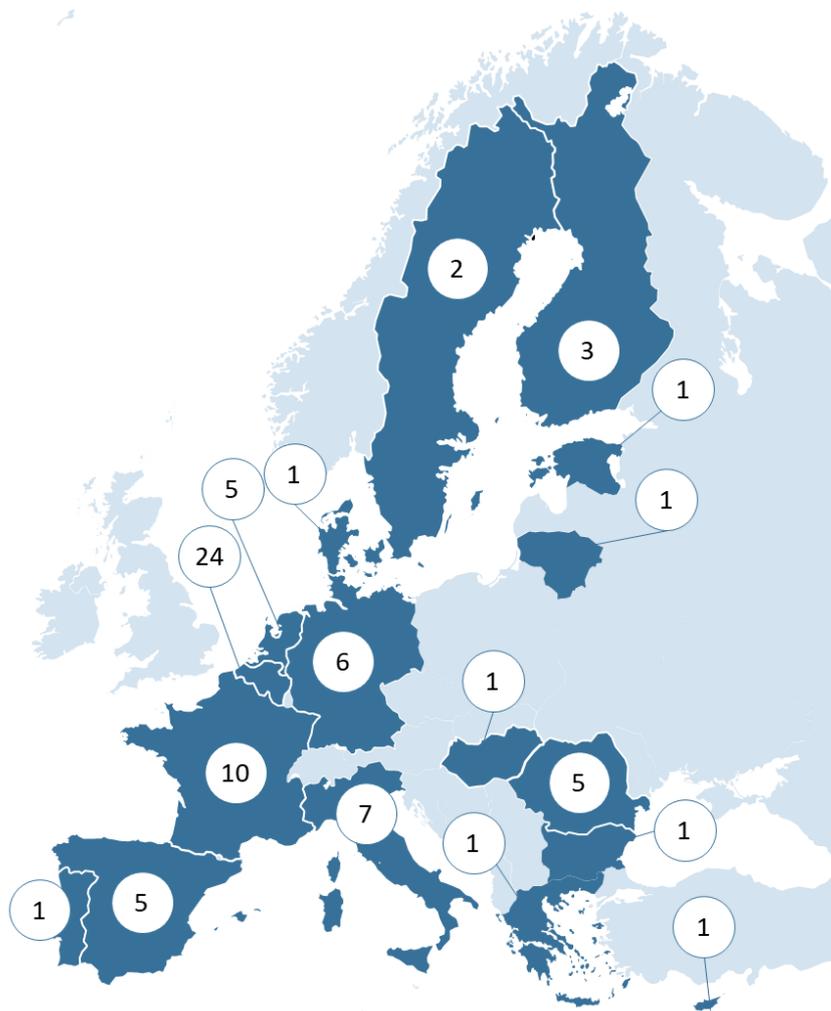Exhibit 3: Overview of participation by country.

Exhibit 4: Overview of participating organisations.

Agoria/BSDI	**ESA / ROSA**
Air Liquide	**European Aerospace Cluster Partnership**
AIRBUS	**European Commission** (incl. DEG DEFIS, DG RTD, JRC)
ArianeGroup	**European Defence Agency**
Arianespace	**Fincantieri Group**
ARQUUS	**GKN Aerospace**
ASD Eurospace	**GMV**
Association of Finnish Defence and Aerospace Industries	**HENSOLDT**
Avio Aero	**INCAS**
Baltic Defence College	**Indra**
BDSV/BDI	**Lut University**
CASD - Centre for High Defence Studies	**MaiaSpace**
CDTI - Centre for the Development of Industrial Technology	**YEESS**
CETENA S.p.A. - Centro per gli Studi di Tecnica Navale (a Fincantieri company)	**Navantia, S.A., S.M.E.**
EIGHT BELLS LTD	**PATROMIL** - National Defence Industry Association
CY4GATE SPA	**Prisma Electronics**
Dassault Aviation	**REACHLaw Ltd** (as contractor to ESA)
Diehl Stiftung & Co. KG.	**Remred**
DTU - Technical University of Denmark	**RHEA**
EARSC	**Saab AB**
EATEO	**Safran**
EEAS	**SAP**
Eindhoven University of Technology	**Sopra Steria**
Embedded Acoustics BV	**TEKEVER**
EnduroSat	**ThalesAlenia Space**

2. WORKSHOP INSIGHTS

2.1 Theme-specific insights on industry challenges

The following sections give an overview of some of the insights on industry challenges from the workshops as relevant to each of the corresponding themes.

2.1.1 Resilience and the capability to operate during war and crises

- ASD sector difficult to analyse needs, because of very long and complex supply chains

- Long development cycles; challenges due to small procurement volumes; supplier (near-)monopolies

- Agility & adaptability can be a challenge but also an opportunity due to dual nature

- Stockpiling vs. just-in-time need to be balanced

2.1.2 Green transition

- Estimating environmental impacts: costly, no harmonised framework or process to provide reliable data (e.g., measuring the impact of launches is highly complex and companies currently lack means to assess the monetary value of sustainability efforts) – although some experience exists on the defence sector

- Agreement that the green transition is vital, but difficult, especially considering the defence industry's difficulties in accessing finance but also green energy

- Need for sector-specific goals, clear indicators for tracking, and EU-level criteria to ensure fairness

- Understanding of key themes including reusability is patchy

- Environmental issues are important but come at a cost that customers do not always want to bear

- Banning of PFAS (per- and polyfluoroalkyl substances) within REACH (regulation on the registration, evaluation, authorisation and restriction of chemicals) would be a major problem

- Additive Manufacturing creates possibilities for green transition

2.1.3 Digital transition

- Human element due to humans as users of digital technologies; lack of training and buy-in

- Vulnerability of defence operations due to reliance on digital technologies if not bolstered by resilience / alternatives

- EU hyperscaler landscape & other digital infrastructure are struggling to compete with the US

- AI is important, both in products and in manufacturing/production, and needs to be further leveraged.

- Cyber security is paramount, including accounting for ASD sector-specific needs

2.1.4 Competitiveness and access to resources

- To remain competitive, it is essential to continue and enhance sustainable and resilient investments, including in RD&I

- Access to skills is a key issue, particularly considering similar needs and potentially higher attractiveness of other sectors (e.g., ICT) – forecasting skills needs is important, as well as revitalising the Pact for Skills

- In particular for defence, with governments as sole customers and limited markets, demand harmonisation and common procurement are important actions to support and encourage

- R&D results are not sufficiently and swiftly integrated into operational capabilities; important to ensure dissemination of relevant information through new innovative procurement models and by stimulating concept developments and experimentation

2.2 Cross-cutting insights on industry challenges

Cross-cutting all four themes, participants highlighted challenges and needs, proposing ways to address them on topics linked to collaboration as well as finance.

- Collaboration: Key stakeholder involvement; centralised approach; aggregation & anonymisation to alleviate security concerns when sharing best practices on all themes with the ecosystem; specialised fora, industrial alliances & holistic ecosystem approach

- Finance: Growing unease due to environmental, social, and corporate governance (ESG) market restrictions; challenges with access to funding. It is important to ensure stronger involvement of the private banking sector when it comes to financing

2.3 Workshop insights on proposed industry actions

The moderators introduced the proposed ASD industry actions (see Exhibits in the Annex) included in a series of Food for Thought (FFT) papers shared with the workshop attendees ahead of the workshops as a means to stimulate the discussion.

Based on the views and challenges indicated by participants, DG DEFIS derived 7 ASD industry actions in addition to those identified in the papers.

Exhibit 5: Additional proposed ASD industry actions derived from workshops.

Theme	Category	Potential industry actions
Green transition	Sustainable production & operations	▪ Set clear company-internal sustainability targets and contribute to sector-wide formulation ▪ Ensure sustainability & performance requirements are balanced
Digital transition	Industry 4.0 & smart manufacturing	▪ Ensure AI technologies are adopted & leveraged
Competitiveness	Innovation	▪ Swiftly integrate R&D results into operational capabilities
	Workforce & skills	▪ Contribute to skills needs forecasting
Cross-cutting	Ecosystem collaboration	▪ Consider anonymisation and other best practices for data sharing ▪ Educate staff and ensure understanding & buy-in at all company levels

2.4 Workshop insights on institutional actions

Participants also discussed ways in which the EU, MS governments, and institutions can support the sector. Suggestions included:

- Comprehensive and up-to-date supplier lists (e.g., ESA)

- Harmonised and consolidated demand, especially for defence applications with governments as sole customers

- More procurement by EU governments to support the local ecosystem rather than foreign ones

- Better access to R&D (and other) funding, increased budgets, simplified administrative processes of EU and national programs and reduced burden

- Development of matchmaking initiatives

- Clearer communication regarding regulations at both national and EU levels

- Consolidation, alignment, and consistency across different regulations or policies and across MSs

- Ensure specific needs of the ASD ecosystem (including dual use) are considered in the formulation of policy and regulations

- Exemptions in certain regulations for the sector (e.g., REACH)

- Better Security of Information Protocol at EU level

ANNEX: SUMMARY OF ACTIONS FROM THE FFT PAPERS

Exhibit 6: Overview of proposed ASD industry actions for resilience.

Category	Potential industry actions	
Access to critical assets	▪ Balance resilience and business ▪ Reconsider just-in-time ▪ Build redundancies ▪ Foster agile culture	▪ Conduct grey zone exercises ▪ Share data ▪ Plan with contingencies
Finance	▪ Assess FDI risk ▪ Rely on enforceable legal contracts	▪ Consider dual-use outbound investments carefully
Supply chains & energy	▪ Conduct supply chain resilience audits (stress tests) ▪ Diversify sourcing	▪ Shift to a circular economy ▪ Prepare to buy EU-made ▪ Coordinate joint procurement
Control & norms	▪ Secure company control ▪ Develop best practices to determine shared processes and company control ▪ Follow export control agreements	▪ Innovate in export control ▪ Coordinate norm setting ▪ Uphold norms

Exhibit 7: Overview of proposed ASD industry actions for green transition.

Category	Proposed industry actions	
Circular economy	▪ Implement the circular economy ▪ Foster an environmentally conscious culture	▪ Support harmonisation of lifecycle assessment practices ▪ Assess value chain sustainability
Innovation & design	▪ Ensure sustainability by design ▪ Integrate social science ▪ Avoid path dependence	▪ Align research ▪ Serve as role model above legislative requirements
Supply chains	▪ Prepare to buy EU-made ▪ Assess sensitive production ▪ Cooperate in joint procurement ▪ Shorten supply chains	▪ Utilise innovative technologies for footprint monitoring & optimisation ▪ Develop travel policies & incentivise implementation
Sustainable production & operations	▪ Reduce waste ▪ Provide maintenance ▪ Reuse or retrofit systems ▪ Design for recycling ▪ Cooperate in initiatives ▪ Assess recycling viability of existing systems ▪ Ensure transparent monitoring & reporting	▪ Utilise emerging SSA / STM / SDM solutions ▪ Support research into solutions' impacts ▪ Increase renewable energy use ▪ Examine activities through EU taxonomy ▪ Embrace sustainable fuels & propulsion ▪ Build & operate responsibly

Exhibit 8: Overview of proposed ASD industry actions for digital transition.

Category	Potential industry actions	
Data gathering	▪ Integrate IoT in manufacturing ▪ Integrate IoT in battlefield operations ▪ Track GHG with IoT sensors ▪ Meet demand for orbital ISR	▪ Control supply chains through IoT ▪ Participate in SSA initiatives ▪ Develop space downstream applications
Connectivity & communication	▪ Continue to drive connectivity technologies ▪ Leverage ubiquitous connectivity	▪ Harden systems & manage vulnerabilities
Data standardisation & structure	▪ Standardise data structures ▪ Engage with DPP & other EU initiatives	▪ Uphold data sovereignty
Data analytics & processing	▪ Participate in DIHs ▪ Manage hype cycles ▪ Follow EU guidelines for trustworthy AI	▪ Use digital twins & MBSE for prototyping ▪ Embrace predictive maintenance ▪ Employ new methods incl. VR / AR
Computing hardware	▪ Pursue dialogue with cloud service providers ▪ Develop & integrate cloud-compatible hardware ▪ Engage with EUAIDEC	▪ Beware of lock-ins ▪ Use the EuroHPC JU ▪ Interact with innovation clusters ▪ Develop quantum computing skills
Industry 4.0 & smart manufacturing	▪ Design safe human-machine interactions ▪ Integrate additive manufacturing	▪ Consider back-up systems & contingency plans
Cyber security	▪ Prepare for cyberphysical threats ▪ Secure new attack vectors ▪ Follow guidance on space cybersecurity ▪ Decommission or secure legacy systems ▪ Prevent theft of encrypted data	▪ Support encryption standards-setting ▪ Adopt new standards wisely ▪ Educate workforce on social engineering ▪ Simulate social engineering attacks ▪ Adopt culture of security awareness

Exhibit 9: Overview of proposed ASD industry actions for competitiveness.

Category	Potential industry actions	
Innovation	▪ Seek spin-ins and spin-offs ▪ Apply RRI ▪ Apply open innovation	▪ Engrain innovation in company culture ▪ Encourage cross-sector fertilisation ▪ Pursue customer & stakeholder dialogue
Industrial process & assets	▪ Modernise manufacturing & technology chains	▪ Implement agile processes
Partnerships	▪ Ensure ownership of critical technologies ▪ Ensure supply chain efficiency & stability ▪ Support harmonisation & clarification of export controls within the EU	▪ Cooperate within the EU ▪ Join innovation clusters ▪ Strengthen export controls to 3rd countries ▪ Support economic diplomacy missions
Workforce & skills	▪ Foster industry-academia links ▪ Continue participation in Pact for Skills ▪ Support re-skilling ▪ Implement measures to retain workforce ▪ Attract talent with inspirational examples	▪ Implement inclusive strategies & recruiting ▪ Improve channels to report discrimination ▪ Invest in DEI education ▪ Raise awareness on DEI issues
Knowledge transfer	▪ Employ collaborative practices	▪ Pursue knowledge exchange & partnerships
Intellectual property	▪ Apply best practices in IP protection	▪ Approach IP protection socio-technically
Finance	▪ Evaluate risk of third country VC exits ▪ Seek financial advice for startups ▪ Make the most of EU R&D funding ▪ Ensure alignment of investor priorities ▪ Fulfil EU ESG reporting obligations ▪ Harness small cooperation clusters	▪ Communicate ESG actions clearly with the public ▪ Coordinate with MS and EC to access MS procurement cooperation budgets ▪ Respond promptly to demand ▪ Align multinational defence planning targets