



# ARTIFICIAL INTELLIGENCE

### ----- CREATION DATE 7 févr. 2025 -----

## Funding Opportunities Report





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| #  | Funding opportunity   | Deadline      |
|----|---|---------------|
| 1  | HORIZON-JU-IHI-2025-09-04-single-stage (HORIZON-JU-RIA)<br>Boosting innovation through exploitation of digitalisation and data exchange in<br>healthcare  | 29 avr. 2025  |
| 2  | HORIZON-JU-IHI-2025-09-02-single-stage (HORIZON-JU-RIA)<br>Boosting innovation through better integration of fragmented health R&I efforts  | 29 avr. 2025  |
| 3  | <b>DIGITAL-ECCC-2024-DEPLOY-CYBER-07-KEYTECH</b> (DIGITAL-JU-SME)<br>Development and Deployment of Advanced Key Technologies  | 27 mars 2025  |
| 4  | <b>ERASMUS-EDU-2025-PI-FORWARD-DIGITAL-AI</b> (ERASMUS-LS)<br>Topic 7: Digital education: Ethical and effective use of generative Artificial Intelligence<br>systems in education and training' | 27 mai 2025   |
| 5  | HORIZON-SESAR-2025-DES-ER-03-WA2-1 (HORIZON-JU-RIA)<br>Research to help shape the future regulatory framework for a DES   | 16 sept. 2025 |
| 6  | VILNIUS TECH MERIT Project Targeted Scholarship Call ()<br>VILNIUS TECH MERIT Project Targeted Scholarship Call   | 15 oct. 2025  |
| 7  | VILNIUS TECH MERIT Project Excellence Scholarship and Mobility Grant Award Call<br>()<br>VILNIUS TECH MERIT Project Excellence Scholarship and Mobility Grant Award Call                        | 30 juin 2026  |
| 8  | HORIZON-JU-IHI-2025-09-01-single-stage (HORIZON-JU-RIA)<br>Boosting innovation for a better understanding of the determinants of health   | 29 avr. 2025  |
| 9  | <b>HORIZON-JU-IHI-2025-09-05-single-stage</b> (HORIZON-JU-RIA)<br>Boosting innovation for better assessment of the added value of innovative<br>integrated healthcare solutions                 | 29 avr. 2025  |
| 10 | HORIZON-JU-IHI-2025-09-03-single-stage (HORIZON-JU-RIA)<br>Boosting innovation for peopled centred integrated healthcare solutions  | 29 avr. 2025  |
| 11 | <b>HORIZON-JU-IHI-2024-08-03-two-stage</b> (HORIZON-JU-RIA)<br>Modelling regulatory sandbox mechanisms and enabling their deployment to<br>support breakthrough innovation                      | 23 avr. 2025  |
| 12 | HORIZON-JU-IHI-2024-08-02-two-stage (HORIZON-JU-RIA)<br>Novel Endpoints for Osteoarthritis (OA) by applying Big Data Analytics  | 23 avr. 2025  |
| 13 | CREA-CROSS-2025-INNOVLAB (CREA-PJG)<br>Creative Innovation Lab  | 24 avr. 2025  |

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|----|--|---------------|
| 14 | HORIZON-JU-IHI-2024-08-04-two-stage (HORIZON-JU-RIA)<br>Patient-Centred Clinical-Study Endpoints Derived Using Digital Health Technologies   | 23 avr. 2025  |
| 15 | DIGITAL-ECCC-2024-DEPLOY-CYBER-07-SOC (DIGITAL-JU-SIMPLE)<br>National SOCs   | 27 mars 2025  |
| 16 | DIGITAL-ECCC-2024-DEPLOY-CYBER-07-SOCPLAT (DIGITAL-JU-SIMPLE)<br>Enlarging existing or Launching New Cross-Border SOC Platforms  | 27 mars 2025  |
| 17 | <b>ERASMUS-EDU-2025-PI-FORWARD-ADULT-CG</b> (ERASMUS-LS)<br>Topic 5: Adult learning: Improving career guidance to support adults' participation in<br>training   | 27 mai 2025   |
| 18 | HORIZON-SESAR-2025-DES-IR-02-WA4-1 (HORIZON-JU-RIA)<br>Next generation ATS platform for airport operations   | 16 sept. 2025 |
| 19 | <b>3rd 6G-XR Open Call - Vertical Replicability enablers</b> ()<br>3rd 6G-XR Open Call - Vertical Replicability enablers   | 7 mars 2025   |
| 20 | ERASMUS-EDU-2025-PI-ALL-INNO-EDU-ENTERP (ERASMUS-LS)<br>Alliances for Education and Enterprises  | 6 mars 2025   |
| 21 | HORIZON-SESAR-2025-DES-ER-03-WA1-4 (HORIZON-JU-RIA)<br>Fundamental research for other topics   | 16 sept. 2025 |
| 22 | DIGITAL-ECCC-2024-DEPLOY-CYBER-07-SOCSYS (DIGITAL-JU-CSA)<br>Strengthening the SOC Ecosystem   | 27 mars 2025  |
| 23 | HORIZON-EUROHPC-JU-2024-INCO-06 (HORIZON-JU-RIA)<br>EuroHPC International Cooperation  | 27 févr. 2025 |
| 24 | HORIZON-SESAR-2025-DES-ER-03-WA1-3 (HORIZON-JU-RIA)<br>Investigate quantum sensing and computing applied to ATM  | 16 sept. 2025 |
| 25 | HORIZON-SESAR-2025-DES-IR-02-WA5-1 (HORIZON-JU-RIA)<br>Increased automation assistance for the pilot for ATM tasks   | 16 sept. 2025 |
| 26 | HORIZON-JU-GH-EDCTP3-2025-02-FELLOW-01-two-stage (HORIZON-JU-CSA)<br>Global Health EDCTP3 JU and contributing partners funded Strategic Training Hubs<br>for Fellowships in Public Health covering Biostatistics, Epidemiology and Modelling | 20 mars 2025  |
| 27 | HORIZON-SESAR-2025-DES-IR-02-WA6-3 (HORIZON-JU-IA)<br>Fast-track Enabling innovative air mobility (IAM) / Vertical take-off and landing<br>capable aircraft (VCA) (crewed and uncrewed) operations   | 16 sept. 2025 |

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| #  | Funding opportunity  | Deadline      |
|----|--|---------------|
| 28 | SUSRUR Open Call 3 - COLLABORATE ()<br>SUSRUR Open Call 3 - COLLABORATE  | 12 févr. 2025 |
| 29 | ERASMUS-EDU-2025-PEX-COVE (ERASMUS-LS)<br>Centres of Vocational Excellence   | 11 juin 2025  |
| 30 | Women TechEU Open Call #3 ()<br>Women TechEU Open Call #3  | 17 mars 2025  |
| 31 | HORIZON-JU-CLEANH2-2025-01-03 (HORIZON-JU-RIA)<br>Scale-up and Optimisation of manufacturing processes for electrolyser materials,<br>cells, or stacks | 23 avr. 2025  |
| 32 | HORIZON-SESAR-2025-DES-ER-03-WA1-1 (HORIZON-JU-RIA)<br>ATM impact on climate change  | 16 sept. 2025 |
| 33 | HORIZON-SESAR-2025-DES-IR-02-WA1-1 (HORIZON-JU-RIA)<br>Transformation to trajectory-based operations   | 16 sept. 2025 |
| 34 | HORIZON-SESAR-2025-DES-IR-02-WA3-1 (HORIZON-JU-RIA)<br>Next generation ATS platforms for en-route and TMA operations                                   | 16 sept. 2025 |

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# **1. HORIZON-JU-IHI-2025-09-04-single-stage (HORIZON-JU-RIA)** Boosting innovation through exploitation of digitalisation and data exchange in healthcare

| Status | Opening date  | Deadlines    | Funding type           | Keywords |
|--------|---------------|--------------|------------------------|----------|
| Open   | 16 janv. 2025 | 29 avr. 2025 | HORIZON-JU-RIA         |          |
|        |               |              | HORIZON JU Research    |          |
|        |               |              | and Innovation Actions |          |

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#### **Description:**

#### Expected Impact:

The actions to be funded under this topic are expected to achieve the following:

a. contribute to one or more of IHI JU's expected impacts linked to IHI JU's Specific Objective 4, as reflected in the IHI JU SRIA, i.e.: wider availability of interoperable, quality data, respecting FAIR (findable, accessible, interoperable, reusable) principles, facilitating research and the development of integrated products and services; improved insight into the real-life behaviour and challenges of patients with complex, chronic diseases and co-morbidities thanks to m-health and e-health technologies; advanced analytics / artificial intelligence supporting health R&I, resulting in a) clinical decision support for increased accuracy of diagnosis and efficacy of treatment; b) shorter times to market; c) wider availability of personalised health interventions to end-users; d) better evidence of the added value from new digital health and artificial intelligence tools, including reduced risk of bias due to improved methodologies.

b. contribute to strengthening the competitiveness of the EU's health industry via increased economic activity in the development of health technologies, in particular, integrated health solutions, thus fostering European technological leadership and the digital transformation of our societies.

The actions are expected to contribute to EU programmes, initiatives and policies such as the European Green Deal, Europe's Beating Cancer Plan, the EU Mission on Cancer, the European Virtual Human Twins Initiative, the European Health Emergency Preparedness and Response Authority (HERA), the European Commission's proposal for the European Health Data Space (EHDS), and the EU Artificial Intelligence Act1, where relevant.

1 EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act

#### Expected Outcome:

Applicants must define the outcomes expected to be achieved by the project ensuring that they contribute to at least one of I HI JU's potential outputs linked to the IHI JU's Specific Objective 4 'exploit the full potential of digitalisation and data exchange in healthcare', as reflected in the IHI JU Strategic Research and Innovation Agenda (SRIA).

Actions (projects) to be funded under this topic must deliver results that address public health needs and support the development of future health innovations that are safe, people-centred, effective, cost-effective and affordable for patients and for health care systems.

The expected outcomes may cover the entire spectrum of care and may be health technologies centred around disease areas and/or key themes such as prevention, precision diagnostics, personalised medicine, and chronic disease management. They may also include solutions for key enablers such as digital data and solutions, artificial intelligence (AI), regulatory science, greener and more sustainable healthcare, and implementation science1.

1 In the context of IHI, 'implementation science' refers to the development and piloting of methods and strategies that facilitate the uptake 7 févr. 2025 | Open and forthcoming funding opportunities for artificial intelligence area

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of evidence-based practice and research outcomes into regular use (e.g. translation of results, uptake, scale-up, piloting in healthcare). Scope:

With a view to harnessing new science and technologies, this topic aims to fund pre-competitive research and innovation for novel tools, methods, technologies etc. that will foster the development of health innovations to prevent, intercept, diagnose, treat and manage diseases and enable recovery more efficiently.

Accordingly, applicants must assemble a collaborative public-private partnership consortium reflecting the integrative and cross-sectoral nature of IHI JU that is capable of directly addressing the challenge(s) and scope of the IHI JU Specific Objective 4 'exploit the full potential of digitalisation and data exchange in healthcare', as defined in IHI JU's legal basis1 and described in more detail in the IHI JU SRIA2:

Applicants should consider the following points in their proposals:

a. address an unmet public health need based on at least one of the below:

the high burden of the disease for patients and/or society due to its severity and/or the number of people affected by it; the high economic impact of the disease for patients and society; the transformational nature of the potential results on innovation processes where projects are not focussed on individual disease areas (e.g. health data analytics).

b. demonstrate the ability to translate research into innovative solutions that can be integrated/implemented into the health care ecosystem (taking into consideration the fragmented nature of European healthcare systems) and/or into industrial processes.

When applicable, proposals should consider relevant aspects of patient-centricity, with the help of the most suitable health technologies and/or social innovations, including open science and taking demographic trends into account as relevant.

If applicable, applicants are expected to consider the potential regulatory impact of the anticipated project's outputs, and, as relevant, develop a regulatory strategy and interaction plan for generating appropriate evidence and for engaging with regulators and other bodies in a timely manner, e.g. EU national competent authorities, notified bodies for medical devices and in vitro diagnostic devices, health technologies assessment (HTA) agencies, and the European Medicines Agency (EMA), through existing opportunities for regulatory support services such as the Innovation Task Force and qualification advice.

As relevant, consideration should also be given to the Health Data Access Bodies that will be established under the forthcoming European Health Data Space Regulation3 in the context of secondary use of data.

Applicants should consider relevant existing initiatives/projects to ensure synergies and complementarities and avoid unnecessary overlap and duplication of efforts. The proposal should include a plan on how to synergise with these initiatives.

1 Article 115 of the Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe

2 https://www.ihi.europa.eu/sites/default/files/flmngr/IHI\_Strategic\_Research\_and\_Innovation\_Agenda\_3.pdf

3 https://www.europarl.europa.eu/doceo/document/TA-9-2024-0331\_EN.pdf

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### **2. HORIZON-JU-IHI-2025-09-02-single-stage (HORIZON-JU-RIA)** Boosting innovation through better integration of fragmented health R&I efforts

| Status | Opening date  | Deadlines    | Funding type  | Keywords |
|--------|---------------|--------------|---|----------|
| Open   | 16 janv. 2025 | 29 avr. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

#### URL in Kaila:

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#### Description:

Expected Impact:

The actions to be funded under this topic are expected to achieve the following:

a. contribute to one or more of IHI JU's expected impacts linked to IHI JU's Specific Objective 2, as set out in the IHI JU SRIA, i.e. breaking down fragmentation between various disciplines of medicine and technological areas in order to conceive and develop technologically and socially innovative, people-centred, integrated healthcare solutions that can seamlessly be introduced in healthcare systems; fostering development of safe and effective innovative health technologies and their combinations thanks to new and harmonised approaches to data generation; better and faster integration of future products, services and tools along the healthcare pathway (including health promotion and disease prevention), responding to patients' specific needs and leading to improved health outcomes and patient well-being; patients and industry benefit from innovative manufacturing processes such as 3D printing, on-demand small-scale good manufacturing practice (GMP) synthesis, on-site portable production systems etc.; green transition enabled across all aspects of healthcare, both in the delivery of healthcare to patients, and in the technologies and products that emerge from a competitive European industry. b. contribute to strengthening the competitiveness of the EU's health industry, via increased economic activity in the development of health technologies, in particular, integrated health solutions, thus fostering European technological leadership and the digital transformation of our societies.

The actions are expected to contribute to EU programmes, initiatives and policies such as the European Green Deal, Europe's Beating Cancer Plan, the EU Mission on Cancer, the European Health Emergency Preparedness and Response Authority (HERA), the European Commission's proposal for the European Health Data Space (EHDS), and the EU Artificial Intelligence Act1, where relevant.

#### 1 EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act

#### Expected Outcome:

Applicants must define the outcomes expected to be achieved by the project, ensuring that they contribute to at least one of IHI JU's potential outputs linked to the IHI JU Specific Objective 2'integrate fragmented health research and innovation efforts bringing together health industry sectors and other stakeholders, focussing on unmet public health needs, to enable the development of tools, data, platforms, technologies and processes for improved prediction, prevention, interception, diagnosis, treatment and management of diseases, meeting the needs of end-users' as set out in the IHI JU Strategic Research and Innovation Agenda (SRIA).

Actions (projects) to be funded under this topic must deliver results that address public health needs and support the development of future health innovations that are safe, people-centred, effective, cost-effective and affordable for patients and for health care systems.

The expected outcomes may cover the entire spectrum of care and may be health technologies centred around disease areas and/or key themes such as prevention, precision diagnostics, personalised medicine, and chronic disease management. They may also include solutions for key enablers such as digital data and solutions, artificial intelligence (AI), regulatory science, greener and more sustainable healthcare, and implementation science1.

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1 In the context of IHI, 'implementation science' refers to the development and piloting of methods and strategies that facilitate the uptake of evidence-based practice and research outcomes into regular use (e.g. translation of results, uptake, scale-up, piloting in healthcare). Scope:

With a view to harnessing new science and technologies, this topic aims to fund pre-competitive research and innovation for novel tools, methods, technologies etc. that will foster the development of health innovations to prevent, intercept, diagnose, treat, and manage diseases and enable recovery more efficiently.

Accordingly, applicants must assemble a collaborative public-private partnership consortium reflecting the integrative and cross-sectoral nature of IHI JU, that is capable of addressing the challenge(s) and scope of the IHI JU Specific Objective 2 'integrate fragmented health research and innovation efforts bringing together health industry sectors and other stakeholders, focussing on unmet public health needs, to enable the development of tools, data, platforms, technologies and processes for improved prediction, prevention, interception, diagnosis, treatment and management of diseases, meeting the needs of end-users' as defined in IHI JU's legal basis1 and described in more detail in the IHI JU SRIA2:

Applicants should consider the following points in their proposals:

a. address an unmet public health need based on at least one of the below:

the high burden of the disease for patients and/or society due to its severity and/or the number of people affected by it; the high economic impact of the disease for patients and society; the transformational nature of the potential results on innovation processes where projects are not focussed on individual disease areas (e.g. health data analytics).

b. demonstrate the ability to translate research into innovative solutions that can be integrated/implemented into the health care ecosystem (taking into consideration the fragmented nature of European healthcare systems) and/or industrial processes.

When applicable, proposals should consider relevant aspects of patient-centricity, with the help of the most suitable health technologies and/or social innovations, including open science and taking demographic trends into account as relevant.

Proposals may address specific target populations, underserved communities or areas with limited resources, and/or support challenging unmet needs and diagnostic or treatment gaps.

If applicable, applicants are expected to consider the potential regulatory impact of the anticipated project's outputs and, as relevant, develop a regulatory strategy and interaction plan for generating appropriate evidence and for engaging with regulators and other bodies in a timely manner, e.g. EU national competent authorities, notified bodies for medical devices and in vitro diagnostic devices, health technologies assessment (HTA) agencies and the European Medicines Agency (EMA) through existing opportunities for regulatory support services such as the Innovation Task Force and qualification advice.

As relevant, consideration should also be given to the Health Data Access Bodies that will be established under the forthcoming European Health Data Space Regulation3 in the context of secondary use of data.

Applicants should consider relevant existing initiatives/projects to ensure synergies and complementarities and avoid unnecessary overlap and duplication of efforts. The proposal should include a plan on how they propose to synergise with these initiatives.

1 Article 115 of the Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe

 $2\ https://www.ihi.europa.eu/sites/default/files/flmngr/IHI_Strategic_Research_and_Innovation_Agenda_3.pdf$ 

3 https://www.europarl.europa.eu/doceo/document/TA-9-2024-0331\_EN.pdf

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### **3. DIGITAL-ECCC-2024-DEPLOY-CYBER-07-KEYTECH (DIGITAL-JU-SME)** Development and Deployment of Advanced Key Technologies

| Status | Opening date | Deadlines    | Funding type           | Keywords |
|--------|--------------|--------------|------------------------|----------|
| Open   | 4 juil. 2024 | 27 mars 2025 | DIGITAL-JU-SME         |          |
|        |              |              | DIGITAL JU SME Support |          |
|        |              |              | Actions                |          |

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#### **Description:**

Expected Outcome:Deployment of state-of-the-art technologies in the area of cybersecurityTools for automated threat detection, monitoring of networks, data protection and incident response Objective:

Breakthroughs in Key Digital Technologies such as Artificial Intelligence (including generative AI and adversarial AI), Big Data Analytics, Quantum, Blockchain Technology, High Performance Computing and Software-Defined Networking, create new opportunities for advancing cybersecurity in the areas of vulnerability detection, threat detection and rapid response, reducing the window of opportunity for attackers to exploit these vulnerabilities. Furthermore, they may enable new possibilities to protect data security and privacy.

The objective is to enable European cybersecurity actors to take advantage of these new breakthroughs, improving detection and prevention capabilities, efficiency, scalability, and facilitating data sharing and regulatory compliance.

In particular innovative technologies should allow for the processing of larger amounts of data, automating real-time pattern recognition, log analysis, vulnerability scanning, while enabling security professionals to focus on higher level interpretation of data and response decisions. They should allow organisations to deploy solutions and larger scale, and in increasingly complex environments.

A priority is to create and strengthen capacity for original Cyber Threat Information (CTI), e.g., in the form of CTI feeds or services. Scope:

Activities should fortify cybersecurity capabilities using breakthrough technologies, encompassing various aspects of cybersecurity. This involves uptake and integration for the deployment of novel tools, systems and services for threat detection, incident response, malware defence, vulnerability management, data protection and so forth. In one or more of the following topics should be addressed: Real-time Monitoring and Incident Response: ensuring the swift identification and response to security incidents through continuous network monitoring, alert generation, and automated response mechanisms.Malware Defence and Analysis: mitigating malware threats by analysing code behaviour, scrutinizing network traffic, and assessing file characteristics, thereby reducing opportunities for attackers to exploit vulnerabilities.Proactive Vulnerability Management: identifying and addressing weaknesses proactively through automated vulnerability scanning and penetration testing to address potential threats before they can be exploited.Data Protection and Anomaly Detection: safeguarding sensitive data by scrutinizing access patterns and identifying abnormal behaviour to mitigate data breaches and protect critical information.Incident investigation to help uncover cause, scope and impact of security incidents or breaches that have occurred.Data Utilisation with Privacy: enabling organisations to harness data for analysis and insights while preserving data security and privacy through techniques such as anonymisation and de-identification.

By addressing such issues, the cybersecurity resilience of organisations should be enhanced, improving overall cybersecurity posture, encompassing various aspects such as threat detection, incident response, and vulnerability management.

In well justified cases, access requests to the EuroHPC high performance computing infrastructure could be granted.

The systems, tools and services developed under this topic, where relevant, will be made available for licencing to National and/or Cross-Border SOC platforms under favourable market conditions.

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This action aims at the deployment of key technologies in cybersecurity, in particular also in the context of securing national authorities, providers of critical infrastructures and essential services. As this involves the handling of cyber incidents, malware and management of vulnerabilities that could be exploited by malicious actors, the deployment of such technologies must be protected against possible dependencies and vulnerabilities in cybersecurity to pre-empt foreign influence and control. As previously noted, participation of non-EU entities entails the risk of highly sensitive information about security infrastructure, risks and incidents being subject to legislation or pressure that obliges those non-EU entities to disclose this information to non-EU governments, with an unpredictable security risk. Therefore, based on the outlined security reasons, the actions relating to these technologies are subject to Article 12(5) of Regulation (EU) 2021/694.

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### 4. ERASMUS-EDU-2025-PI-FORWARD-DIGITAL-AI (ERASMUS-LS)

Topic 7: Digital education: Ethical and effective use of generative Artificial Intelligence systems in education and training'

| Status | Opening date | Deadlines   | Funding type     | Keywords |
|--------|--------------|-------------|------------------|----------|
| Open   | 18 déc. 2024 | 27 mai 2025 | ERASMUS-LS       |          |
|        |              |             | ERASMUS Lump Sum |          |
|        |              |             | Grants           |          |

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#### **Description:**

Scope:

Projects under this priority will aim to foster broader organisational readiness and capacity of education and training institutions as well as more broadly to education and training systems through:

• Identify, map and analyse existing effective initiatives and areas in teaching, learning, and assessment at any level(s) of education and training where generative Artificial Intelligence (AI) systems are of particular use and benefit. Identify challenges as well as success factors for the deployment of generative AI.

• Develop, and pilot innovative approaches, methods, and practices of the use of generative AI systems in teaching, learning and assessment at any level(s) of education and training. Special attention should be paid to the ethical, effective, purposeful and pedagogically underpinned use of the technology.

• Produce guidelines and practical materials, as well as use cases on the critical use of generative AI systems in education and training practices that can be disseminated and easily implemented at organisational level. Those should be complemented with clear recommendations to inform further policy initiatives.

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### **5. HORIZON-SESAR-2025-DES-ER-03-WA2-1 (HORIZON-JU-RIA)** Research to help shape the future regulatory framework for a DES

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

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#### Description:

Expected Outcome:

To significantly advance the following development priority:

AR-1 Research to help shape the future regulatory framework for a Digital European Sky.

#### The expected outcomes are

Support the evolution of the future regulatory framework addressing the impact of automation on the human role, providing insight on the challenges and potential solutions to design AI and non-AI based automation tools.Contribute to a harmonised application of airspace classifications in Europe.Improve ATM safety developing applications of Data4Safety.

Specific requirement for this topic

Research activities carried out under this topic should always duly consider and assess the potential impact of the proposed regulatory evolutions on military aviation, in particular military operations and training. Scope:

1. Evolution of the human operator role and automation

The target vision presented in the ATM Master Plan and in the EASA artificial intelligence (AI) Roadmap entails a technological evolution that will transform the way air traffic services are provided: human operators will delegate a substantial number of tasks to the automation, and both together will form a human – machine teaming able to handle an increasing traffic demand more safely and efficiently.

The research requires a multidisciplinary approach, involving safety, human performance, legal, insurance, regulatory, etc. expertise and shall be use-case driven. The objective of this research is not the development of an ATM solution with a high level of automation but, building on one or more ATM solutions (use-cases) proposing automation level 3 or 4 (human supervision or human safeguarding) based on conventional deterministic algorithms (i.e., not based on artificial intelligence)[1] assess the evolution of the human operator role and automation.

Research shall develop a thorough state of the art of the HF impact on automation and mitigation methods that are applicable in ATM and propose standardized measurement methods to quantify the adverse impacts.

#### Research aims at identifying and analysing:

How the technological evolution (degree of automation and supervisory vs. executive role) impacts the nature and frequency of human operators' interventions/tasks, the required competencies, their states e.g., fatigue and subsequently their overall performance.Potential safety hazards related to the transition to an evolved human operator role, which might impact human operator cognitive skills and capabilities, and with the new role (e.g., specific to a supervisory role).The potential loss of sense of control by the human operator due to future technological developments, acknowledging the range of working environments and operational circumstances within Europe. The potential loss of sense of control might be related to a potential shift and further reduction of human operator tasks, resulting from future technological developments. Such a shift of human operator tasks might be expected but it is yet unclear into which direction supporting technologies develop on the medium and long-term and whether and how this might cause loss of sense of control.Joint cognitive systems and adaptative automation are promising developments, for which additional scientific studies are recommended because the maturity level

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and evidence for their effect on human operator workload and fatigue is still scarce. As these technological developments continue to evolve in the coming years, continued collaboration between researchers, technology developers, and regulatory bodies is recommended. ATSPs could find solutions to reduce the risk of drowsiness in two opposing directions: a) by reducing automation such that b ore-outs due to low task load are avoided, and b) by increasing automation such that, during certain periods, human operators could relax or could execute other tasks than monitoring to avoid fatigue later in their working session. Both directions have benefits and risks and are not yet fully addressed in research. Further research is therefore recommended to study these opposing approaches and address topics such as: Technological feasibility of (adaptive) automation that can intervene in ATC operations.(Operational) tasks to maintain human operator vigilance during periods low traffic demand.Means of optimal human operator engagement.

Research may consider meta-analyses and/or assessment of mitigation methods, and/or standardizing procedures, etc.

The research shall consider and complement the initial considerations of the "EASA ATCO Fatigue study" on the impact of new technologies on human operator workload and fatigue[2] as well as the EASA's approach on AI, as presented in the AI Roadmap[3]. On-going work performed by project IFAV3 on increased flexibility of human operator validations is also relevant.

The results of the research shall aim at providing factual scientific data that could substantiate intervention strategies (e.g., further rulemaking, implementation support, oversight, etc.) in the field of human operator training, competence, and fatigue management, as well as in relation with the introduction of new ATM/ANS functionalities.

The output of the research will support impact assessment and future decision making by EASA on the regulatory needs associated to the deployment of the solution. The assessment shall include the consideration of legal accountability in case of an incident.

#### 2. Research on human operator fatigue and rostering practices

The following research topics are proposed with the aim to further increase the knowledge and scientific evidence on human operator fatigue prevalence, causes and effects, and effective prevention and mitigation, and thereby support future decision-making by EASA. The research shall consider the "Study on the Analysis, Prevention and Management of Air Traffic Controller Fatigue"[2] published by EASA in May 2024:

Extend the scientific knowledge about the prevalence, causes and impact of human operator fatigue including a varied and representative sample of EU ATSPs and human operators (e.g., human operators of the oldest age group) in human-in-the-loop experiments (e.g., using simulator(s) or a highly controlled operational environment). These experiments shall: Further research to identify and propose recommended bracket values of the eight roster elements[5] maintaining the risk of human operator critical fatigue at low to moderate level; the bracket values should take into account and be correlated, if possible with traffic volumes and complexity, seasonal activities, and nominal and non-nominal (e.g. crisis) situations, beyond the results documented in the EASA study: collecting data during longer and more varied measurement periods (e.g. both summer and winter), targeting air traffic service providers (ATSPs) with specific schedules, work procedures, and variation in traffic volumes and complexity. If these criteria have an influence on human operator critical fatigue, an associated fatigue risk index should be provided. Further research into the correlation and cross effects of the 8 mandatory parameters (e.g. number of maximum consecutive days vis-à- vis maximum hours per duty) as well as on the time needed to reduce/dissipate critical fatigue risks.Further research on the various national labour laws in the EU and their impact on the rostering practices.As far as possible, based on the above-mentioned research, identification of a methodology to calculate human operator staffing levels in ATSPs. Investigate the impact on work-life balance and human operator fatigue of rostering schemes (e.g., days in advance rostering is published, flexibility for human operators to express shift preferences (e.g., to adapt to the individual circadian rhythms of morning persons / night owls), shift swapping between human operators / centralised shift swapping between individual human operators and the system, etc.). Investigate how the results of this study could be used within rostering and fatigue management systems. Further collect data on the actual content of working hours in the EU ATSPs and confirm the share of operational and non-operational duties. Consider the nature of non-operational duties and measure the effect of these duties on fatigue and performance. Propose a definition of working hours and what it should or not include in view of the impact on fatigue. Finally, assess the effect of the rostering period scheme, the number of working hours per rostering period (and number of working hours per week (or month)) on (cumulative) human operator fatigue and determine the maximum number of working hours per rostering period to recommend. Consider the nature of non-operational duties and measure the effect of these duties on fatigue and performance. Assess the impact of new technologies on fatigue in an objective manner, while controlling for other factors (such as rostering and workload). Provide an updated assessment of current developments in fatigue detection technologies. Develop objective non-intrusive new fatigue monitoring technologies (e.g., wireless electrode electroencephalogram (EEG), speech analysis and webcam-based

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eye tracking, etc.) to be used in the ATC operational environment. Research shall take into consideration ethical and data privacy issues, particularly in the context of general data protection regulation (GDPR) guidelines. Future developments in fatigue detection and/or monitoring should therefore address the balance between leveraging the benefits of advanced monitoring technologies and safeg uarding individual privacy by integrating robust data protection measures, ensuring compliance with regulations, and addressing ethical considerations to gain acceptance within the ATC community. As these technologies continue to evolve, ongoing collaboration between researchers, technology developers, and regulatory bodies is strongly recommended.Provide recommendations for the update of the SESAR human performance assessment methodology used by R&I projects in the SESAR programme to improve the consideration of fatigue at various stages of development and implementation of new technologies, including the assessment of the impact on fatigue of new concepts that make human operator role more passive/monotonous, for the manufacturers, the ATSPs and competent (oversight) authorities; in this regard assess the possible link with the Research project on the methods to evaluate the performance and impact of ATM/ANS ground equipment on human operator fatigue.

Proposals shall define mechanisms for guaranteeing the absence of conflict of interests.

The results of the research shall aim at providing factual scientific data that could substantiate intervention strategies (e.g., further rulemaking, implementation support, oversight, etc.) in the field of human operator fatigue management and working practices. Note that there is on-going work performed by project IFAV3 on increased flexibility of human operator validations.

3. Methods to evaluate safety requirements of ATM/ANS ground equipment and determine appropriate assurance levels

The lack of harmonised and recognised methods for ensuring the safety and interoperability of ATM/ANS system and constituents (ATM/ANS equipment) (e.g., identification of failure conditions, definition of hardware and software requirements, safety assurance of commercial of the shelf (COTS) equipment, etc.) has resulted in a significant number of different approaches applied by the equipment manufactures and air navigation service providers (ANSPs). Although there are industry standards and methods available for determining the appropriate safety assurance, these standards are not fully compatible with each other.

Furthermore, modern ATM/ANS equipment and those envisaged to by the ATM Master Plan are to make significant use of data through the application of virtual systems (e.g. through application of cloud computing).

With the transition to the EASA framework for attestation of ATM/ANS equipment (Commission delegated regulation (EU) 2023/1768 of 14 July 2023), there is a need to ensure a common approach and understanding of the safety requirements, liability aspects, assurance level and that harmonised methods are applied.

Research shall aim at providing data and information to determine:

Certification characteristics and performance of hardware platform cloud computing and COTS solutions/equipment. How best to ensure the suitability for use of COTS equipment or constituents. Principles, assurance methods, and safety considerations to be applied in guaranteeing computing platform, virtual systems, and software applications provide their performance and safety targets. A methodology applicable to ATM equipment to determine "failure conditions". Shared liability principles for assurance of certified equipment being used in a more highly automated operating environment. Principles, methods, and safety considerations to determine software assurance level (SWAL) and hardware assurance level (HWAL).

The research results will support EASA rulemaking activities (e.g., RMT.0744[6]) to further develop and complete the initial set of detailed specifications (DS-GE[7] and DS-SoC[8]) (see ED Decision 2023/015/R[9]). The resulting changes to the detailed specifications will enable the application of the appropriate safety requirements, harmonise assurance methods, and clarify the certification and declaration of ATM/ANS equipment, thus ensuring the safety, interoperability and functioning of the Single European Sky and provide a common approach and understanding of the safety requirements.

Research shall consider the on-going standardisation activities by international committees under EUROCAE WG 117 and WG 127 aiming at developing Means of Compliance to address the above challenges.

4. The application of airspace classification in Single European Sky airspace

Through the application of SERA.6001 Classification of airspaces of the Annex to Regulation 923/2012, a common definition of the airspace

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classification has been implemented. However, the designation by the Member States has resulted is an unharmonized application which leads to flight inefficiencies, decreased safety and difference in service expectations when conducting operations in similar airspace within different Member States.

Research shall provide the data and information (including U-space implementation), to determine: The distribution of the application of airspace classification in Member States airspace and the context of such application. The research must address in particular the implementation of class G airspace across Europe.A reasoned framework (including a set of parameters based on traffic demand) to support a harmonised application of the airspace classifications.

The research should consider current traffic demand and future traffic forecast, considering (in particular) VFR and IFR electric aircraft as per the EASA certification projections, as well as very low level (VLL) operations.

A harmonised application of airspace classifications in Europe will support the safe and effective operations by commercial and large aircraft and general aviation. Research shall provide the required evidence and initial inputs to define an intervention strategy (e.g., further rulemaking, implementation support, etc.) to define the classification application conditions in support of a Single European Sky.

5. Development of guidelines for the design of future artificial intelligence (AI) systems

Research shall aim at supporting the evolution / update of EASA guidelines for the development of AI enabled systems in ATM, including feedback on the effects of conformance, transparency and complexity and other challenges associated to the design of future AI systems (e.g., trade-offs between privacy and transparency, trustworthy AI approaches). Research shall take as starting point the issue 02 of the EASA AI concept paper[10].

Research shall identify concrete applications of EASA guidelines and define the appropriate activities, not only human-in-the-loop simulations considering controller trust, acceptance, workload and human/machine performance but also new approaches for validation, verification, and testing of AI applications, specifically for safety critical applications (e.g., developing an agile validation methodology and data centric security capabilities for AI systems to promote their reliability, increase trust on AI, and maintain a competitive edge in today's rapidly evolving technological landscape).

Close coordination with EASA is expected, to ensure complementarity and consistency with EASA activities on the following areas: Trustworthiness: capability to keep AI-based systems with relatively high cyber-security protection. Support the definition of the requirements and needs for input/output verification (related to trustworthiness in the framework of Structured Transparency) in the ATM context in support of the EASA certification process descriptions. Validate and further develop requirements and potential solutions with a co-joint analysis together with EASA and other operational experts. Clarify some of the challenges faced by EASA (e.g., to define the system requirements, processes, and tools that are needed to perform the validation and certification process).Learning Assurance: including the consideration of realistic operational cases in realistic operational conditions and new machine learning (ML) techniques. Need to develop specific assurance methodologies to deal with learning processes.AI explainability, which goes beyond the ML techniques to extract information from the models and includes the interactions with other systems and with the human operators (human factors). Research may help to clarify which requirements and processes the target AI/ML system should comply with to be certifiable for operations.AI Safety case: discussing with EASA and other safety experts about the needs and requirements of a concrete safety-case can help to clarify and support the development the EASA guidelines for certification.

The concept of safety critical levels needs to be further developed for AI applications in ATM. Research covers the definition and analysis of safety-related use cases for different safety level assurances. These safety levels may imply either the adaptation of current software (SW) verification methods or the development of new ones to guarantee the safe of operation of AI in ATM.

Research shall consider the on-going standardisation activities by EUROCAE WG114 – SAE G34, which is a joint standardization initiative to support Artificial Intelligence revolution in aeronautics.

6. Enhancing robustness and reliability of machine learning (ML) applications

Research aims at enhancing machine learning (ML) applications to ensure they are technically robust, accurate and reproducible, and able to deal with and inform about possible failures inaccuracies and errors. Research aims at developing potential solutions to address this

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challenge, which shall include/refer to the EASA methodologies for certification of AI in aviation. The research must be focused on the application of ML to ATM, by either leveraging existing ML techniques or by developing new ML techniques to address the specific challenges. Research shall consider the results and recommendations reported in the machine learning application approval (MLEAP) final report[11].

#### The scope may address:

Further the research on "generalisation capabilities of ML models and constituents", as the MLEAP final report indicates the need for further work (the set of methods experimented on use cases do not provide satisfactory generalisation bounds and other methods should be further investigated). Verification methods of robustness for machine learning (ML) applications. Due to the statistical nature of machine learning applications, they are subject to variability on their output for small variations on their input (that may even be imperceptible by a human). Research aims at proposing new methods to verify the robustness of machine learning applications, as well as to evaluate the completeness of the verification. Standardised methods for evaluation of the operational performance of the machine learning (ML). Research addresses the definition of reference methods and metrics to assess the accuracy or error rate of ML applications. Application of transfer learning and data augmentation techniques for the development of the proposed applications, thus guaranteeing their robustness. In addition, these systems would be continuously validated using ML Ops methodology and explainability techniques, to ensure system performance and detect as early as possible if concept drift is occurring. Identification, detection, and mitigation means of bias in ML applications. Machine learning applications are subject to bias, which can compromise the integrity of their outputs. One of the most challenging aspects when collecting, preparing, or using data, is the capability to identify, detect and finally mitigate adequately any bias that could have been introduced at any time during the data management and/or of the training processes. Research aims at developing potential solutions to address this challenge.ML/AI-based systems must be designed, deployed and executed while considering cyber-security aspects to prevent, detect, mitigate and respond to attacks and ensure that the system is cyber-resilient. Peculiarity in threat models, risk assessment, and monitoring of ML/AI systems must be considered.

7. Support to the certification of novel ATM (AI-based and non-AI-based) systems that enable higher levels of automation

The objective of this research element is to address issues related to the certification of:

Novel AI-based ATM systems that enable higher levels of automation (level 3 and above, which corresponds to EASA AI levels 2B and above). Novel non-AI based ATM systems that enable higher levels of automation (level 3 and above).

Research will address solutions, methods, etc. that could support and harmonise certification of innovative ATM systems based or not on machine learning or artificial intelligence techniques (e.g., scenario-based testing, reinforcement learning for control systems, etc.). It is expected that proposals define a holistic approach to address this challenge considering not only technical aspects of the certification but also legal and regulatory aspects including privacy. Research may explore and assess potential approaches that could be applied for the certification of automation and that allow to demonstrate the safety of automation during nominal and non-nominal conditions. Of particular interest is to show how safety can be ensured even if not all situations and variations of parameters can be anticipated during the design phase. Proposals may apply uncertainty quantification to address this issue. Research may also address the specific challenges of certification of automation that can adapt its behaviour to changes of the environment over time. Research activities shall consider other initiatives developing safety of life systems that may have different approaches to certification and review their applicability to ATM (e.g., EGNOS). Research shall consider the work performed by project HUCAN.

See automation levels as in the ATM Master Plan in the section on general principles.

#### 8. Development of a framework to achieve effective Human-AI Teaming

Based on the published EASA Artificial Intelligence (AI) Roadmap 2.0[12], the issue 02 of the EASA AI concept paper[10] was published. This guidance document develops a novel layer of AI trustworthiness guidance related to Human Factors for AI, which is necessary to manage the approval of Level 2 AI applications, which encompasses (Human-AI Teaming).

Such applications bring the level of assistance from the AI-based systems to the Human end-user one level beyond, enabling automatic decision-making or action implementation, which was not foreseen in the Level 1 AI applications (Human assistance and augmentation).

When considering an AI-based system as a part of a team, rather than simply a tool capable of limited actions, the need for a framework for improving the design of AI-based systems to enhance the overall success of Human-AI teams becomes obvious. A failure to consider the

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needs of the many air traffic controllers, pilots, flight dispatchers, flow managers, etc. who are responsible for successful operations will result in AI technologies that eventually fail to provide the necessary high levels of performance and may instead cause inefficiencies and safety concerns.

The design of AI-based systems for Human-AI teams needs to incorporate several highly interrelated considerations. These include designing the AI system to support not only task work, but also teamwork. These interrelated considerations include considerations about Human-AI team performance and processes, AI-based system situation representation, shared situational awareness, human team member training needs, Human-AI interaction methods, interface, AI operational explainability and Human-System Integration processes, measures, and testing.

Research aims at investigating concrete and feasible means of compliance for the new layer of Human Factors objectives and how compliance could be assessed including a definition of KPIs for performance in new roles for human, non-human, and hybrid teams. The research project could also lead to complement anticipated means of compliance for the Human-AI Teaming.

Research may include the creation of frameworks / methods for training AI-based systems together with humans, to be able to include in the objective functions notions of collaboration or KPI related to team success, and not only individual goals. The absence of standardised testbeds in AI-based ATM research fragments it and prevents truly collaboration between the research actions, even more so in the domain of Human-AI Teaming.

The research shall take as a starting point one or more use cases of application of automation level 2 to ATM that do not use AI and are already at a maturity level TRL6 or above and investigate the potential introduction of AI to enhance the performance of the Human-AI team.

Research should demonstrate a clear relationship between the human factors objectives and implementation in the wider socio-technical system (e.g., training, procedures, competence certification, etc.).

Along with the research, at least one real-scale aviation use case per domain (covering at least ATM/ANS and airworthiness) should be developed to demonstrate the effectivity and usability of the proposed methods and tools.

The expected short-term benefit is to support certification and approval processes by identifying concrete means of compliance to the Human-AI Teaming objectives of EASA guidance for AI applications (AI Level 2 and 3A as defined in EASA AI Roadmap), with a specific focus on AI Level 2A and AI Level 2B. Transitions between levels should also be considered.

The expected medium-term benefit is to enable advanced type of automation in different domains covered by the EASA Basic Regulation (Regulation (EU) 2018/1139[14]), with enhanced Human-AI teaming capabilities of AI-based systems.

9. Explainable Artificial Intelligences (XAI)

AI explainability is the capability to provide the human with understandable, reliable, and relevant information with the appropriate level of detail and with appropriate timing on how an AI/ML application produces its results.

Applicable EASA guidance[15], which shall be considered by the research on this topic distinguishes between development & amp; post-ops explainability (driven by the needs of stakeholders involved in the development cycle and the post-operational phase) and operational explainability, which refers to the need to provide end users with 'understandable' information on how the AI/ML-based system came to its results.

The research shall address the following aspects:

Elaborate a state of the art review to evaluate the progress made on XAI by several research groups (e.g., DEEL (dependable, explainable and embedded learning)).Based on the state of the art review identify and develop further axes of research.Investigate the "relevance property" highlighted in machine learning application approval (MLEAP) final report[11]. The impact of inputs on outputs is an important consideration to promote when trying to explain complex models such as neural networks (NN). Similarly for control related applications (e.g., reinforcement learning), the "reachability property" from the same MLEAP report may also be of interest.Despite the inherent case by case

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nature of compliance methods to explainability objectives, it is important to research a common baseline of methods/tools for specific groups of AI/ML applications (e.g., type of technology, type of application, dimensionality, etc.). The objective of this research is to improve transparency of automated systems in the ATM domain investigating methods based on

Explainable Artificial Intelligence (XAI) in operational use cases e.g., predicting air traffic conflict resolution and delay propagation, validating the robustness and transparency of the system, etc. Research shall consider the output of project ARTIMATION and MAHALO.

#### 10. Innovative methodologies for ATM safety, security, and resilience

Research aims at developing methodologies (or evolution of existing ones) for safety, security and resilience that will contribute to ensure that ATM is robust against ever-evolving risks, threats, and disruptive events in the physical and cyber worlds in a novel ecosystem (e.g., enabled by automation level 3 and above). Moreover, research shall consider how novel virtualized and distributed ATM service architecture can be cyber-resilient and collaborate to enhance the overall security approach. New and disruptive technologies, operations, and business models to ensure ATM is resilient against internal and external threats, including health, natural disasters, terrorism, and criminal activity. Research shall ensure coordination with EASA. Research shall consider the work performed under projects SEC-AIRSPACE, FARO and FCDI.

#### 11. Applications of Data4Safety

Data4Safety (also known as D4S) is a data collection and analysis programme of the European Union Aviation Sector that will support the goal to ensure the highest common level of safety and environmental protection for the European aviation system.

The programme aims to provide a big data platform and analysis capability at European scale and level, including a structural link with ECCAIRS2 that enables analytics and insights from the European Central Repository safety data (ECR as per Regulation (EU) 376/2014[17]). This means collecting and gathering all data that may support the management of safety risks at European level including safety reports (or occurrences), flight data (i.e., data generated by the aircraft via the flight data recorders), surveillance data (air traffic data), weather data, etc. As for the analysis, the programme's goal is to help to "know where to look" and to "see it coming" as well as to support data-driven changes at system level. In other words, it will support the performance-based environment and set up a more predictive system. More specifically, the programme will allow to better know where the risks are (safety issue identification), determine the nature of these risks (risk assessment) and verify if the safety actions are delivering the needed level of safety (performance measurement).

Research aims at defining, developing, validating, and assessing potential future applications / use cases of the data collected under Data4Safety Programme, which could be later integrated during the next stages of the D4S development phase. The goal is to improve the overall capacities of the European Union aviation system to manage risks and support data-driven changes with adapted aviation intelligence, by developing the capability to discover vulnerabilities in the system across terabytes of data.

The focus should be on the utilization of training data for ATM human operators and pilots in correlation with aviation data derived from inservice operations, rotorcraft, general aviation, and drones' operations and in the field of environment.

#### 12. Automation of the security risk assessment (SecRA) process

Security risk assessment is a resource-intensive, time-consuming process which incorporates the identification of assets, vulnerabilities, threats and threat scenarios, the evaluation of risk, and the selection of security controls to meet organisational security objectives. There is currently a global shortage of cybersecurity practitioners who can do this work, and this will remain the case for the next few years.

New European regulations (Part-IS) mandate information security management system (ISMS) requirements on aviation organisations and authorities, many of which have previously not been subject to such requirements and may not have implemented an ISMS or carried out security risk assessments in the past. The main objective of Part-IS is to address information security risks which may have an impact on safety, so mechanisms must also be in place to support the coordination of the aviation safety and security disciplines.

Automating the security risk assessment (SecRA) process would assist organisations and authorities to meet the needs of Part-IS by easing the development of SecRAs while reducing the resources required.

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#### Possible phases in achieving this:

The automated update and maintenance of the required catalogues in an existing SecRA (e.g., assets, threats, vulnerabilities, and controls) from established sources of such data. The automated generation of reports on the impact of catalogue updates on an existing SecRA (e.g., describing which parts of the SecRA are potentially impacted by a new threat, a new vulnerability, a modified control, etc.). The development of a new SecRA, or the modification of an existing SecRA, by an information security specialist supported by an intelligent assistant. The autonomous development of a new SecRA, or the modification of an existing SecRA, by an AI agent.

Part-IS refers to ISO/IEC 27001:2022 as a suitable standard, so ISO/IEC 27005, and a compliant tool, may be a suitable approach to apply for SecRA development.

In addition, the utilization of Intelligent Assistants (IAs) could facilitate Human/AI teaming in security and safety risk Assessment activities, such as in the following areas:

Providing support to safety and security experts in assessing the potential impacts of security incidents on safety, and in the optimal selection of security controls. Assessing the potential impact of security controls on safety - and vice-versa.

#### 13. Climate and environmentally driven route charging

Research shall address the potential of climate and environmentally driven route charging, with new mechanisms for charging airspace users to incentivise minimum climate impact. Route charging will reward those who avoid volumes of airspace with a high climate impact and disincentivise flight planning through high demand sectors / flight altitudes except where it optimises environmental benefit overall, while being cost neutral to airspace users and passengers on average. Added capacity in the "greener" volumes of airspace enabled by reduced vertical separations limits necessary flight plan modifications, furthering acceptance of the approach. Note that there is on-going work on this research element under projects Green-GEAR and AEROPLANE.

[1] Note in this element AI algorithms are excluded in order to focus the research on the challenges posed by automation, rather than on the challenges posed by AI. AI challenges are covered in another element.

[2] https://www.easa.europa.eu/en/domains/air-traffic-management/atmans-workforce-air-traffic-controller-%28ATCO%29-fatigue.

[3] EASA Artificial Intelligence Roadmap 2.0 published - A human-centric approach to AI in aviation | EASA (europa.eu)

[4] https://www.easa.europa.eu/en/domains/air-traffic-management/atmans-workforce-air-traffic-controller-%28ATCO%29-fatigue.

[5] Maximum consecutive working days with duty (days), maximum hours per duty period (hours), maximum time providing air traffic control service without breaks (minutes), ratio of duty periods to breaks when providing air traffic control service, minimum duration of rest periods (hours), maximum consecutive duty periods encroaching the night-time (days), minimum rest period after a duty period encroaching the night-time (hours) and minimum number of rest periods within a roster cycle.

[6] https://www.easa.europa.eu/en/document-library/terms-of-reference-and-rulemaking-group-compositions/tor-rmt0744

[7] Declaration specifications and AMC and GM for ATM/ANS (ground) equipment.

[8] Detailed specifications for ATM/ANS equipment subject to statement of compliance.

[9] ED Decision 2023/015/R - Conformity assessment of ATM/ANS equipment | DS-GE.CER/DEC — Issue 1 and DS-GE.SoC — Issue 1 | EASA (europa.eu).

[10] https://www.easa.europa.eu/en/document-library/general-publications/easa-artificial-intelligence-concept-paper-issue-2

[11] https://www.easa.europa.eu/sites/default/files/dfu/mleap-d4-public-report-executive\_summary\_expanded-issue01.pdf

[12] https://www.easa.europa.eu/en/document-library/general-publications/easa-artificial-intelligence-roadmap-20

 $\label{eq:constraint} [13] \ https://www.easa.europa.eu/en/document-library/general-publications/easa-artificial-intelligence-concept-paper-issue-2$ 

[14] https://www.easa.europa.eu/en/document-library/regulations/regulation-eu-20181139

[15] https://www.easa.europa.eu/en/document-library/general-publications/easa-artificial-intelligence-concept-paper-issue-2

[16] https://www.easa.europa.eu/sites/default/files/dfu/mleap-d4-public-report-executive\_summary\_expanded-issue01.pdf

[17] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014R0376

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### **6. VILNIUS TECH MERIT Project Targeted Scholarship Call ()** VILNIUS TECH MERIT Project Targeted Scholarship Call

| Status                           | Opening date | Deadlines    | Funding type | Keywords |  |
|----------------------------------|--------------|--------------|--------------|----------|--|
| Open                             | 11 août 2024 | 15 oct. 2025 |              |          |  |
| URL in Kaila:                    |              |              |              |          |  |
| <u>Click here</u>                |              |              |              |          |  |
| Description:                     |              |              |              |          |  |
| Submission & evaluation process: |              |              |              |          |  |

MERIT Project Targeted Scholarship Award Procedure and Selection Rules at Vilnius Gediminas Technical University

1. The aim of the Targeted Scholarships (hereinafter referred to as SCHOLARSHIPS) is to increase the accessibility of master's studies developing advanced digital skills for European citizens and promote the growth of higher-level skills, equality and diversity in computer science.

2. The SCHOLARSHIPS are granted by the MERIT project. MERIT project is co-funded by the European Union under grant agreement No. 101083531. Up to 66500 euros are available to be distributed for the targeted scholarships at Vilnius Gediminas Technical University (hereinafter referred to as VILNIUS TECH).

3. The SCHOLARSHIPS can be awarded to persons (hereinafter referred to as APPLICANTS) who are citizens of the European Union (hereinafter referred to as the EU) studying in the MERIT project master's degree programs "Engineering of Artificial Intelligence" (state code 6211BX023) or "Management of Artificial Intelligence Solutions" (state code 6211BX024) (hereinafter referred to as the PROGRAMS) at VILNIUS TECH.

4. Procedures for awarding SCHOLARSHIPS.

4.1. At the end of admission to master's studies, information about the scholarship procedure is published on the website of VILNIUS TECH and other systems.

4.2. By August 1, the chairman of the study program committee contacts all accepted students and informs them about:

4.2.1. the possibility of applying for scholarships;

4.2.2. the criteria for awarding scholarships;

4.2.3. requirements for the student's application for a scholarship;

4.2.4. the time limits for submitting the application.

4.3. Applications are accepted until the 15th of October. APPLICANTS are required to submit all documents and information referred to 5.2

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paragraph and proving eligibility for scholarship.

4.4. The applications are accepted by VILNIUS TECH Department of Information Technologies.

4.5. Within 5 working days after the deadline for the acceptance of applications, the study program committees of the PROGRAMS assess the received applications, their suitability, award points according to the criteria set out in paragraph 5.3 and thus rank the APPLICANTS.

4.6. Each PROGRAM selects the best-ranked APPLICANTS, but only those who fully meet the SCHOLARSHIP requirements. Other applications are assigned to the reserve list and are reconsidered if any of the scholarship recipients refuse them or loses the opportunity to continue receiving it during their studies.

4.7. Within 5 working days of the meetings of the study programme committees, all applicants who have submitted applications are informed about the decisions taken in relation to their applications.

4.8. Students who have received SCHOLARSHIPS within 10 working days must:

4.8.1. sign a scholarship award agreement, which also specifies the consent to the processing of the student's personal data, for scholarship management and marketing purposes;

4.8.2. provide the bank details necessary for the transfer of the scholarship.

4.9. Students have the right to appeal about the results of the assessment, presenting aspects that they consider inappropriate in their assessment, factual errors in the assessment of the data provided. In the case of an appeal, the following procedure shall apply:

4.9.1. appeals are accepted by the study programme committee within 3 working days from the date of notification of the results of the assessment;

4.9.2. the appeal must be submitted in writing, indicating the specific places where the student's score was improperly assessed;

4.9.3. the study program committee must evaluate the appeal within 5 working days and inform the APPLICANT about its results;

4.9.4. if the inaccuracies indicated in the appeal are confirmed, they must be corrected and, accordingly, the order of award of the scholarship is updated.

4.10. In the event of a refusal of the SCHOLARSHIP, disagreement with the conditions or failure to provide the necessary data in a timely manner, the APPLICANT is not included in the list of scholarship recipients, and for the occupation of this scholarship, the next priority APPLICANT who is on the reserve list is contacted.

4.11. After all, scholarships have been awarded, but no later than the 15th of November, the final list of students who have received scholarships is published and their payment begins.

5. Requirements for students. Scholarship award criteria.

5.1. The main requirements that must be met when applying for SCHOLARSHIP:

5.1.1. to be an EU citizen – provide a copy of the identity document indicating nationality;

5.1.2. to study at Vilnius Gediminas Technical University in the Engineering of Artificial Intelligence (state code 6211BX023) or Management of Artificial Intelligence Solutions (state code 6211BX024) master's degree study program – to be included in the lists of full study students of these study programs.

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5.2. When submitting an application, the student must provide the following documents:

5.2.1. the application, in which he or she briefly indicates the motivation and plans, where the received scholarship will be used, how it will contribute to the scholarship program aim and students upskilling in advanced digital skills (mandatory);

5.2.2. a copy of the identity document showing the date of birth and nationality of the APPLICANT (mandatory);

5.2.3. a document showing the declaration of residence (mandatory);

5.2.4. copies of documents of links to data sources, illustrating APPLICANTS achievements (optional).

5.3. Criteria by which applicants' applications are ranked:

5.3.1. Ensuring equal condition for achieving advanced digital skills for region and big city citizens. All APPLICANTS  $x_A$  are divided into two categories, according to whether their declared place of residence is between the three largest cities in that country or not. Quantities are obtained, how many APPLICANTS are from the regions (having declared their place of residence not in one of the three largest cities in their residence country)  $x_{1,R}$  and how many live in one of the three main cities of the residence country  $x_{1,R}$  (for each country, the size of the city is defined by the number of inhabitants). Each APPLICANT living in the region is awarded a score  $x_{1,R}/x_A$ , and those living in one of the three main cities of the country are awarded a score  $x_{1,R}/x_A$ . The criteria weight is 2.

5.3.2. Promoting gender equality in computer science. All students studying in the PROGRAMS are divided into two categories, according to the gender indicated in their personal identity document. The quantities are obtained, how many men study in the programs in the current period  $x_P x_{(2,M)}$  and how many women are studying in the programs  $x_{(2,F)}$ . Each male applicant is given a score  $x_{(2,F)}/x_P$ , and a woman applicant is given a score  $x_{(2,M)}/x_P$ . The criteria weight is 2.

5.3.3. Developing advanced digital skills among people of different ages. All students studying in the PROGRAMS  $x_P$  are divided into two categories, according to age. The quantities of students under the age of 25 years  $x_{(3,Y)}$  and how many 25 years and older students  $x_{(3,O)}$  study in the programs in the current period. Every APPLICANT under the age of 25 is awarded a score  $x_{(3,O)}/x_P$ , and those 25 and older are awarded a score  $x_{(3,Y)}/x_P$ . The criteria weight is 1.

5.3.4. Promotion of gifted students. The entrance scores  $x_M$  of all students studying in the programs are evaluated and the lowest MIN( $x_M$ ) and highest MAX( $x_M$ ) competitive scores are selected. For each APPLICANT whose competitive score  $x_4$  is awarded a score ( $x_4$ -MIN( $x_M$ ))/(MAX( $x_M$ )-MIN( $x_M$ )). The criteria weight is 5.

5.3.5. Promotion of students contributing to society and personal development in the area of advanced digital skills. It is estimated how much in the last 3 years the APPLICANT has actively participated in various events related to advanced digital skills or their application. The following activities are scored:

5.3.5.1. up to 1 point - participation and achievement at the MERITHON event;

5.3.5.2. up to 0.75 points – participation and achievement in another hackathon-type event related to advanced digital abilities.

5.3.5.3. up to 0.75 points – the establishment of a start-up or company that provides services of competences requiring advanced digital skills or sells a product based on them;

5.3.5.4. up to 0.5 points – participation in MERIT or other courses related to the development of advanced digital competencies;

5.3.5.5. up to 0.5 points - participation in volunteering related to advanced digital skills.

If the APPLICANT has received scores for several activities, the maximum of them is used for the assessment, and not their cumulative sum. The criteria weight is 3.

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5.3.6. Elimination of economic barriers to study. According to the motivation given in the application and the justification for the need for financial support, the jury awards a score, from 0 to 1, based on the expediency and reasonableness of the need. The criteria weight is 2.

5.4. The scores obtained by the APPLICANT for each criterion are multiplied by the weight of that criterion and then added together. The maximum amount of points that an APPLICANT can score is 15 points.

5.5. According to the score each APPLICANT received, they are ranked in each program from the highest to the lowest scorer. This is how the queue of candidates for scholarships is formed, where up to 5 of the highest-ranked APPLICATIONS get the SCHOLARSHIP.

5.6. Students undertake to use the scholarship solely for the purpose of study:

5.6.1. reimbursement of tuition fees;

5.6.2. for the purchase of hardware or software necessary to study;

5.6.3. living and travel costs, necessary to assure the study availability;

5.6.4. acquisition of additional training or information sources, improvement of the necessary competencies;

5.6.5. other study-related expenses.

6. The procedure for paying scholarships to students.

6.1. The scholarship is paid every month of the academic year from the award of the scholarship until graduation or till the 1st of July 2026 (whichever comes first) if the student meets the requirements, i. e. does not satisfy any of the conditions referred in the 7.1 paragraph.

6.2. The scholarship is provided for the defined period of study and is paid in the following months:

6.2.1. in the first year of study in October-June,

6.2.2. in the second year of study in September-June.

6.3. The amount of the scholarship is 350 euros per month and it will be fixed for the scholarship period. During the whole scholarship period, one student cannot be awarded more than 10 820 euros from all MERIT project scholarships, what corresponds to the tuition fees in the PROGRAMS for a full 2-year study period..

6.4. By receiving this scholarship, the student does not lose the right to apply for and receive other scholarships, unless otherwise specified in them and double funding is not received in terms of scholarships, getting multiple funding for the same purposes.

6.5. Upon receive of other scholarships rather than MERIT project, the student should additionally provide a written explanation, justifying the absence of double funding inform of scholarships.

6.6. In case of double funding, the MERIT scholarship can be rejected or its size can be reduced, to meet the real expense and income from scholarships balance.

7. Termination of award and payment of scholarship. Redistribution of scholarships.

7.1. The award and payment of the scholarship shall be terminated if the student has completed at least one of the following actions:

7.1.1. discontinues studies;

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7.1.2. takes academic leave;

7.1.3. transfer to another study program;

7.1.4. does not pass at least one exam or fail the course during the scheduled semester;

7.1.5. violated the rules of ethics and academic honesty.

7.2. The student can terminate the receipt of the scholarship on his or her own will, for personal reasons. In this case, a written request should be submitted for the termination of the award and payment of the scholarship to the study program committee.

7.3. The award and payment of the scholarship to the student is terminated from the occurrence of the circumstances referred in the 7.1 and 7.2 paragraphs.

7.4. In the cases provided for, upon termination of the award and payment of scholarships to a student, the process of assigning that scholarship to another student for the remainder of the scholarship payment period shall be carried out.

7.5. The procedure and criteria for the redistribution of scholarships are analogous to those for their award, but several changes apply:

7.5.1. APPLICANTS for the redistribution of scholarships are evaluated within one month from the occurrence of the circumstances of termination of the scholarship to the student concerned, but not earlier than 10 working days after the fact of termination of the scholarship;

7.5.2. from the moment of termination of the scholarship, within 5 working days, the students of the relevant study program are informed about the opportunity to submit applications for the vacant scholarship;

7.5.3. from the moment the notice is sent to students, students can submit the necessary documents for applying for the vacant scholarship within 5 working days;

7.5.4. in the assessment of 5.3.5. criteria, it is not the entrance score that is assessed, but the weighted average of the subjects of study in the master's program being studied;

7.5.5. the study programme committee assesses all applications within 5 working days and informs students about the results of the evaluation of applications within the next 5 working days.

Further information:

Regarding questions, related to the call and MERIT studies at Vilnius Gediminas Technical University, the main contact is Simona Ramanauskaitė (e-mail. simona.ramanauskaite@vilniustech.lt).

Task description:

Students undertake to use the scholarship solely for the purpose of study:

- reimbursement of tuition fees;

- for the purchase of hardware or software necessary to study;

- living and travel costs, necessary to assure the study availability;

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- acquisition of additional training or information sources, improvement of the necessary competencies;

- other study-related expenses.

Visibility of the scholarship benefits should be done on scholarship receive.

Expected duration of participation:

The scholarship period ranges from 1 to 10 month, depending on application time and conditions.

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# 7. VILNIUS TECH MERIT Project Excellence Scholarship and Mobility Grant Award Call ()

### VILNIUS TECH MERIT Project Excellence Scholarship and Mobility Grant Award Call

| Status        | Opening date | Deadlines    | Funding type | Keywords |
|---------------|--------------|--------------|--------------|----------|
| Open          | 19 août 2024 | 30 juin 2026 |              |          |
| URL in Kaila: |              |              |              |          |

<u>Click here</u>

#### Description:

Submission & evaluation process: MERIT Project Excellence Scholarship and Mobility Grant Award Procedure and Selection Rules at Vilnius Gediminas Technical University

1. The aim of the excellence scholarships and mobility grants (hereinafter referred to as SCHOLARSHIP) is to promote the practical application, publicity and research of advanced digital skills among European citizens, thereby fostering innovation and the activity and mobility of those who can create it.

2. The SCHOLARSHIPS are granted by the MERIT project. MERIT project is co-funded by the European Union under grant agreement No. 101083531. Up to 21000 euros are available to be distributed for the excellence scholarships and mobility grants at Vilnius Gediminas Technical University (hereinafter referred to as VILNIUS TECH).

3. The SCHOLARSHIPS can be awarded to persons (hereinafter referred to as STUDENTS) who are citizens of the European Union (hereinafter referred to as the EU) studying in MERIT project master's degree programs of Engineering of Artificial Intelligence (state code 6211BX023) or Management of Artificial Intelligence Solutions (state code 6211BX024) (hereinafter referred to as the PROGRAMS) of Vilnius Gediminas Technical University (hereinafter referred to as VILNIUS TECH).

#### 4. Procedures for awarding SCHOLARSHIPS.

4.1. Information is published on the VILNIUS TECH website and other systems information about the possibilities for students studying in the programs to receive one-time scholarships for their results and activities performed, as well as available funding for student mobility.

4.2. During the study period, each student can write an application (hereinafter referred to as the APPLICATION) to the study program committee and apply for funding dedicated to:

4.2.1. mobility opportunities;

4.2.2. promotion for the results achieved.

#### 4.3. The applications are accepted by VILNIUS TECH Department of Information Technologies.

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4.4. In the first week of each month, the Programme Study Programme Committee considers the APPLICATIONS received and, on the basis of the criteria for the evaluation of applications, makes decisions on the satisfaction of students' APPLICATIONS.

4.5. STUDENTS are informed about the results of the consideration of the APPLICATION within 5 working days after the decision is made.

4.6. STUDENTS who were granted the scholarship application, within 10 working days must:

4.6.1. sign a scholarship award agreement, which also specifies the consent to the processing of the student's personal data, for scholarship management and marketing purposes;

4.6.2. provide the bank details necessary for the transfer of the scholarship;

4.6.3. provide other documents or information related to the award of the scholarship.

4.7. Students have the right to appeal about the results of the assessment, presenting aspects that they consider inappropriate in their assessment, factual errors in the assessment of the data provided. In the case of an appeal, the following procedure shall apply:

4.7.1. appeals are accepted by the study programme committee within 3 working days from the date of notification of the results of the assessment;

4.7.2. the appeal must be submitted in writing, indicating the specific places where the student's score was improperly assessed;

4.7.3. the study program committee must evaluate the appeal within 5 working days and inform the APPLICANT about its results;

4.7.4. if the inaccuracies referred to in the appeal are confirmed, they must be corrected and, accordingly, the fact of the award of the scholarship resumed.

4.8. In the event of a refusal of the SCHOLARSHIP, disagreement with the terms or failure to provide the necessary data in a timely manner, the APPLICATION is recorded as obsolete and the scholarship is no longer awarded.

5. Requirements for those who can submit an application for the scholarship.

5.1. The main requirements that must be met when applying for SCHOLARSHIPS:

5.1.1. to be an EU citizen – provide a copy of the identity document indicating nationality;

5.1.2. to study at Vilnius Gediminas Technical University in the Engineering of Artificial Intelligence (state code 6211BX023) or Management of Artificial Intelligence Solutions (state code 6211BX024) master's degree study program – to be included in the lists of full study students of these study programs;

5.1.3. must have no academic debts at the time of applying and receiving the scholarship.

5.2. Additionally, student's activity during the studies is taken into account when evaluating scholarship applications. Students who are rated by teachers in specialized subjects of study as active during lectures have an advantage over inactive students. This fact determines not the size of the scholarship, but the ranking of applications for scholarships.

6. Mobility grants and their requirements.

6.1. Mobility grants can be awarded to cover student trips aimed at acquiring and demonstrating additional competencies, promoting the results achieved during studies and the PROGRAM.

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6.2. When writing applications for mobility scholarships, the application must contain the following information and provide the following documents:

6.2.1. the purpose of the mobility and the planned results;

6.2.2. a link to the event or document indicating all the information about the event (date, duration, type, etc.) and its organizers (country, address, contact details, etc.);

6.2.3. detail the mobility costs planned or incurred and the proportion of their reimbursement requested (which costs are requested and to what extent).

6.3. Mobility scholarship applications shall be considered taking into account the following criteria:

6.3.1. the funding allocated must not overlap with the funding of other programmes, such as ERASMUS+;

6.3.2. for studies or traineeships in another higher education institution or institution, applications are considered only if the STUDENT has already submitted an application in the ERASMUS+ programme, but due to lack of funding, his/her application was not granted or the budget is not enough;

6.3.3. mobility must contribute to the development of advanced digital skills in the EU and/or the visibility of the MERIT project;

6.3.4. the mobility grant requested corresponds to the typical costs for this type and duration of travel, the budget is economically justified;

6.3.5. The student's mobility will have a positive impact not only on the student but also on other students of the PROGRAM, the community of the MERIT project.

6.4. The following types of trips are encouraged, for which a higher priority is given when assessing mobility applications:

6.4.1. participation in a scientific international conference, presenting the results achieved during the studies;

6.4.2. participation in international events (hackathons, competitions) representing the PROGRAM and the MERIT project.

6.5. In case of multiple applications and limitation of the budget, the priority is given to students, who had no mobility grants before, or the granted mobility grant was lower.

6.6. The amount of mobility grants from MERIT project may not exceed EUR 1500. In the case of higher costs, the possibilities of co-funding from other sources are investigated and combined to cover the full costs. The applicant should provide a written explanation what funding sources and amounts will be used for which mobility cost component, assuring no double funding will be done and at the same time, the received funding will be enough to implement the mobility plan. The request is granted only after it is satisfied that the fact of mobility will be ensured and there will be no double funding.

6.7. The STUDENT whose request has been granted shall sign a contract for the satisfaction of the application, in which he agrees that:

6.7.1. the funding can be used within 9 months from the date of satisfaction of the application, but no later than the end of the STUDENT's studies or September 1, 2026 (depending on what will be sooner);

6.7.2. the costs of mobility shall be paid by the students and he or she will provide the invoices received and the documents proving their payment to the study programme committee, which shall reimburse the costs actually incurred within 30 calendar days by transferring to it an appropriate amount of money.

6.8. If a STUDENT's mobility application is granted but before the student is used for a year of study, academic leave or other breaks in

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studies, the satisfaction of the mobility grant application is also invalid.

7. Excellence scholarships and requirements for them.

7.1. Excellence scholarships can be awarded for outstanding student achievements.

7.2. When submitting applications for excellence scholarships, it is necessary to indicate in the application the following information and provide such documents:

7.2.1. what exceptional results the student has achieved and provide documents proving this;

7.2.2. when these results were achieved;

7.2.3. how these results relate to the PROGRAMME and the MERIT project;

7.3. Applications for excellence scholarships shall be considered taking into account the following criteria:

7.3.1. the student's achievements are directly related to the vision for the development of advanced digital skills in the EU, the objectives of the PROGRAMME and/or the MERIT project;

7.3.2. the student's achievements contributed to the visibility of the PROGRAM and the MERIT project.

7.4. The study program committee estimates the criteria values, mentioned in paragraph 7.3 for each application, providing justification of the decision. Only applications, which meet both of the criteria are considered further.

7.5. Excellence scholarships can be awarded to the maximum extent possible, depending on their type, participation and influence:

7.5.1. up to 1000 euros – publication of a scientific article in the Web of Science referenced scientific journals with IF (not counting MDPI journals), referring to VILNIUS TECH as an affiliation. The number of co-authors and first author is taken into account – the maximum scholarship amount is divided by n+1, where n is the number of authors, excluding the student and his or her supervisor; dividing by 2 if the applicant is not the first author;

7.5.2. up to 500 euros – publication of a scientific article in the Web of Science referenced scientific journals without IF or in MDPI journals with IF, referring to VILNIUS TECH as an affiliation. The number of co-authors and first author is taken into account – the maximum scholarship amount is divided by n+1, where n is the number of authors, excluding the student and his or her supervisor; dividing by 2 if the applicant is not the first author;

7.5.3. up to 250 euros – publication of a scientific article in other scientific journals, conference materials, as an affiliation referring to VILNIUS TECH. The number of co-authors and first author is taken into account - the maximum scholarship amount is divided by n+1, where n is the number of authors, excluding the student and his or her supervisor; divided by 2 if the applicant is not the first author;

7.5.4. up to EUR 100 – preparation of a scientific oral presentation or poster at a scientific conference. The number of co-authors and the first author are taken into account – the maximum scholarship amount is divided by n+1, where n is the number of authors, excluding the student and his or her supervisor; dividing by 2 if the applicant is not the first author;

7.5.5. up to 500 euros – for the winners of international competitions or hackathons representing VILNIUS TECH and/or MERIT project. The size of the team is taken into account – the maximum scholarship amount is divided by n+

1, where n is the number of additional team members;

7.5.6. up to 100 euros – active (not only in the role of an observer) participation but not winning in competitions or hackathon events,

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representing VILNIUS TECH and/or MERIT project. The size and achievements of the team are taken into account – the maximum scholarship amount is divided by n+1, where n is the number of additional team members, as well the amount can be reduced by some specified ration if the participation was fragmented or not contributing to the MERIT project visibility and aims;

7.5.7. up to 1000 euros – a start-up was founded, on the basis of a master's thesis. The quantity of the founders of the start-up and potential of it are taken into account – the maximum scholarship amount is divided by n+1, where n is the number of additional team members, as well the amount can be reduced by some ratio, if the start-up funding is less than 10000 euros or the area is not directly related to advanced digital skills and MERIT project aims;

7.5.8. up to EUR 1000 – other achievements in studies, science and publicity, taking into account the contribution to the development, coverage of advanced digital skills and innovations, the visibility and further development potential of the PROGRAMME and/or MERIT project.

7.6. The STUDENT whose application for scholarship has been granted shall sign a contract for the satisfaction of the request, which stipulates that:

7.6.1. the student will indicate all the bank account details relevant to the transfer of money;

7.6.2. the student's achievements will be publicized in the public media;

7.6.3. the student ensures that the achievements were obtained as a direct result of the PROGRAM or MERIT project;

7.6.4. the excellence scholarship will be transferred to the student within 30 calendar days after signing the excellence scholarship satisfaction agreement, but no later than before his or her graduation or September 1, 2026 (depending on what will be first).

8. Restrictions on the receipt of scholarships.

8.1. During one semester, a student can submit multiple applications for scholarships, but the SCHOLARSHIP cannot be awarded repeatedly for the same results.

8.2. One student per semester cannot receive funding of more than 3000 euros on the basis of mobility or excellence scholarships. Incentives or other scholarship amounts received by a student from other sources are not included in this amount.

8.3. Up to 21000 euros are planned for 42 scholarships, but the scholarship awarding committee reserves the right to limit the number and amounts of scholarships provided each month, taking into account the available budget and other circumstances.

Further information:

The call for the scholarship is announced on the VILNIUS TECH website, both in English and Lithuanian. The links are the following: https://vilniustech.lt/studies/study-programmes/master-study-

programmes/317411?element\_id=317413&sp\_id=856714\_pr\_2024&f\_id=4&qualification=a%3A1%3A%7Bi%3A0%3Bs%3A1%3A%22M%22%3B%7Dhttps://vilniustech.lt/-stojantiesiems-/magistranturos-studijos/studiju-

programos/317403?element\_id=317404&sp\_id=856714\_pr\_2024&f\_id=4&qualification=a%3A1%3A%7Bi%3A0%3Bs%3A1%3 A%22M%22%3B%7D#Papildoma%20informacijahttps://vilniustech.lt/studies/study-programmes/master-study-

programmes/317411?element\_id=317413&sp\_id=856715\_pr\_2024&f\_id=4&qualification=a%3A1%3A%7Bi%3A0%3Bs%3A1%3A%22M%22%3B%7Dhttps://vilniustech.lt/-stojantiesiems-/magistranturos-studijos/studiju-

programos/317403?element\_id=317404&sp\_id=856715\_pr\_2024&f\_id=4&qualification=a%3A1%3A%7Bi%3A0%3Bs%3A1%3 A%22M%22%3B%7D

Regarding questions, related to the call and MERIT studies at Vilnius Gediminas Technical University, the main contact is Simona Ramanauskaitė (e-mail. simona.ramanauskaite@vilniustech.lt).

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Task description:

Demonstrate exceptional results as MERIT study program student, including, but not limiting to:

research activities and their result publication; active participation in advanced digital skill application contents and hackathon type events, promoting the benefits of advanced digital skills, MERIT project and its study program values and possibilities; advanced digital skill upskilling, gaining new experiences, competences and sharing it with others; utilizing advanced digital skills by applying it for business and public sector growth.

Expected duration of participation: One month

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### **8. HORIZON-JU-IHI-2025-09-01-single-stage (HORIZON-JU-RIA)** Boosting innovation for a better understanding of the determinants of health

| Status | Opening date  | Deadlines    | Funding type  | Keywords |
|--------|---------------|--------------|---|----------|
| Open   | 16 janv. 2025 | 29 avr. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

#### URL in Kaila:

<u>Click here</u>

#### Description:

Expected Impact:

The actions to be funded under this topic are expected to achieve the following:

a. contribute to one or more of IHI JU's expected impacts linked to Specific Objective 1 as set out in the IHI JU SRIA, i.e.:
patients benefit from preventive treatment or early disease intervention before onset of symptoms; prevention and early diagnosis of disease
combined with better understanding of the mechanisms involved, leading to the development of more cost-effective strategies; patients
benefitting from improved healthcare through regular monitoring of critical parameters using validated tools; development of new vaccine
strategies targeted to specific sub-populations; increased preparedness of EU healthcare systems for disease outbreaks.
b. contribute to strengthening the competitiveness of the EU's health industry, via increased economic activity in the development of health
technologies, in particular, integrated health solutions, thus fostering European technological leadership and the digital transformation of our societies.

The actions are expected to contribute to EU programmes, initiatives and policies such as the European Green Deal, Europe's Beating Cancer Plan, the EU Mission on Cancer, the European Virtual Human Twins Initiative, the European Health Emergency Preparedness and Response Authority (HERA), the European Commission's proposal for the European Health Data Space (EHDS), and the EU Artificial Intelligence Act1, where relevant.

1 EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act Expected Outcome:

Applicants must define the outcomes expected to be achieved by the project, ensuring that they contribute to at least one of IHI JU's potential outputs linked to the IHI JU's Specific Objective 1 'contribute towards a better understanding of the determinants of health and priority disease areas', as set out in the IHI JU Strategic Research and Innovation Agenda (SRIA).

Actions (projects) to be funded under this topic must deliver results that address public health needs and support the development of future health innovations that are safe, people-centred, effective, cost-effective and affordable for patients and for health care systems.

The expected outcomes may cover the entire spectrum of care and may be health technologies centred around disease areas and/or key themes such as prevention, precision diagnostics, personalised medicine, and chronic disease management. They may also include solutions for key enablers such as digital data and solutions, artificial intelligence (AI), regulatory science, greener and more sustainable healthcare, and implementation science1.

1 In the context of IHI, 'implementation science' refers to the development and piloting of methods and strategies that facilitate the uptake of evidence-based practice and research outcomes into regular use (e.g. translation of results, uptake, scale-up, piloting in healthcare). Scope:

With a view to harnessing new science and technologies, this topic aims to fund pre-competitive research and innovation for novel tools,

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methods, technologies etc. that will foster the development of health innovations to prevent, intercept, diagnose, treat, and manage diseases and enable recovery more efficiently.

Accordingly, applicants must assemble a collaborative public-private partnership consortium reflecting the integrative and cross-sectoral nature of IHI JU, that is capable of addressing the challenge(s) and scope of the IHI JU Specific Objective 1 'contribute towards a better understanding of the determinants of health and priority disease areas', as defined in IHI JU's legal basis1 and described in more detail in the IHI JU SRIA2:

Applicants should consider the following points in their proposals:

a. address an unmet public health need based on at least one of the below:

the high burden of the disease for patients and/or society due to its severity and/or the number of people affected by it; the high economic impact of the disease for patients and society; the transformational nature of the potential results on innovation processes where projects are not focussed on individual disease areas (e.g. health data analytics).

b. demonstrate the ability to translate research into innovative solutions that can be integrated/implemented into the health care ecosystem (taking into consideration the fragmented nature of European healthcare systems) and/or in industrial processes.

When applicable, proposals should consider relevant aspects of patient-centricity, with the help of the most suitable health technologies and/or social innovations, including open science, and taking demographic trends into account as relevant.

If applicable, applicants are expected to consider the potential regulatory impact of the anticipated project's outputs, and, as relevant, develop a regulatory strategy and interaction plan for generating appropriate evidence and for engaging with regulators and other bodies in a timely manner, e.g. EU national competent authorities, notified bodies for medical devices and in-vitro diagnostic devices, health technology assessment (HTA) agencies, and the European Medicines Agency (EMA) through existing opportunities for regulatory support services, such as the Innovation Task Force and qualification advice.

As relevant, consideration should also be given to the Health Data Access Bodies that will be established under the forthcoming European Health Data Space Regulation3 in the context of secondary use of data.

Applicants should consider relevant existing initiatives/projects to ensure synergies and complementarities and avoid unnecessary overlap and duplication of efforts. The proposal should include a plan on how to synergise with these initiatives.

1 Article 115 of the Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe

2 https://www.ihi.europa.eu/sites/default/files/flmngr/IHI\_Strategic\_Research\_and\_Innovation\_Agenda\_3.pdf

3 https://www.europarl.europa.eu/doceo/document/TA-9-2024-0331\_EN.pdf

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# **9. HORIZON-JU-IHI-2025-09-05-single-stage (HORIZON-JU-RIA)** Boosting innovation for better assessment of the added value of innovative integrated healthcare solutions

| Status | Opening date  | Deadlines    | Funding type           | Keywords |
|--------|---------------|--------------|------------------------|----------|
| Open   | 16 janv. 2025 | 29 avr. 2025 | HORIZON-JU-RIA         |          |
|        |               |              | HORIZON JU Research    |          |
|        |               |              | and Innovation Actions |          |

#### URL in Kaila:

#### <u>Click here</u>

#### **Description:**

#### Expected Impact:

The actions to be funded under this topic are expected to achieve the following:

a. contribute to one or more of IHI JU's expected impacts linked to IHI JU's Specific Objective 5, as reflected in the IHI JU SRIA, i.e.:
seamless and successful implementation in healthcare settings of cross-sectoral innovations, integrated products and services delivering proven benefits to patients, healthcare systems and society as a whole;patients have improved access to innovations that meet their needs and those of the healthcare systems;better informed decision-making at different levels of the healthcare system (authorities, organisations), that will in turn contribute to a better allocation of resources towards cost-effective innovations;faster entry to the market of cost-effective innovative solutions developed by industry, which could translate to a positive effect on their R&I investments.
b. contribute to strengthening the competitiveness of the EU's health industry, via increased economic activity in the development of health technologies, in particular, integrated health solutions, and thus fostering European technological leadership and the digital transformation of our societies.

The actions are expected to contribute to EU programmes, initiatives and policies such as the European Green Deal, Europe's Beating Cancer Plan, the EU Mission on Cancer, the European Virtual Twins Initiatives, the European Health Emergency Preparedness and Response Authority (HERA), the European Commission's proposal for the European Health Data Space (EHDS), and the EU Artificial Intelligence Act1, where relevant.

## 1 EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act Expected Outcome:

Applicants must define the outcomes expected to be achieved by the project ensuring that they contribute to at least one of IHI JU's potential outputs linked to the IHI JU's specific objective 5 'enable the development of new and improved methodologies and models for a comprehensive assessment of the added value of innovative and integrated healthcare solutions' as reflected in the IHI JU Strategic Research and Innovation Agenda (SRIA).

Actions (projects) to be funded under this topic must deliver results that address public health needs and support the development of future health innovations that are safe, people-centred, effective, cost-effective and affordable for patients and for health care systems.

The expected outcomes may cover the entire spectrum of care and may be health technologies centred around disease areas and/or key themes such as prevention, precision diagnostics, personalised medicine, and chronic disease management. They may also include solutions for key enablers such as digital data and solutions, artificial intelligence (AI), regulatory science, greener and more sustainable healthcare, and implementation science1.

1 In the context of IHI, 'implementation science' refers to the development and piloting of methods and strategies that facilitate the uptake 7 févr. 2025 | Open and forthcoming funding opportunities for artificial intelligence area

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of evidence-based practice and research outcomes into regular use (e.g. translation of results, uptake, scale-up, piloting in healthcare). Scope:

With a view to harnessing new science and technologies, this topic aims to fund pre-competitive research and innovation for novel tools, methods, technologies etc. that will foster the development of health innovations to prevent, intercept, diagnose, treat, and manage diseases and enable recovery more efficiently.

Accordingly, applicants must assemble a collaborative public-private partnership consortium reflecting the integrative and cross-sectoral nature of IHI JU that is capable of addressing challenge(s) and scope of the IHI JU's Specific Objective 5 'enable the development of new and improved methodologies and models for a comprehensive assessment of the added value of innovative and integrated healthcare solutions'; as defined in IHI JU's legal basis1 and described in more detail in the IHI JU SRIA2.

Applicants should consider the following points in their proposals:

a. address an unmet public health need based on at least one of the below:

the high burden of the disease for patients and/or society due to its severity and/or the number of people affected by it; the high economic impact of the disease for patients and society; the transformational nature of the potential results on innovation processes where projects are not focussed on individual disease areas (e.g. health data analytics).

b. demonstrate the ability to translate research into innovative solutions that can be integrated/implemented into the healthcare ecosystem (taking into consideration the fragmented nature of European healthcare systems) and/or into industrial processes.

When applicable, proposals should consider relevant aspects of patient-centricity, with the help of the most suitable health technologies and/or social innovations, including open science and taking demographic trends into account as relevant.

If applicable, applicants are expected to consider the potential regulatory impact of the anticipated project's outputs, and as relevant, develop a regulatory strategy and interaction plan for generating appropriate evidence and for engaging with regulators and other bodies in a timely manner, e.g. EU national competent authorities, notified bodies for medical devices and in vitro diagnostic devices, health technology assessment (HTA) agencies, and the European Medicines Agency (EMA) through existing opportunities for regulatory support services such as the Innovation Task Force and qualification advice.

As relevant, consideration should also be given to the Health Data Access Bodies that will be established under the forthcoming European Health Data Space Regulation3 in the context of secondary use of data.

Applicants should consider relevant existing initiatives/projects to ensure synergies and complementarities and avoid unnecessary overlap and duplication of efforts. The proposal should include a plan on how they propose to synergise with these initiatives.

1 Article 115 of the Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe

2 https://www.ihi.europa.eu/sites/default/files/flmngr/IHI\_Strategic\_Research\_and\_Innovation\_Agenda\_3.pdf

3 https://www.europarl.europa.eu/doceo/document/TA-9-2024-0331\_EN.pdf

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### **10. HORIZON-JU-IHI-2025-09-03-single-stage (HORIZON-JU-RIA)** Boosting innovation for peopled centred integrated healthcare solutions

| Status | Opening date  | Deadlines    | Funding type  | Keywords |
|--------|---------------|--------------|---|----------|
| Open   | 16 janv. 2025 | 29 avr. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

#### URL in Kaila:

<u>Click here</u>

#### Description:

Expected Impact:

The actions to be funded under this topic are expected to achieve the following:

a. contribute to one or more of IHI JU's expected impacts linked to IHI JU's Specific Objective 3, as set out in the IHI JU SRIA, i.e. raised awareness among citizens and patients on their own role in managing their health; improved patient adherence to prevention programmes and medical interventions; people, including vulnerable populations (e.g. elderly and children as well as their carers and/or representatives), are better able to make informed decisions with their healthcare professionals about prevention, treatment interventions and disease management; increased frequency and quality of cooperation between patients, citizens and industrial stakeholders in the development of healthcare solutions, in particular integrated care solutions; patients benefit from prevention and treatment better adapted to their needs through improved diagnostic and monitoring; integrated healthcare solutions, including those based on the use of digital solutions, better responding to the needs and preferences of patients and citizens, supporting an inclusive approach; successful implementation of digital solutions supporting people-centred care; facilitated introduction of innovative solutions for improved home care of patients; healthcare solutions assessed according to criteria that matter to patients and citizens (in particular, patient reported outcome measures (PROMs) and patient reported experience measures (PREMs) contributing to achieving people-centred healthcare. b. contribute to strengthening the competitiveness of the EU's health industry via increased economic activity in the development of health technologies, in particular, integrated health solutions, thus fostering European technological leadership and the digital transformation of our societies.

The actions are expected to contribute to EU programmes, initiatives and policies such as the European Green Deal, Europe's Beating Cancer Plan, the EU Mission on Cancer, the European Virtual Human Twins Initiative, the European Health Emergency Preparedness and Response Authority (HERA), the European Commission's proposal for the European Health Data Space (EHDS), and the EU Artificial Intelligence Act1, where relevant.

1 EU Artificial Intelligence Act | Up-to-date developments and analyses of the EU AI Act Expected Outcome:

Applicants must define the outcomes expected to be achieved by the project ensuring that they contribute to at least one of IHI JU's potential outputs linked to the IHI JU's Specific Objective 3 'demonstrate the feasibility of people-centred, integrated healthcare solutions', as reflected in the IHI JU Strategic Research and Innovation Agenda (SRIA).

Actions (projects) to be funded under this topic must deliver results that address public health needs and support the development of future health innovations that are safe, people-centred, effective, cost-effective and affordable for patients and for health care systems.

The expected outcomes may cover the entire spectrum of care and may be health technologies centred around disease areas and/or key themes such as prevention, precision diagnostics, personalised medicine, and chronic disease management. They may also include solutions for key enablers such as digital data and solutions, artificial intelligence (AI), regulatory science, greener and more sustainable healthcare,

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and implementation science1.

1 In the context of IHI, 'implementation science' refers to the development and piloting of methods and strategies that facilitate the uptake of evidence-based practice and research outcomes into regular use (e.g. translation of results, uptake, scale-up, piloting in healthcare). Scope:

With a view to harnessing new science and technologies, this topic aims to fund pre-competitive research and innovation for novel tools, methods, technologies etc. that will foster the development of health innovations to prevent, intercept, diagnose, treat and manage diseases, and enable recovery more efficiently.

Accordingly, applicants must assemble a collaborative public-private partnership consortium reflecting the integrative and cross-sectoral nature of IHI JU that is capable of addressing the challenge(s) and scope of the IHI JU's Specific Objective 3 'demonstrate the feasibility of people-centred, integrated healthcare solutions', as defined in IHI JU's legal basis1 and described in more detail in the IHI JU SRIA2.

Applicants should consider the following points in their proposals:

a. address an unmet public health need based on at least one of the below:

the high burden of the disease for patients and/or society due to its severity and/or the number of people affected by it; the high economic impact of the disease for patients and society; the transformational nature of the potential results on innovation processes where projects are not focussed on individual disease areas (e.g. health data analytics).

b. have people-centric, rather than product- and pathology-centric, approaches – the focus being on the patient and citizen journey through health care, with the help of most suitable health technologies and social innovations and taking account of demographic trends;

c. demonstrate the ability to translate research into innovative solutions that can be integrated/implemented into the healthcare ecosystem (taking into consideration the fragmented nature of European healthcare systems) and/or into industrial processes.

If applicable, applicants are expected to consider the potential regulatory impact of the anticipated project's outputs and, as relevant, develop a regulatory strategy and interaction plan for generating appropriate evidence and for engaging with regulators and other bodies in a timely manner, e.g. EU national competent authorities, notified bodies for medical devices and in vitro diagnostic devices, health technologies assessment (HTA) agencies, and the European Medicines Agency (EMA) through existing opportunities for regulatory support services such as the Innovation Task Force and qualification advice.

As relevant, consideration should also be given to the Health Data Access Bodies that will be established under the forthcoming European Health Data Space Regulation3 in the context of secondary use of data.

Applicants should consider relevant existing initiatives/projects to ensure synergies and complementarities and avoid unnecessary overlap and duplication of efforts. The proposal should include a plan on how they propose to synergise with these initiatives.

1 Article 115 of the Council Regulation (EU) 2021/2085 of 19 November 2021 establishing the Joint Undertakings under Horizon Europe

2 https://www.ihi.europa.eu/sites/default/files/flmngr/IHI\_Strategic\_Research\_and\_Innovation\_Agenda\_3.pdf

3 https://www.europarl.europa.eu/doceo/document/TA-9-2024-0331\_EN.pdf

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# **11. HORIZON-JU-IHI-2024-08-03-two-stage (HORIZON-JU-RIA)** Modelling regulatory sandbox mechanisms and enabling their deployment to support breakthrough innovation

| Status | Opening date | Deadlines             | Funding type           | Keywords |
|--------|--------------|-----------------------|------------------------|----------|
| Open   | 25 juin 2024 | 10 oct. 2024, 23 avr. | HORIZON-JU-RIA         |          |
|        |              | 2025                  | HORIZON JU Research    |          |
|        |              |                       | and Innovation Actions |          |

#### URL in Kaila:

#### <u>Click here</u>

#### **Description:**

#### Expected Impact:

The action under this topic is expected to achieve the following impacts:

Meaningful contributions to the successful implementation of regulatory sandboxes through developing a comprehensive and shared understanding of their use and value among key stakeholders in the healthcare ecosystem; Support the future-proofing of the EU regulatory framework by design, enabling the efficient implementation of regulatory sandboxes where and when appropriate, and thus helping to make Europe more attractive as place of innovation; Enhancing and enabling the cooperation of key healthcare stakeholders, including patients, clinicians, small and medium-sized enterprises (SMEs) and academics, with regulators in developing a competitive and innovation-friendly landscape; Fostering interaction with regulators to develop healthcare solutions when it is not possible to develop them within the current framework.

The action will also contribute to a number of European policies/initiatives, which include:

the European Commission's Pharmaceutical Strategy for Europe, specifically the pillar on competitiveness, innovation and sustainability;related measures under the ongoing revision of the Pharmaceutical legislation;the European Commission innovation agenda (published in 2022) flagship initiative "Enabling innovation through experimentation spaces and public procurement" facilitating innovation through improved framework conditions including experimental approaches to regulation (e.g. regulatory sandboxes);the EU biotech strategy;the green and sustainability agenda. Expected Outcome:

The action under this topic must contribute to all of the following outcomes:

A horizon scanning for potential sandbox candidates including how sandboxes provide an additional tool to existing frameworks and identified examples to model the process; Analysis of how regulatory sandboxes can drive science and health technology innovation in an evolving environment; Recommendations for end-to-end operations of regulatory sandboxes to inform healthcare innovation developers, regulators, and other decision makers. Scope:

While there is no concrete definition, regulatory sandboxes generally refer to regulatory frameworks that provide a structure for healthcare innovation developers to test and experiment with new and innovative products, services, or approaches under the oversight of a regulator for a limited period of time. These adaptive tools are meant to address challenges arising from the acceleration of technological/scientific advances and the mechanisms intended to regulate them. It offers customisation in terms of how a regulatory framework can be applied, combined with appropriate safeguards.

Regulatory sandboxes, first tested in the fintech sector (2015), are starting to transform the traditional methods used by regulatory agencies in the health sector to accompany the development of safe, efficacious, and high-quality health technologies1, which, due to their level of novelty, challenge the current regulatory framework. The mechanism enables breakthrough developments and the testing of alternative regulatory approaches for disruptive innovations for medicinal products, related platforms and their combinations, including where appropriate medical and digital technologies. Regulatory sandboxes are mentioned as important future-proofing elements in the legislative proposal2 of the European Commission on the general pharmaceutical legislation. The European Commission's communication to bo ost biotechnology and biomanufacturing in the EU further promotes the establishment of regulatory sandboxes that allow the testing of novel solutions in a controlled environment for a limited amount of time under the supervision of regulators as a way of quickly bringing more of 7 févr. 2025 | Open and forthcoming funding opportunities for artificial intelligence area

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them to the market3. Regulatory sandboxes are not featured in the medical devices and in vitro diagnostics regulations (MDR and IVDR)4, but the artificial intelligence (AI) Act5 creates an opportunity for regulatory sandboxes focused on case studies for AI-enabled medical devices. Regulatory sandboxes entail a shared learning objective for innovators (finding a pathway and getting regulatory predictability) and regulators (understanding the technology and defining how best to regulate it). The mechanism helps to inform future regulation through experimentation and evidence generation and minimises the risks of regulating ex-ante innovative and novel approaches prematurely or inappropriately. For the same reasons regulatory sandboxes also potentially facilitate the more efficient or rapid subsequent adaptation of the legislation either through translation into an adapted regulatory framework and/or through recommendations when the time comes for revising existing or developing new legislation.

Regulatory sandboxes should be able to experiment and draw on several relevant healthcare innovation related frameworks other than pharmaceutical products (i.e. medical devices, in-vitro diagnostics, AI, digital health technologies, and substances of human origin among others). Due to their anticipatory and adaptive nature, regulatory sandboxes are well placed to address gaps and complexity within and across regulatory frameworks. Indeed, as the number of drug and device combinations increases, and technology integration becomes the norm rather than an exception in healthcare innovation R&D, manufacturing and healthcare delivery, the current siloed technology-specific frameworks may not provide a clear path forward. To that end, when considering an innovation, it is important to consider all relevant legislative frameworks including MDR and IVDR, the Clinical Trials Regulation6, the General Product Safety Regulation7 and AI ACT among others.

Although still new to the healthcare and pharmaceutical sector, there are a few examples of regulatory sandboxes such as the Sante Canada sandbox for advanced therapeutic products or the Singapore sandbox to test telemedicine. More recently, the UK launched the MHRA Alairlock to assist in the development and deployment of software and AI medical devices, safely providing patients with earlier access to cutting edge innovations that improve care.

The overall aim of this IHI topic is to contribute to the progression and successful implementation of regulatory sandboxes for healthcare innovations by developing a comprehensive and shared understanding of their value and process of implementation. The topic should also enable the development of a cross-sectoral community of stakeholders including pharma and medical device companies, regulators, and health technology assessment bodies (HTAs), among other stakeholders.

To fulfil this aim, the proposal should:

1. Scan the horizon for potential sandbox candidates including how sandboxes provide an additional tool to existing frameworks, and use the examples identified to model the process.

To this end, a key objective is to identify a number of healthcare innovation case studies to better understand how a regulatory sandbox could be used to solve further-defined challenges at an existing regulation level and inform recommendations for end-to-end operations. These cases could draw from the past, present and from horizon scanning activities (the EMA's work in this area already provides a hint8) to anticipate future innovations, looking across their development value chain.

2. Analyse how regulatory sandboxes can drive science and health technology innovation in an evolving environment.

#### The proposal should do this by:

anticipating consequences for health technology development under a regulatory sandbox mechanism, acknowledging its time-limited scope and the consequences (considering the technical particularities of healthcare innovation) for other downstream activities e.g., standardisation, health technology assessment;proactively identifying any guardrails and mitigation measures. 3. Develop recommendations for end-to-end operations of regulatory sandboxes to inform healthcare innovation developers, regulators and downstream decision makers.

#### The proposal should do this by:

mapping out conceptual elements and operationalisation features of future sandbox mechanisms based on existing experiences in other fields such as governance, conditions fostering dialogue and collaboration, access to the right type of expertise, support, regulatory customisation, sharing/communicating lessons learned and their translation via the appropriate frameworks into new standards, among

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other elements to be further defined; modelling how to operationalise the sandbox(es) (including governance, operations, principles) and how they could be used in healthcare innovation development and evaluation in conjunction with existing regulatory mechanisms to advance innovation at European and national levels.

Part of the topic entails modelling a regulatory sandbox. The proposal should therefore consider good practices for designing and evaluating the necessary operating models to ensure the robustness and future applicability of the output of the project.

The project outcomes could also offer directions for the translation of the resulting recommendations into digital tools and systems deemed necessary for the functioning of regulatory sandboxes (e.g. ensuring collaboration between different health authorities' triage mechanisms, horizon scanning, fitness check evaluations), as relevant.

When developing a comprehensive and shared understanding of the value of regulatory sandboxes, applicants will have to explore key aspects across the life-cycle of healthcare innovations with the objective of accompanying their ultimate adoption, which could include as appropriate R&D, regulatory authorities, HTA bodies, payers, governments, clinicians and patients. Ethical considerations would also have to be considered as some innovations could trigger questions in this field. A shared objective should include to develop a regulatory strategy and interaction plan for generating appropriate evidence, enabling engagement across all the different decision makers in a timely manner (e.g. national competent authorities, EMA and the respective Innovation Task Force, qualification advice) and identifying aspects that can be leveraged by existing regulatory tools, as well as the limiting aspects and the flexibilities that would be required under a regulatory sandbox to achieve the timely development and access of healthcare innovations.

1 'health technology' means a medicinal product, a medical device or medical and surgical procedures as well as measures for disease prevention, diagnosis or treatment used in healthcare.

2 Proposal for a Regulation of the European Parliament and of the Council laying down Union procedures for the authorisation and supervision of medicinal products for human use and establishing rules governing the European Medicines Agency, amending Regulation (EC) No 1394/2007 and Regulation (EU) No 536/2014 and repealing Regulation (EC) No 726/2004, Regulation (EC) No 141/2000 and Regulation (EC) No 1901/2006 Chapter IX Regulatory Sandbox (Articles 113-115)

3 https://research-and-innovation.ec.europa.eu/document/download/47554adc-dffc-411b-8cd6-b52417514cb3\_en

4 Regulation (EU) 2017/745 of the European Parliament and of the Council of 5 April 2017 on medical devices and Regulation (EU) 2017/746 of the European Parliament and of the Council of 5 April 2017 on in vitro diagnostic medical devices.

5 Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act).

6 Regulation (EU) No 536/2014 of the European Parliament and of the Council of 16 April 2014 on clinical trials on medicinal products for human use.

7 Regulation (EU) 2023/988 of the European Parliament and of the Council of 10 May 2023 on general product safety.

8 Health horizons: Future trends and technologies from the European Medicines Agency's horizon scanning collaborations: https://doi.org/10.3389/fmed.2022.1064003.

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# **12. HORIZON-JU-IHI-2024-08-02-two-stage (HORIZON-JU-RIA)** Novel Endpoints for Osteoarthritis (OA) by applying Big Data Analytics

| Status | Opening date | Deadlines                     | Funding type  | Keywords |
|--------|--------------|-------------------------------|---|----------|
| Open   | 25 juin 2024 | 10 oct. 2024, 23 avr.<br>2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

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#### Description:

Expected Impact:

The project should contribute to all of the following impacts:

the federated integration of big data from disparate data sources including the use of digital twin and similar methodological approaches will lay the foundation for advanced clinical trial designs that allow for more efficient and smaller trials, as well as the reduction of patients' burden and exposure to placebo; the development of predictive models for disease progression and joint replacement, which are crucial to efficiently discuss treatment strategies, support assessments of quality in health care and equitably plan and allocate health care resources. In addition, such predictive models can revolutionise outcome trial designs, shortening the trial duration and patient burden as well as reducing development costs. The aspired modular flexibility to data availability allows for their sustained use in various settings and economic circumstances; the stratification of different patient groups and targeting of treatments to patients' needs and preferences, which enables the development of successful therapies, informs development strategies, improves patient and caregiver engagement and optimises trial designs. This stratification also supports data-based shared decision making for health care solutions in clinical practice; availability of tools that enable specific functional measurements and reflect the real-life treatment benefit for patients. These tools have been positively evaluated for practicality and scientific validity and could be used for systematic assessments complementing clinical and patient reported information. All of the above will allow for better trial designs that can demonstrate the treatment benefits of medicines and health care solutions in early development programmes with limited numbers of patients. Expected Outcome: The action under this topic must contribute to all the outcomes listed below, by integrating existing data sets (clinical registries, prospective observational trials and real-world evidence data, for example from medical claims and biobanks as well as genotypic and epigenetic information), and data collections from historical and ongoing clinical trials (provided by industry partners). Algorithms and models, including Artificial Intelligence (AI)-based models, that are adaptable to differences in data availability have been developed and validated in different datasets to allow for the identification of osteoarthritis (OA) patient subpopulations (phenotypes/endotypes) that will benefit from specific, targeted treatment approaches. The identification of subpopulations will be based on: the patient-specific burden of osteoarthritis with focus on underlying drivers (e.g. metabolic disease) and multi-morbidity/holistic patient profiles; the evaluation of underlying pathways driving local vs. centralised pain in joint disease and the correlation of symptoms to joint tissue pathology; the identification of key risk factors for pain in joint disease that can be linked to structural disease progression providing insights into the symptom-structure discordance in OA; the detection of joint areas at risk of progression and quantification of structural progression to a more advanced stage; the measures from existing innovative tools such as functional assessments with mobility and activity assessing devices (including algorithms) to reflect independence, gait measures, and assessments of muscular strength and function, as well as balance and coordination to subtly measure functional changes; evaluating the differences and commonalities of osteoarthritis (OA) and inflammation-driven joint diseases such as psoriatic arthritis (PsA), rheumatoid arthritis (RA), erosive hand osteoarthritis (eHOA). A validation strategy is provided for a selected set of novel endpoints to measure and predict OA disease progression that enables planning of regulatory implementation pathways. This validation strategy supports innovative outcome-based and patientcentred development approaches for medicines and other therapeutic options to be discussed by regulatory authorities, health technology assessment (HTA) bodies, healthcare providers, patients, scientists and industry, shaping new approaches to the development of efficient treatments in OA and respective regulatory frameworks; A decision tool is developed - based on the predictive models - that supports shared decision-making for patients, their caregivers and healthcare providers according to the predicted disease progression, the most likely

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associated OA disease drivers and the current disease burden; A robust, trustworthy, and interpretable AI framework is established, that enables the development of guidelines or determines any boundaries for predictive modelling at various stages of value generation e.g. biological discovery, patient subgrouping, and clinical trials enrichment. Measures to mitigate the risk of bias and discrimination are implemented including, but not limited, to: careful consideration of data sets to ensure diversity and inclusion (or account for the lack thereof); the running of bias-unaware AI models and provision of fairness metrics; applying AI models within frameworks mitigating bias and promoting fairness during the pre-processing, in-processing and post-processing phases. Data platform(s) are designed and implemented to allow a workable and efficient collaboration across the participating organisations in their respective geographies, respecting each data contributor's access, privacy and consent approaches, which can be facilitated by federated data sharing. This outcome may serve as a blueprint for other data collaborations under the umbrella of the EU's newly implemented AI act and data policies 1, 2. It is expected that certain existing assets like clinical data, algorithms, and data storage infrastructure will be used as background in this action. Therefore, beneficiaries intending to participate in this data-driven action need to be comfortable with the principle that ownership of specific deliverables / project results which would be considered direct improvements to a beneficiary's background asset, will need to be transferred back to the beneficiary who contributed the background asset to the project. Provision for, and conditions relating to such transfers should be specified in the project's consortium agreement.

1 Proposal for a Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts (2021/0106(COD), 26 Jan. 2024, pdf (europa.eu), last accessed 04.04.2024

2 Proposal for a regulation - The European Health Data Space Proposal for a regulation - The European Health Data Space - European Commission (europa.eu), last accessed 04.04.2024

#### Scope:

Osteoarthritis (OA) has no cure and affects the lives of more than 500 million people worldwide with widespread individual, societal and economic consequences. Economic consequences pertain on one hand to health care utilisation and health care spending, OA is however also associated with relevant economic impact on the individual due to missed days at work, early retirement, and substantial out-of-pocket expenditures. Since OA primarily affects the elderly, females, patients with lower levels of education and socio-economic status and certain ethnicities, the associated economic risk hits already vulnerable populations. OA has long been underestimated in its impact; the disease negatively affects social functioning and ranks 7th for years lived with disability in people over 70 years. With its impact on activities of daily living, OA is a major risk factor for loss of independence. Additionally, OA is associated with increased mortality.

Despite major research efforts and increasing insights into the mechanism, epidemiology, risk factors and natural history of OA, various development efforts over the years have failed to provide a disease-modifying treatment. The epidemiology as well as clinical and biological insights strongly suggest the existence of several pheno- and endotypes of osteoarthritis; failure to account for those differences critically hampers progress in the field. The implementation of innovative approaches to stratify the patient population, predict the course of disease and define patient-relevant endpoints is specifically relevant in an ageing society with a high prevalence of obesity, metabolic syndrome, and multi-morbidity. Furthermore, there is an increasing prevalence of post-traumatic secondary OA in relatively young individuals affected at the prime of their lives. First studies towards the clustering of patient groups and development of predictive models have be en published suggesting the feasibility of these approaches. Bringing all those insights together requires the collaboration of experts from various fields and can only be achieved in the concerted action of a public-private partnership, including existing initiatives.

The overall aim of this topic is to build a public-private partnership that is able to integrate and leverage the plethora of existing and currently collected data on OA, as well as the increasing insights and expertise gathered over decades of research. Further, the goal is to use a data driven approach to significantly progress the field by leveraging the novel opportunities that have emerged thanks to increased computing power and innovative methodologies in big data analysis, in order to:

integrate different perspectives to improve the understanding of osteoarthritis as a complex disease; foster progress towards regulatory validation of patient-relevant endpoints to measure and predict OA disease progression as well as alternative endpoints to measure response to treatment; allow predictive modelling while actively seeking feedback to incorporate the perception of patients, care givers, primary care physicians and regulators.

The action generated by this topic should pave the way towards transforming the current isolated research efforts and static late-stage development approaches into a more patient-centred and simplified (more inclusive/enriched patient population, shorter study duration, potential enablement of the evaluation of preventive or early therapeutic strategies based on predicted outcomes, cost-effectiveness etc.) as well as sustainable part of clinical research and development. This aim is supported by increasing the insights into OA as an heterogenous

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disease with various underlying patient risk profiles, patho-mechanistic pathways and underlying genotypic/epigenetic/ metabolomic/transcriptomic phenomena based on big data. Such insights will allow for the creation of integrated risk profiles combining clinical and multi-omic approaches (e.g. clinical characteristics, transcriptomics, proteomics, genetic markers, and in-depth multimodal imaging data).

These advances are needed to support the development of patient-relevant and cost-efficient integrated health care solutions including focused, individualised treatments for specific patient segments. The use of AI-based approaches is crucial for the integration of the totality of existing patient datasets and mechanistic disease insights to better understand disease drivers in various tissues of joints thereby upscaling, broadening and/or sharpening current methodology.

#### The proposed action must:

gather and provide access to high quality data - including clinical data from trials (mainly data from placebo arms from studies run outside the project) provided by the pre-identified industry consortium and by applicants as well as prospective observational data, registry data and cohort data including genetic, imaging, soluble biomarker, and data from wearables among others; provide a flexible federated data lake house with appropriate tools for access, management and governance, data curation, integration, and augmentation for consequent highperformance analytics using for example new or contributed AI (foundation) models and modelling workflows. This infrastructure will deploy existing or newly developed approaches or implementations to host and analyse disparate data assets ranging from public, commercial, and not-for-profit observational and trial clinical data to -omics, images, or data from wearables. In their proposal applicants should address key challenges around federated data collection, data privacy, data transfer, data storage, data processing, curation, and harmonisation of data, etc. to achieve a comprehensive understanding of OA by upscaled, big data analytics from: genetic analyses (GWAS);AI-driven big data analyses for identification of clinical patterns in phenotypes and endotypes; algorithm-based imaging analyses of whole joints and periarticular tissues; the evaluation of performance assessments using novel technologies and devices. generate and provide a validation strategy for a risk model of disease progression by evaluating whether and to which extent risk factors and predictive models identified in the literature and the above-mentioned data sets are reliably predictive for the progression of structural joint changes as evidenced by imaging, pain and functional decline documented by patients and ultimately leading to joint replacement surgery. The combination of surrogate markers such as imaging [1] with medical history and medication, as well as with predictive markers (plasma-based multi-omics, polygenic risk scores) [2][3], patient reported outcome data and data from wearables or performance tests [4], will generate a more refined predictive engine in analogy to, for example, established fracture risk prediction algorithms in osteoporosis; work towards a broad consensus between all stakeholders especially linking patients, caregivers and healthcare providers' perspectives to regulatory and health technology assessment (HTA) bodies. This will enable the elaboration of a set of endpoints relevant to these groups depending on the phase of development of treatments (i.e. early phase trials for medication or device efficacy, while late-stage development needs to prove effectiveness, which may necessitate different sets of outcomes), incorporating the various domains of assessments, and taking into account the predominant effect (structural or symptomatic) of the evaluated treatment. This will help to shape new regulatory frameworks for accelerated targeted OA treatment development based on big data analyses, in-silico trials, digital twin approaches and similar innovative trial designs; use data analysis and modelling to provide evidence and knowledge that could enable the evaluation of existing innovative tools (such as functional assessments, imaging approaches etc.) and innovative treatment solutions for OA, based on their scientific validity and feasibility as a prerequisite. Design a strategy to progress them towards regulatory validation and implementation. The action should provide an exploratory and interactive platform to evaluate the validity and user-preference of novel methods of evidence generation, such as the use of data from wearable devices, innovative imaging, and surrogate markers for joint replacement surgery; model short - and long-term economic and public health impact from OA including morbidity and mortality. These new risk models should support benefit/risk assessment as well as quality and efficacy assessments of therapeutic interventions in patients diagnosed with OA to prevent or delay the onset of disease progression, but also avoid overtreatment and thereby optimise the use of health care resources; develop a decision tool based on predictive models that can support shared decision-making between physicians, patients and their caregivers to select the intervention best suited to address the various stages and symptoms of OA in an individual patient, integrating also patient reported outcome and experience measure (PROMs and PREMs) data as well as patient preferences. The diversity of patients at risk or affected by the disease must be considered when discussing patient-relevant outcomes to enable the focused development of treatments and healthcare solutions specific to the needs of individual patients; leverage real-world evidence (RWE) data to address the diversity of patients including sex and gender, ethnicity, and race disparities to develop patient engagement strategies. This should enable engagement with specific groups for the design of OA outcome trials and better promotion of OA management.

The action should contribute to addressing the research needs outlined in the Regulatory Science Research Needs initiative1, launched by the European Medicines Agency (EMA), assessing the utility of real-world healthcare data to improve the quality of randomised controlled

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trial simulations and patient and public involvement and engagement.

Therefore, applicants are expected to consider the potential regulatory impact of the results and – as relevant – develop a regulatory strategy and interaction plan for generating appropriate evidence as well as engaging with regulators in a timely manner (e.g. national competent authorities, EMA Innovation Task Force, qualification advice).

Consideration should be specifically given to patient and public involvement and engagement in the implementation of all of the above activities. The applicants are expected to leverage prior learnings, for example, previous experiences that have demonstrated the importance of transparent and accessible structures to receive input from patients, caregivers and health care providers as key stakeholders and integrate expertise from various fields relevant in this context [5]. The continuous and active engagement of all groups is indispensable to meet patients' and providers' needs and leverage synergies between practitioners and scientists, especially to ensure the sustainability of potential outputs.

Applicants should provide in their proposal evidence that they have in place all permissions (legal, ethical) needed for accessing the data necessary to implement the action.

Note that the implementation of prospective clinical studies is not supported by this topic.

1 https://www.ema.europa.eu/en/documents/other/regulatory-science-research-needs\_en.pdf, last accessed March 19th 2024

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## 13. CREA-CROSS-2025-INNOVLAB (CREA-PJG)

### Creative Innovation Lab

| Status | Opening date | Deadlines    | Funding type        | Keywords |
|--------|--------------|--------------|---------------------|----------|
| Open   | 24 oct. 2024 | 24 avr. 2025 | CREA-PJG            |          |
|        |              |              | CREA Project Grants |          |

#### URL in Kaila:

#### <u>Click here</u>

#### **Description:**

#### Objective:

WARNING: BEFORE SUBMITTING, APPLICANTS ARE STRONGLY ADVISED TO CHECK THE RELEVANCE AND ELIGIBILITY OF THEIR APPLICATION WITH THEIR DOMESTIC CREATIVE EUROPE DESK (https://culture.ec.europa.eu/resources/creative-europe-desks)

The InnovLab support shall support the design, development and/or spread of innovative tools, models or solutions applicable in the audiovisual and other cultural and creative sectors (CCSs) with a high potential of replicability in those sectors.

The objectives of the scheme is to encourage cooperation between the audiovisual sector and other CCSs in order to accompany their environmental transition and/or to improve their competitiveness and/or the circulation, visibility, discoverability, availability, diversity and the audience of European content across borders. The support also aims to enable the European audiovisual sector and other CCSs to better adapt to the opportunities offered by the development of Artificial Intelligence and Virtual Worlds.

#### Expected results

Improve the competitiveness of the European audiovisual and other cultural and creative sectors: transparency, data collection and the appropriate use of artificial intelligence/big data, adaptation to the challenges and opportunities driven by the ongoing changes in those sectors; Improve the adaptation of the European audiovisual and other cultural and creative sectors to the opportunities offered by the development of virtual worlds (also called metaverse(s)). Improve the production/financing and circulation of European audiovisual and cultural content in the digital age; Increase the visibility, discoverability, availability and diversity of European audiovis ual and cultural content in the digital age; Increase the potential audience of European audiovisual and cultural content in the digital age. Accelerate the environmental transition of the European audiovisual, cultural and other creative sectors, in line with the priorities of the European Green Deal and the New European Bauhaus.

Description of the activities to be funded

#### Projects must focus on one (or several) of the below topics:

Virtual Worlds as a new environment for the promotion of European content, audience renewal and competitiveness of European content industries;Innovative Business Tools for production, financing, distribution or promotion enabled or enhanced by new technology (AI, big data, blockchain, Virtual Worlds, NFT, etc.), in particular: Rights' management and monetisation (including innovative bundled subscription offers to access diverse European cultural content from various existing European platforms), at the same time ensuring transparency and fair remuneration for creators and artists;Data collection and analysis, with particular emphasis on prediction for content creation and audience development (including innovative cross-sectoral tools to improve the quality of the subscriber service and a better valorisation of European content offered by European online platforms); "Greener" practices in order to lower the impact on the environment of the audiovisual and other cultural sectors in line with the Commission's Green Deal and the New Bauhaus initiative.

Cross-sectoral cooperation between the audiovisual and other cultural and creative sectors is at the heart of the Call. Therefore, applications must clearly demonstrate the extent of the cross-sectoral approach, the conditions for its implementation and the expected benefits for the sectors covered.

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A wide spectrum of organisations will be invited to participate, including private and public entities, tech companies and start-ups, audiovisual, cultural and creative organisations. The participation of business incubators and accelerators shall be encouraged, to provide space and time for creative ideas to be shaped.

Content development and/or production costs can only be supported if they are clearly linked to the development of innovative tools or models proposed by the project. They must be proportionate and limited.

Financial support to third parties is allowed for grants.

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# **14. HORIZON-JU-IHI-2024-08-04-two-stage (HORIZON-JU-RIA)** Patient-Centred Clinical-Study Endpoints Derived Using Digital Health Technologies

| Status | Opening date | Deadlines                     | Funding type  | Keywords |
|--------|--------------|-------------------------------|---|----------|
| Open   | 25 juin 2024 | 10 oct. 2024, 23 avr.<br>2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

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#### Description:

Expected Impact:

The action under this topic is expected to achieve the following impacts:

greater benefit to patients from improved health care by ensuring that DHT-derived measures of how a patient feels and functions are accepted as patient-centred clinical-study endpoints; patients having improved access to innovations that meet their needs through the development of new and improved evidence-based methodologies for a more comprehensive assessment of the added value of innovative therapeutic drugs and technologies; better informed decision-making at all levels of the health care system (authorities, organisations) to facilitate cost-effective allocation of health resources, continuing innovation, and better health outcomes; greater understanding of the relationship between multiple patient-centred measurements including PPI, COAs, and DHT-derived measures and how these measures, when considered together, can provide greater insight into the patient perspective; reduced uncertainty regarding the PPI and COA data required to demonstrate the patient-relevance of DHT-derived clinical-study endpoints, and that needed to determine what constitutes a MCID in a patient-centred DHT-derived and more efficient engagement between industry and stakeholders in the evaluation of technologies developed using patient-centred DHT-derived endpoints in clinical studies; increased speed and efficiency in the development and evaluation of innovative therapeutic technologies. Expected Outcome:

The action under this topic must contribute to all of the following outcomes:

organisations and institutions involved in the development of therapies for the treatment and management of chronic disease have access to a unifying framework and consensus-based recommendations for: using a combination of patient preference information (PPI), clinical outcome assessments (COAs), and digital health technology (DHT)-derived measures to demonstrate the importance to patients of what is being measured by DHT-derived clinical-study endpoints;determining, from the patient perspective, what constitutes a minimal clinically important difference (MCID) in a patient-centred, DHT-derived clinical-study endpoint. new methods for analysing PPI and COA data collected using DHT and for combining data from PPI, COA, and DHT-derived measures are available to researchers;a consistent framework for engagement regarding the development and use of patient-centred, DHT-derived clinical-study endpoints is available to industry and stakeholders;acceptance of the use of PPI, COAs, and patient-centred DHT-derived measures in addition to or in combination with traditional clinical-study endpoints to provide a robust view of the benefits of a therapy to patient;acceptance of the use of patient-centred DHTderived measures for clinical-study endpoints as reliable evidence for the evaluation of the clinical and economic benefit of therapeutic medicinal products and medical technologies among stakeholders including, but not limited to, patient groups, regulatory bodies, and health technology assessment (HTA) bodies (including the EU Member State Coordination Group on HTA), indicated by a qualification opinion, endorsement, adoption or other approval by each relevant stakeholder group;patient-centred, DHT-derived endpoints are implemented along with traditional clinical-study endpoints in clinical studies of therapies to treat chronic diseases, and data from DHT-derived clinicalstudy endpoints are used in regulatory and reimbursement decision-making. Scope:

Three types of patient-centred information related to how a patient feels and functions contribute to the evaluation of outcomes of a therapy:

patient preference information (PPI); clinical outcome assessments (COAs) (including patient-reported outcome (PRO) measures); digital health technology-derived (DHT-derived) measures.

Each of these types of measures can be used to understand patient-centred benefits of therapies (i.e., meaningful improvements in how a

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patient feels or functions).

DHT-derived measures can capture patient-centred information about disease symptoms, physical, cognitive, and emotional functions, and experience with therapy. They can measure the status of a patient's health in ways that may be related to, but often differ from, COAs. For example, DHTs may measure activity intensity but not specific activities. Likewise, DHT-derived measures may detect changes in patient-centred outcomes - such as function - earlier than a patient may notice such a change. For patient-centred DHT-derived measures (i.e., DHT-derived measures that capture how a patient feels and functions) to be useful as endpoints in clinical studies, they must not only be technically validated, but also demonstrate that they measure functions, activities, symptoms, and other impacts of disease and treatment that are important to patients and measure changes in these outcomes that are meaningful to patients.

PPI, COAs, and DHT-derived measures are different, but complementary, types of patient-centred data. Because these measures are complementary, using these measures in combination will provide a more robust view of the benefits of therapies measured using DHT-derived endpoints from the patient perspective. Combining these complementary measures is necessary to demonstrate the utility of using DHT-derived measures as clinical study endpoints that reflect the value of treatment benefits to patients. Specifically, using these measures in combination may contribute to determining what constitutes a minimal clinically important difference (MCID) in patient-centred DHT-derived endpoints from the patient perspective in clinical studies of therapies to treat chronic diseases. For the purpose of this project, a chronic disease is defined as a long-term health condition that may not have a cure.

However, despite recent increases in the use of PPI, COAs, and patient-centred DHT-derived measures, there is no unifying framework for understanding the relationships among these measures, nor how they can be used in combination to demonstrate meaningful, patient-centred benefits of therapies for chronic diseases in clinical studies.

Therefore, uncertainties exist regarding the utility of these measures either alone or in tandem, and the meaning fulness to patients of patient-centred DHT-derived measures when used as clinical study endpoints in the development of therapeutic products (including, but not limited to, pharmaceutical products, combination products, and therapeutic devices) for the treatment of chronic diseases.

The topic aims to develop a unified framework and consensus-based recommendations for using multiple types of patient-centred information to support the use of DHT-derived endpoints to demonstrate therapeutic benefit. This will ensure that therapies addressing patients' needs are approved for use and reimbursed at levels that reflect the value of the therapies to patients.

To fulfil this aim, the action funded under this topic must:

1. Develop a framework for using PPI, COAs, and DHT-derived measures in combination for the development, acceptance and implementation of patient-centred DHT-derived clinical-study endpoints in clinical studies of potential treatments for chronic diseases.

The framework will be designed to ensure that PPI, COAs, and patient-centred DHT-derived measures used in combination will be accepted as reliable evidence to support the use of DHT-derived clinical study endpoints in the evaluation of the clinical and economic benefit of therapeutic drugs and technologies.

#### The framework must:

include recommendations for using the three types of patient-centred data in addition to or in combination with traditional clinical-study endpoints to provide evidence of the patient-centred benefits of therapeutic drugs and technologies;describe the potential relationships among COAs, patient-centred DHT-derived endpoints and other common types of clinical study endpoints;identify and address issues related to how and under which circumstances data from PPI and COAs can be used to determine what constitutes a MCID in a patient-centred DHTderived clinical-study endpoint from the patient perspective;identify and address issues related to whether and how data from PPI, COAs, and patient-centred DHT-derived measures can be pooled, including the need for new techniques (including, but not limited to, artificial intelligence, machine learning, and large language models) to jointly analyse pooled data from the different types of measures;address issues related to diversity in patient populations (e.g., disease type, disease stage, health literacy, cultural factors, etc.) on the use and results of PPI, COAs, and DHT-derived measures and the ethical and equity implications of patient diversity on the interpretation and utility of patientcentred measures of therapeutic benefit.

2. Develop recommendations for:

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using quantitative PPI to better understand COA data by demonstrating the relative importance of domains, items, and scores (and changes therein) within a COA instrument and relative to other commonly used endpoints (including endpoints included in relevant core outcomes sets) in clinical studies within the same therapeutic area; understanding the relationships between COA data and patient-centred DHT-derived endpoints in diverse therapeutic area; using DHTs (e.g., apps, smart personal devices, smart drug-delivery devices, therapeutic medical technologies, etc.) to collect PPI and COA data; using quantitative PPI, COAs, and patient-centred DHT-derived measures in combination to demonstrate the importance to patients of what is being measured by DHTs and determining what constitutes a MCID in a patient-centred, DHT-derived clinical-study endpoint.

3. Conduct at least four use cases to provide evidence to support the framework and recommendations.

Each use case should address one or more recommendations and all recommendations should be supported by one or more case studies. Applicants should specify the methodology to be applied in each use case and identify how each use case will inform the framework and recommendations. The set of use cases should:

include a range of digital measurement domains (e.g., physical activity, sleep, cognition, fatigue, or others) and address differences between passive and interactive DHTs;include a range of patient ages (e.g., paediatric, adolescent, younger adults, and older adults);address issues related to diversity in patient populations (e.g., disease type, disease stage, health literacy, cultural factors, underserved patient populations);address issues related to combining and/or jointly analysing PPI, COA, and/or DHT-derived data using new techniques (including, but not limited to, artificial intelligence, machine learning, and large language models);be conducted in partnership with academic medical centres and focus on all of the following areas: paediatric radiation oncology;lung cancer;non-motor and motor symptoms in Parkinson's disease;obesity.

All use cases must be conducted in a way that is consistent with generally accepted international treatment guidelines in the relevant disease area.

The precise scope of the use cases will be developed by the full consortium during the preparation of the full proposal at the second stage. Case studies should not involve the de novo development of novel COAs, DHTs, or DHT-derived measures.

4. Include robust input from relevant stakeholders. Applicants are expected to specify how relevant stakeholders will be engaged and identify the type of stakeholder required and their expected role in the project. Accordingly, applicants are expected to: engage patients, parents or carers of juvenile patients, and patient organisations as active partners in all aspects of the project to ensure that interaction between patients and research is active, meaningful, and collaborative across all stages of the research process. In this way, research decision making is guided by patients' contributions as partners, recognising their specific experiences, values, and expertise; develop the framework and recommendations in consultation with stakeholders, including patient organisations, regulators, health technology assessment (HTA) bodies, and medical organisations to ensure consensus about what is required to demonstrate the patient-centred benefits of a therapy; develop a regulatory strategy and interaction plan for evidence generation to support the regulatory qualification of the framework and recommendations and engage with regulators in a timely manner (e.g., national competent authorities, EMA Innovation Task Force, qualification advice).

5. Complement and coordinate with other initiatives including:

ongoing and completed European projects (and their successor organisations), and initiatives related to patient engagement and use of digital measurement technologies. Such projects may include, but are not limited to, IMI/IHI projects PRO-active, H2O, PREFER and the PREFER Expert Network, SISAQOL-IMI, IDEA-FAST, MOBILISE-D, IMPROVE, PaLaDin as well as EUnetHTA 21; existing frameworks and guidance documents related to patient-focused drug development such as those from FDA and EMA; existing frameworks and guidance documents related to the development and deployment of digital clinical measures such as those from the Digital Medicine Society.

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# **15. DIGITAL-ECCC-2024-DEPLOY-CYBER-07-SOC (DIGITAL-JU-SIMPLE)** National SOCs

| Status | Opening date | Deadlines    | Funding type                                     | Keywords |
|--------|--------------|--------------|--|----------|
| Open   | 4 juil. 2024 | 27 mars 2025 | DIGITAL-JU-SIMPLE<br>DIGITAL JU Simple<br>Grants |          |

#### URL in Kaila:

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#### Description:

Expected Outcome:World-class National SOCs across the Union, strengthened with state-of-the-art technology, acting as clearinghouses for detecting, gathering and storing data on cybersecurity threats, analysing this data, and sharing and reporting CTI, reviews and analyses.Threat intelligence and situational awareness capabilities and capacity building supporting strengthened collaboration between cybersecurity actors, including private and public actors. Objective:

The objective is to create or strengthen National SOCs, in particular with state-of-the-art tools for monitoring, understanding and proactively managing cyber events, in close collaboration with relevant entities such as CSIRTs. They will also, where possible, benefit from information and feeds from other SOCs in their countries and use the aggregated data and analysis to deliver early warnings to targeted critical infrastructures on a need-to-know basis.

#### Scope:

The aim is capacity building for new or existing National SOCs, e.g., equipment, tools, data feeds, as well as costs related to data analysis, interconnection with Cross-Border SOC platforms, etc. This can include for example automation, analysis and correlation tools and data feeds covering Cyber Threat Intelligence (CTI) at various levels ranging from field data to Security Information and Event Management (SIEM) data to higher level CTI. National SOCs should also leverage state of the art technology such as artificial intelligence and dynamic learning of the threat landscape and context. This also includes the use of shared cybersecurity information, to the extent possible based on existing taxonomies and/or ontologies, and hardware to ensure the secure exchange and storage of information. The operations should be built upon live network data. Where relevant, consideration should be given to SMEs as the ultimate recipients of cybersecurity operational information.

A key element is the translation of advanced AI/ML, data analytics and other relevant cybersecurity tools from research results to operational tools, and further testing and validating them in real conditions in combination with access to supercomputing facilities (e.g., to boost the correlation and detection features of cross-border platforms).

Another key role for National SOCs is knowledge transfer, such as training of cybersecurity analysts. For example, SOCs dealing with critical infrastructures play a key role and should benefit from the knowledge and experience acquired by or concentrated in National SOCs.

National SOCs must share information with other stakeholders in a mutually beneficial exchange of information and commit to apply to participate in a cross-border SOC platform within the next 2 years, with a view to exchanging information with other National SOCs.

To achieve this aim, a call for expression of interest will be launched to select entities in Member States that provide the necessary facilities to host and operate National SOCs. Applicants to the call for expressions of interest should describe the aims and objectives of the National SOC, describe its role and how such role relates to other cybersecurity actors, and its eventual cooperation with other public or private cybersecurity stakeholders. Applicants should also provide the detailed planning of the activities and tasks of the National SOC, the services it will offer, the way they will operate and be operationalised, and describe the duration of the activity as well as the main milestones and deliverables. They should also specify what equipment, tools and services need to be procured and integrated to build up the National SOC, its services and its infrastructure.

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To support the above activities of a National SOC, the following two workstreams of activities are foreseen:

[Procurement] A Joint Procurement Action with the Member State where the national SOC is located: this will cover the procurement of the main equipment, tools and services needed to build up the National SOC[Building up and running the National SOC] A grant will also be available to cover, among others, the preparatory activities for setting up the National SOC, its interaction and cooperation with other stakeholders, as well as the running/operating costs involved, enabling the effective operation of the National SOC, e.g., using the equipment, tools and services purchased through the joint procurement. These will also indicate milestones and deliverables to monitor progress.

Applications shall be made to both workstreams. Applications will be object of evaluations procedures. Grants will only be awarded to applicants that have succeeded the evaluation of the joint procurement action.

These actions aim at creating or strengthening national SOCs, which occupy a central role in ensuring the (cyber-)security of national authorities, providers of critical infrastructures and essential services. SOCs are tasked with monitoring, understanding and proactively managing cybersecurity threats. In light of the crucial operative role of SOCs for ensuring cybersecurity in the Union, the nature of the technologies involved as well as the sensitivity of the information handled, SOCs must be protected against possible dependencies and vulnerabilities in cybersecurity to pre-empt foreign influence and control. As previously noted, participation of non-EU entities entails the risk of highly sensitive information about security infrastructure, risks and incidents being subject to legislation or pressure that obliges those non-EU entities to disclose this information to non-EU governments, with an unpredictable security risk. Therefore, based on the outlined security reasons, the actions relating to SOCs are subject to Article 12(5) of Regulation (EU) 2021/694, in consistency with WP 2021/2022.

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# **16. DIGITAL-ECCC-2024-DEPLOY-CYBER-07-SOCPLAT (DIGITAL-JU-SIMPLE)** Enlarging existing or Launching New Cross-Border SOC Platforms

| Status | Opening date | Deadlines    | Funding type                                     | Keywords |
|--------|--------------|--------------|--|----------|
| Open   | 4 juil. 2024 | 27 mars 2025 | DIGITAL-JU-SIMPLE<br>DIGITAL JU Simple<br>Grants |          |

#### URL in Kaila:

#### Click here

#### Description:

Expected Outcome:World-class cross-border SOC platforms across the Union for pooling data on cybersecurity threat between several Member States, equipped with a highly secure infrastructures and advanced data analytics tools for detecting, gathering and storing data on cybersecurity threats, analysing this data, and sharing and reporting CTI, reviews and analyses.Sharing of Threat Intelligence between National SOCs, and information sharing agreements with competent authorities and CSIRTs. Objective:

The general objective of cross-border SOC platforms is to strengthen capacities to analyse, detect and prevent cyber threats and to support the production of high-quality intelligence on cyber threats, notably through the exchange of data from various sources, public and private, as well as through the sharing of state-of-the-art tools and jointly developing cyber detection, analysis, and prevention capabilities in a trusted environment.

This action aims at new cross-border SOC platforms, as well as supporting those that were already launched under the previous DIGITAL work programme (2021-2022). While the main focus of this action is on processes and tools for prevention, detection and analysis of emerging cyber-attacks, it also foresees in particular the acquisition and/or adoption of common (automation) tools, processes and shared data infrastructures for the management and sharing of contextualised and actionable cybersecurity operational information across the EU. Scope:

Cross-border SOC platforms will contribute to enhancing and consolidating collective situational awareness and capabilities in detection and CTI, supporting the development of better performing data analytics, detection, and response tools, through the pooling of larger amounts of data, including new data generated internally by the consortia members.

The platforms should act as a central point allowing for broader pooling of relevant data and CTI, enable the spreading of threat information on a large scale and among a large and diverse set of actors (e.g., CERTs/CSIRTs, ISACs, operators of critical infrastructures).

Also, for cross-border SOC platforms, there is a crucial need for novel tools based on advanced Artificial Intelligence and machine learning (AI/ML), data analytics and other relevant cybersecurity relevant technologies, based on research results and further tested and validated in real conditions, in combination with access to supercomputing facilities (e.g., to boost the correlation and detection features of cross-border platforms).

The platforms will support common situational awareness and effective crisis management and response by providing relevant information to networks and entities responsible for cybersecurity operational cooperation and crisis management at Union level, without undue delay, where they obtain information related to an ongoing large-scale, cross-border incident, or to a major threat or a major vulnerability likely to have significant cross-border impacts or significant impacts on services and activities falling within the scope of the Directive (EU) 2022/2555.

A call for expression of interest will be launched to select entities in Member States that provide the necessary facilities to host and operate Cross-Border SOC platforms for pooling data on cybersecurity threat between several Member States. Applicants to the call for expressions of interest should describe the aims and objectives of the Cross-Border SOC platform, describe its role and how such role relates to other cybersecurity actors, and its eventual cooperation with other public or private cybersecurity stakeholders. Applicants should also provide the

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detailed planning of the activities and tasks of the Cross-Border SOC platform, the services it will offer, the way they will operate and be operationalised, and describe the duration of the activity as well as the main milestones and deliverables. They should also specify what equipment, tools and services need to be procured and integrated to build up the Cross-Border SOC platform, its services and its infrastructure.

To support the above activities of a Cross-Border SOC platform, the following two workstreams of activities are foreseen: [Procurement] A Joint Procurement Action with the Member State participating in the Cross-Border SOC platform: this will cover the procurement of the main equipment, tools and services needed to build up the Cross-Border SOC platform.[Building up and running the Cross-Border SOC platform] A grant will also be available to cover, among others, the preparatory activities for setting up the Cross-Border SOC platform, its interaction and cooperation with other stakeholders, as well as the running/operating costs involved, enabling the effective operation of the Cross-Border SOC platform, e.g., using the equipment, tools and services purchased through the joint procurement. These will also indicate milestones and deliverables to monitor progress.

Applications shall be made to both workstreams. Applications will be object of evaluations procedures. Grants will only be awarded to applicants that have succeeded the evaluation of the joint procurement action.

These actions aim at creating or strengthening cross-border SOCs, which occupy a central role in ensuring the (cyber-)security of national authorities, providers of critical infrastructures and essential services. SOCs are tasked with monitoring, understanding and proactively managing cybersecurity threats. In light of the crucial operative role of SOCs for ensuring cybersecurity in the Union, the nature of the technologies involved as well as the sensitivity of the information handled, SOCs must be protected against possible dependencies and vulnerabilities in cybersecurity to pre-empt foreign influence and control. As previously noted, participation of non-EU entities entails the risk of highly sensitive information about security infrastructure, risks and incidents being subject to legislation or pressure that obliges those non-EU entities to disclose this information to non-EU governments, with an unpredictable security risk. Therefore, based on the outlined security reasons, the actions relating to SOCs are subject to Article 12(5) of Regulation (EU) 2021/694, in consistency with WP 2021/2022.

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## 17. ERASMUS-EDU-2025-PI-FORWARD-ADULT-CG (ERASMUS-LS)

# Topic 5: Adult learning: Improving career guidance to support adults' participation in training

| Status | Opening date | Deadlines   | Funding type     | Keywords |
|--------|--------------|-------------|------------------|----------|
| Open   | 18 déc. 2024 | 27 mai 2025 | ERASMUS-LS       |          |
|        |              |             | ERASMUS Lump Sum |          |
|        |              |             | Grants           |          |

#### URL in Kaila:

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#### **Description:**

Scope:

Projects under this priority will identify and test methods and mechanisms to improve guidance and counselling services to adults, with a particular focus on reaching out to and supporting workers in small and micro-enterprises, at all levels, including management. Ideally projects should devise approaches that have the potential of becoming mainstreamed.

Projects should support guidance services:

• Providing coordinated services offering skills assessment, directing individuals to tailor-made learning options, with validation of the acquired skills.

• Improving the career management skills of individuals.

• Making use of skills intelligence and digital tools, including artificial intelligence, in career guidance to capitalise on new efficiencies and scale.

• Supporting employers to identify which skills their enterprises will need and how they can support their employees to assess and acquire these skills.

• Reinforcing career guidance counsellors' training and competence development so that they can support individuals to unlock their full potential.

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# **18. HORIZON-SESAR-2025-DES-IR-02-WA4-1 (HORIZON-JU-RIA)** Next generation ATS platform for airport operations

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

#### URL in Kaila:

#### <u>Click here</u>

#### Description:

Expected Outcome:

To significantly advance the following development actions:

IR-4-01 Next generation airport platform addresses the next generation airport platform fully leveraging aircraft capabilities. This includes supporting the data-sharing service delivery model, interconnected with other airports and their 3rd parties (e.g. ground handlers), ANSPs, NM, CNS/MET as a service, etc., facilitating the accommodation of IAM, the interface with U-space as well as specific needs from the military.IR-4-02 Artificial intelligence (AI) capabilities enabling the next generation of airport platforms.IR-4-03 Cyber-resilience and cyber-security capabilities enabling the next generation of airport platforms.IR-4-04 Airport solutions for reducing environmental impact operations. This includes sustainable taxi related concepts, environmental performance dashboards, etc.IR-4-05 Future human – machine teaming.IR-4-06 Optimisation of runway throughput.IR-1-01 Integrated air/ground trajectory management based on ATS-B2 including the extension for lower airspace and airport surface.

This includes advancing the capabilities of the following systems:

Ground systems: core ATS platform for airport operations. Scope:

Research aims at developing the next generation of airport platforms, considering state-of-the-art ground technologies while leveraging innovative solutions and new aircraft capabilities aiming to achieve level 4 of automation as outlined in the Master Plan and by considering a trustworthy AI approach. The targeted airport platforms shall enable the following capabilities:

Ensuring that all flights/missions (crewed or uncrewed) operate in the airport and in adjacent airspace in a way that maximises, to the fullest extent, aircraft capabilities to reduce the overall climate impact of aviation (CO2 and non-CO2) (see detailed R& I needs below). Ensuring that each flight trajectory is optimised considering the individual performance characteristics of each aircraft, user preferences, real-time traffic, local circumstances, and meteorological conditions at the airport. This optimisation shall be systematic, continuous (from planning to execution), and extremely precise throughput is improved in high demand scenarios (see detailed R& I needs below). Intelligent surface management and airport safety nets maintain airport operations safe in all weather conditions while runway throughput is improved in high demand scenarios (see detailed R& I needs below). Service providers can dynamically and collaboratively scale capacity up or down in line with demand by all airspace users. These capacity adjustments are implemented in real time and ensure optimal and efficient dual (both civil and military) use of resources at any moment at the airport (data, infrastructure, and human-machine teaming). Endpoints, data connection and ecosystem are cybersecure thanks to enhancement to key properties of information security such as, but not limited to, strong identification, authentication and integrity. Post-quantum cryptography (PQC) algorithms[1] should be considered where appropriate, ensuring cyber-resilience risks are adequately managed. Collaboration among airports and system manufacturers will enable an enhanced cybersecurity in the next generation of ATS platforms. Research shall consider the on-going work by ICAO on the international aviation trust framework (IATF), which aims at developing standards and harmonised procedures for a digitally seamless sky and dependable information exchange between all parties. The contribution during airport operations to the continuous optimisation of every flight/mission from gate to gate is systematically guaranteed thanks to high connectivity between air-ground and ground-ground components. The human operator is performing only the tasks that are too complex for automation to manage, teaming up with automation (see automation roadmap of the Master Plan).Air-ground voice communication is no longer the primary way of communicating and most routine tasks should be managed through machine-to-machine applications. To enable TBO phase 3 in a highly automated airport environment in accordance with the TBO and automation roadmaps in the ATM MP (see detailed R&I needs below).

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Specific minimum requirements for this topic:

Consortia for this topic shall include:

At least three airports. Either include an established ATS airport system manufacturer or provide evidence that the consortium has the operational and technical capability to build the ATS airport system prototypes required for the research at the required maturity level. The proposed target architecture shall be aligned with the service delivery model outlined in the Master Plan.

Detailed R&I needs to enable TBO Phase 3 to be considered:

The following list of detailed R& I needs is proposed as an illustration of the potential project content, but it is not meant as prescriptive.

Proposals may include other research elements beyond the proposed research elements below if they are justified by their contribution to achieve the expected outcomes of the topic and are fully aligned with the development priorities defined in the European ATM Master Plan. ADS-C standard instrument departure (SID) conformance monitoring on the airport surface

This element covers the conformance check that the correct SID is loaded on the FMS based on the ADS-C downlink. This is a safety net that functions automatically in the background. The aim is to preserve safety in a more flexible environment where environmental constraints may result in SID allocation becoming less predictable than in the past.

Use of ATS B2 CPDLC v2/v4 on the airport surface

This solution covers the development of the ATC ground systems, in support of the use of CPDLC on the airport surface. This includes an enhancement of the D-TAXI capabilities to allow the use of CPDLC to uplink taxi clearances when the aircraft is already taxiing, as well as for the uplink of a revised departure route at any point after the aircraft has left the gate until shortly before take-off. The request for the uplink of a revised SID will typically be sent from the TMA systems to the TWR systems. The new departure route could be a SID (i.e., one of the published departure routes from the airport) or a custom-made departure route (e.g., a published SID but with vertical constraints aimed at facilitating a better climb profile). This increased flexibility will make it possible to uplink departure routes shortly before take-off with vertical constraints to ensure separation with other aircraft so that aircraft fly more efficient vertical profiles. This applies in particular to the tactical uplink shortly before take-off of departure routes that ensure separation between departures and/or arrivals to/from the same or proximate airports based on actual traffic rather than SIDs being loaded at the gate assuming a worse-case scenario.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 4) and the airborne prototypes (covered in WA 5).

Enhanced optimised and safe runway delivery for arrivals and departures

Enhanced optimised separation delivery for arrivals and departures using more accurate flight-specific predictions of final speed profiles derived from either an evolved extended flight plan or an EPP downlinked from the aircraft using ADS-C or advanced big data / ML techniques. Research may include automatic real time wake turbulence separation on departure based on LIDAR and its integration on ATS platform. This requires the development of SWIM based meteorological services as automatic input to separation and runway delivery tools employed to manage arrivals and departures at capacity constrained airports. The research element covers the possibility to operate time-based separation, which provides valuable extra landing capacity and resilience, with RNP-defined approaches. Research may consider the application of digitised augmentation to expedite decision making. Research shall consider the work performed by project PJ.02-W2 in SESAR 2020 (e.g., SESAR solutions PJ.02-W2-14.8, PJ.02-W2-14.14, PJ.02-W2-14.7, PJ.02-W2-14.9a, PJ.02-W2-14.10, PJ.02-W2-14.11, PJ.02-W2-14.6a, PJ.02-W2-14.6b, MIAR solution 0336). This research element also covers the development of enhanced ground based surveillance sensors or sensor fusion architectures able to detect obstacles on or near the runway or predict potential runway incursions, including ATC aids for comparing traffic movement with automated recognition of ATC voice and future datalink-based clearances (work is on-going in project ASTONISH).

#### Advanced calibration of airport capacity

The ATFM declared capacity of an airport is the maximum number of aircraft that can be allocated a pre-departure time of arrival (TTA) in a given time slot. It considers the runway throughput and the uncertainty of traffic demand data: the higher the uncertainty, the higher the buffer in the declared capacity needs to be to ensure that there will be no holes in the sequence due to under-delivery. Uncertainty of traffic demand data not only affects to the declared airport capacity, but also to the staffing. An accurate hourly traffic demand is essential to predict how many ATC positions are needed to be opened at the tower every hour, and therefore, the necessary staff. Research aims at developing a solution aimed at leveraging the reduced traffic uncertainty brought by SESAR developments by reducing the declared capacity or traffic movements. Thanks to the reduced buffer, aircraft will have lower arrival

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sequencing and metering (ASMA) delay, which will result in environmental benefits.

Integrated management of single-engine and engine-off taxiing operations

In engine-off or single engine operations, one or more of the main aircraft engines are started in the taxi-out phase instead of at the gate. Doing so at the right time, neither too early (missing some engine-off taxi time benefits) nor too late (creating extra taxi-out time and potentially disrupting the departure sequence), is essential to maximise the environmental benefits, but this can be challenging at medium and large A-CDM airport environments at peak demand times.

#### The research should address:

Management of single engine taxiing operations, autonomous and non-autonomous engine-off taxiing operations. This includes the direct management of tugs or the coordination with the tug manager service for airports where this service is available. Mixed operations aspects: engine-off taxiing vs. conventional taxiing, different engine-off taxiing techniques in the same operating environment. The synchronisation of the engine start-up and target take-off time (TTOT). Scalability aspects depending on the different airport categories where the solution(s) could be implemented. Impacts on other airport systems (e.g. airport operations centre (APOC), advanced surface movement guidance and control system (A-SMGCS), etc.).

Research shall consider the output of project AEON.

Management of non-autonomous engine-off taxiing operations by tug fleet manager

Research aims at developing the concept of tug fleet manager in the context of non-autonomous engine-off taxiing operations. The tug fleet manager is a new role between airport management and air traffic control who oversees the implementation of the tug's allocation plan during the non-autonomous engine-off taxiing operations. The tug fleet manager assigns their missions to tugs drivers in real time and adapts the tugs planning to any operational events (e.g., delays, failures, etc.).

The tug fleet manager will help managing the additional traffic on taxiways caused by the tugs and optimising the tugs usage. Hence it will provide following benefits: fuel and noxious emissions reduction, ground ATC workload for tow tugs management reduction and more precise sequencing with taxi times depending on actual taxiing technique and real time update. Research shall take into consideration the results of project AEON. Note that there is on-going work by project ASTAIR.

Data exchange between TWR and En-Route and TMA platforms

The existing differences in handling the essential flight plan (FPL) information between TWR and En-Route and TMA platforms result in a number of workarounds used by the ANSP or vendors to close the gap on TWR - APP/ACC systems connectivity, resulting in subsequent problems with provision of the departure sequence or other coordination elements. Going further, since the TWR systems will have to facilitate the IAM elements, research aims at evaluating and determining which information and how should be exchanged between TWR and APP systems, enabling seamless coordination.

[1] https://digital-strategy.ec.europa.eu/en/library/recommendation-coordinated-implementation-roadmap-transition-post-quantum-cryptography.

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# 19. 3rd 6G-XR Open Call - Vertical Replicability enablers ()

### 3rd 6G-XR Open Call - Vertical Replicability enablers

| Status | Opening date | Deadlines                     | Funding type | Keywords |
|--------|--------------|-------------------------------|--------------|----------|
| Open   | 1 déc. 2024  | 10 janv. 2025, 7 mars<br>2025 |              |          |

#### URL in Kaila:

<u>Click here</u>

#### **Description:**

Submission & evaluation process:

Before submitting the proposal, please download and carefully read the provided documentation and templates through the link below:

https://www.6g-xr.eu/open-calls/oc3/

The proposal must be submitted in English and through the 6G-XR online form that is located on the same page.

All form fields should be filled with no exceptions.

A Feasibility Check is required before submission. Proposers MUST submit their draft proposal by Friday 10 January 2025 @17:00 CET (for more details see Section 4.4).

Once the deadline for submitting a proposal is reached, the call will be closed, and the evaluation process will start. The duration of the evaluation of the proposals and approval by the EU is planned to be kept within 1,5 months. The outcome of the evaluation will be communicated to the proposers via email as soon as the process is completed. The notification will include a report of the evaluation process where for each criterion the score and the motivation of the evaluators will be reported.

It is highly recommended to submit your proposal well before the deadline. If the proposer discovers an error in their submitted proposal, and provided that the call deadline has not passed, the proposer can re-submit it (for this purpose please contact us at opencalls@6g-xr.eu).

Failure of the proposal to arrive within the deadline for any reason, including network communications delays or working from multiple browsers or multiple browser windows, is not acceptable as an extenuating circumstance.

Selected experiments can start at the earliest on End April 2025. Please note that a later start may imply a shorter experiment.

The Open Call proposers are encouraged to contact the 6G-XR consortium and share their intentions in order to verify the feasibility of their

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proposals to be implemented in the scope of the project. The Feasibility Check will be carried out by the 6G-XR consortium partners acting as Mentor organisations with the support of other partners as needed. The description of the experimental facilities in Section 2 of this document provides insights of the state and targets of each of the facilities and hence proposals should adhere to those targets. Initial feedback will be provided for the proposed planned activities. In order to be eligible and receive feedback, a description of planned experiment (sections A, B, C and J of the proposal template) must be submitted through the 6G-XR Open Call Submission Tool on the project's website by the designated deadline https://6g-xr.eu/open-calls/oc3/. Under the tab 'Stage', please select the option 'Feasibility Check' in order to submit your proposal for a Feasibility Check.

If you have submitted your proposal under the 'Feasibility Check' option, it will not be considered as a final submission and will not be evaluated.

Actual Feasibility Check of the proposal will be conducted after the submission deadline.

The proposals for final submission shall be submitted through the 6G-XR Open Call Submission Tool on the project's website by the designated deadline https://6g-xr.eu/open-calls/oc3/ under the 'Stage' tab, select 'Final Submission'.

A proposal will be considered eligible for the 3rd 6G-XR Open Call if it complies will ALL the following rules:

The proposal is submitted by a legal entity established and based in one of the EU Member States or a Horizon Europe Associated country. The targeted organisations in this Call are (i) SMEs; (ii) Industry; (iii) Research/scientific organisation; (iv) Academia.The proposal is submitted by a single party. The submission of proposals by consortia is not eligible.The proposer CANNOT BE AFFILIATED TO ANY OF THE CONSORTIUM PARTNERS OF THE 6G-XR PROJECT.The proposal complies with the type of activity qualified for financial support: (i) Personnel costs; (ii) Travel costs (including travel for a live demo at the end of the project); (iii) Indirect costs (25% of the direct costs). No other cost categories are eligible.The proposal is submitted in English.The proposal is submitted through the official Open Call Submission Tool on the 6G-XR website providing all the required documents (completed proposal template and declaration of honour).Feasibility Check submission is mandatory, and for Feasibility Check must include at least the following sections:Section A Project Sum mary,Section B Detailed description and expected results,Section C Usage of 6G-XR research infrastructures,Section J Ethical and Privacy Framework) before the Feasibility check deadline.

Proposals failing submission for feasibility will not be evaluated.

The proposal has been submitted within the deadline set in this document. Late proposals will not be admitted. The proposal complies with the Regulation (EU) 2016/679 (General Data Protection Regulation) regarding all personal data that might be included in the proposal.

Proposals submitted by Parties meeting the requirements will be further evaluated according to the following criteria: Clarity and methodology: Soundness of the approach and credibility of the proposed methodologyAmbition: Advancement regard the stateof-the-art and expected output.Impact: Technology and domain fit to 6G-XR scope and objectives.Replicability of the proposed solution.Contribution to standardisation of the proposed solution.Team capacity to perform; knowledge, technological and business expertise; commitment; research domain & track-record.Value for money: quality and effectiveness of the requested resources.SME participation is encouraged.Gender dimension awareness requested to the proposers.Maturity/trajectory of the proposing

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organization/proposed development in the specific field of their proposal. Further information:

Important information is already included in the available 3rd 6G-XR Open Call documents (Information Document, Proposal Template, Declaration of Honour, Draft Third Party Agreement). Please review thoroughly these documents as well as the Frequently Asked Questions section of the 3rd 6G-XR Open Call page.

If the answer to your question cannot be found in the documentation, you can send your question to the following email address: opencalls@6g-xr.eu. In case your question refers to technical details of the offered research infrastructure, you can send your question to the same email address

opencalls@6g-xr.eu, clearly mentioning which infrastructure the question relates to. Questions can be sent at the latest seven calendar days before the submission deadline.

#### Task description:

In this third wave of Open Calls, third parties are invited to submit projects that qualify for receiving financial support that leverage 6G-XR's enablers, infrastructure facilities and testbeds to deploy, replicate and validate the verticals of their interest. This is strongly aligned with, and enabled by, key expected outcomes of the project:

modular, flexible and interoperable enablers to replicate and/or realize any service, application or vertical of interest, beyond the internal 6G-XR validation use cases; and comprehensive and accurate modules for determining cross-layer performance- and value-oriented metrics, and smart orchestration and decision making to trigger efficient adaptations.

Candidate media / XR services for selection include but are not limited to: (i) novel delivery paradigms (e.g., one-to-many, many-to-many) for traditional and immersive media; (ii) metaverse-like services; (iii) gaming-like services; (iv) interactive and distributed AR/XR/VR services; (v) adaptation of classical audio-visual services to assess the benefits of 6G(-XR) technology.

The infrastructures are divided between the North and South Node. There are also some themes that are relevant to both nodes, such as Artificial intelligence. In addition, 6G-XR has identified some verticals that are considered complimentary to the internally developed Use Cases and can serve as examples of verticals that are welcome to this Open Call within the South Node:

6G-XR-OC3-TOP1.1: Full-fledged multimedia platforms / services providing new encoding and streaming solutions for Holographic Communications [Mentor: VICOM, i2CAT]6G-XR-OC3-TOP1.2: Training and education, by using immersive platforms that support rich interaction and collaboration between distributed users [Mentor: i2CAT]6G-XR-OC3-TOP1.3: Culture visits and events, by using immersive platforms that support real-time tele-portation to a virtual place or an event, and rich interaction therein. [Mentor: i2CAT]6G-XR-OC3-TOP1.4: Smart Industry / Spaces, by using immersive platforms that support rich data sharing, manipulation of digital twins, and/or remote collaboration. [Mentor: i2CAT]6G-XR-OC3-TOP1.5: Interactive multiuser multi-sensory experiences, by integrating multiple data modalities beyond audio and video. [Mentor: i2CAT]6G-XR-OC3-TOP1.6: Energy immersive platforms for virtual testing and evaluation [Mentor: CGE] 6G-XR-OC3-TOP1.7: Cooperative, Connected and Automated Mobility (CCAM) in micro-mobility scenarios. [Mentor: i2CAT]

For the purpose of this 3rd Open Call, 6G-XR has identified some verticals that are considered complimentary to the internally developed Use Case 4: Collaborative 3D Digital Twin-like Environment within the North Node:

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6G-XR-OC3-TOP2.1: Simulation and prediction; Prototyping simulation, Predictive maintenance in Industry. [Mentor: UOULU]6G-XR-OC3-TOP2.2: Training and Education; Operational training, remote collaborative operations in education, medicals. [Mentor: UOULU]6G-XR-OC3-TOP2.3: Visualization and data sharing; visualization of complex system and environment, real-time data dashboard in smart media, smart city, smart agriculture. [Mentor: UOULU]

For the purpose of this 3rd Open Call, 6G-XR has identified some verticals that are considered complimentary to the internally developed Use Case 5: Energy Measurement Framework for Energy Sustainability within the North Node:

6G-XR-OC3-TOP3.1: Utilization of open data in the optimization of RAN energy usage [Mentor: UOULU, VTT]6G-XR-OC3-TOP3.2: End-to-end energy budgeting for the sustainable mobile network infrastructure [Mentor: UOULU, VTT]6G-XR-OC3-TOP3.3: Visualization of mobile network measurement data [Mentor: UOULU, VTT]6G-XR-OC3-TOP3.4: Calibrations, validations, and verification of energy measurement data [Mentor: VTT]

In addition to the previous complementary verticals directly related to the 5 internal Use Cases, 6G-XR has identified an cross-cutting theme that extends beyond the internally developed use cases: Artificial Intelligence. Applicants are welcome to submit proposals for both the South and North nodes.

6G-XR-OC3-TOP4.1: Al supervised manufacturing (UOULU Mentor UOULU, VTT, CGE, I2CAT)6G-XR-OC3-TOP4.2: Distributed Al for Energy [Mentor: CGE]

However, this third and final Open Call welcomes any other vertical or different Use Cases under any other relevant vertical under topic 6G-XR-OC3-TOP5.1: Open vertical replicability [Mentor: Based on the selected infrastructure]

Please note that a minimum of one and a maximum of four proposals will be funded per infrastructure.

The use of an alternative infrastructure may be negotiated if the chosen infrastructure is unavailable/unbalanced in terms of available resources.

Expected duration of participation: 6 months

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# 20. ERASMUS-EDU-2025-PI-ALL-INNO-EDU-ENTERP (ERASMUS-LS)

### Alliances for Education and Enterprises

| Status | Opening date | Deadlines   | Funding type                             | Keywords |
|--------|--------------|-------------|--|----------|
| Open   | 5 déc. 2024  | 6 mars 2025 | ERASMUS-LS<br>ERASMUS Lump Sum<br>Grants |          |

#### URL in Kaila:

#### <u>Click here</u>

#### Description:

#### Scope: ALLIANCES FOR INNOVATION

Alliances for Innovation aim to strengthen Europe's innovation capacity by boosting innovation through cooperation and flow of knowledge among higher education, vocational education and training (both initial and continuous), and the broader socio-economic environment, including research.

They also aim to boost the provision of new skills and address skills mismatches by designing and creating new curricula for higher education (HE) and vocational education and training (VET), supporting the development of a sense of initiative and entrepreneurial mind-sets in the EU.

#### OBJECTIVES OF THE ACTION

These partnerships shall implement a coherent and comprehensive set of sectoral or cross-sectoral activities, which should be adaptable to future knowledge developments across the EU.

To boost innovation, the focus will be on talent and skills development. Firstly, digital competences have become increasingly important in all job profiles across the entire labour market. Secondly, the transition to a circular and greener economy needs to be underpinned by changes to qualifications and national education and training curricula to meet emerging professional needs for green skills and sustainable development. Thirdly, the twin digital and green transition requires an accelerated adoption of new technologies, in particular in the highly innovative deep tech domains, across all sectors of our economy and society.

The objectives of Alliances for Innovation can be achieved by applying to one or both Lots (If interested in Lot 2: Alliances for Sectoral Cooperation on Skills (implementing the 'Blueprint')) please refer to the dedicated Call Web page on the EU Funding and Tenders Portal. An organisation can be involved in several proposals):

#### Lot 1: Alliances for Education and Enterprises

Alliances for Education and Enterprises are transnational, structured and result-driven projects, in which partners share common goals and work together to foster innovation, new skills, a sense of initiative and entrepreneurial mind-sets.

They aim to foster innovation in higher education, vocational education and training, enterprises and the broader socio-economic environment. This includes confronting societal and economic challenges such as climate change, changing demographics, digitisation, the emergence of new, disruptive (deep tech) technologies such as artificial intelligence and rapid employment changes through social innovation and community resilience as well as labour market innovation.

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Link to Kaila's general terms



Alliances for Education and Enterprises bring together enterprises and both higher education and vocational training providers to work together in partnership. Operating within one economic sector or several different economic sectors, they create reliable and sustainable relations and demonstrate their innovative and transnational character in all aspects. While each partnership must include at least one VET and one higher education organisation, they can address either both or one of these educational fields. The cooperation between VET and higher education organisations should be relevant and should benefit both sectors.

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### 21. HORIZON-SESAR-2025-DES-ER-03-WA1-4 (HORIZON-JU-RIA)

### Fundamental research for other topics

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

#### URL in Kaila:

#### <u>Click here</u>

#### Description:

#### Expected Outcome:

Fundamental research is typically curiosity-driven and explores new and innovative research areas for air traffic management (ATM), which are at TRLO. The objective is to bring new knowledge encouraging scientists to develop innovative ideas, concepts, emerging technologies, methods, and theories that explore the current boundary of knowledge on ATM/U-space and that have potential for the evolution of the future air traffic management / U-space system. Exploration of the potential benefits of the application of interdisciplinary methods is considered positive and in scope.

#### Scope:

The scope under this topic covers any ATM/U-space research area not covered by the development priorities for fundamental research (FR-1, FR-2 or FR-3) described in previous topics.

The proposals shall demonstrate their innovation / breakthrough potential, justify how the scope of the proposed research is aligned to the ATM Master Plan vision and how the expected outcomes will contribute to one or more of the five key transformation levers described in the ATM Master Plan.

The five transformation levers are described in the ATM Master Plan as follows:

Trajectory optimisation: the proposed research shall contribute to guarantee a systematic, continuous, and precise optimisation of all aircraft trajectories throughout their lifecycle, from planning to execution, from gate to gate and within the context of congested airspace.Data volumes: the proposed research shall contribute to collect and process large volumes of data (e.g., aircraft performance characteristics, user preferences, real time traffic information and meteorological information throughout the network, etc.). Increased real-time sharing of secure and trusted data will enable airborne and ground systems and actors to stay interconnected and share the same situational awareness. Automation: the proposed research shall contribute to realise an effective teaming up of human operators and systems (i.e., human-machine teaming), which will be necessary to make best use of a large volume of data to optimise trajectories. To that end, higher levels of automation will be introduced in ATM. This requires advanced artificial intelligence (AI)-powered digital support tools, to deal safely with complex decision-making while optimising capacity and environmental performance.Dynamic airspace: the proposed research shall contribute to realise uses of flight, the system will be fully automated and able to handle both nominal and non-nominal situations.Role and function of human operators: the proposed research shall contribute to the gradual evolution of the role and skills of the human operator (e.g., air traffic controllers, air traffic safety electronic personnel, flight crew and operators, etc.), as well as the emergence of new roles.

When relevant and regarding civil military collaboration, the proposed research shall contribute to enhance military access to the airspace and to the ability to protect confidentiality and critical information of military air missions. In addition, it could address the coordination with civilian aviation authorities enabling effective contribution to operations in multinational coalitions and the adaptation of Military systems and CNS capabilities to ensure civil military interoperability. The military implications of U-Space and higher altitude operations (HAO) could also be included.

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# **22. DIGITAL-ECCC-2024-DEPLOY-CYBER-07-SOCSYS (DIGITAL-JU-CSA)** Strengthening the SOC Ecosystem

| Status | Opening date | Deadlines    | Funding type   | Keywords |
|--------|--------------|--------------|--|----------|
| Open   | 4 juil. 2024 | 27 mars 2025 | DIGITAL-JU-CSA<br>DIGITAL JU Coordination<br>and Support Actions |          |

#### URL in Kaila:

#### <u>Click here</u>

#### Description:

Expected Outcome: Events, workshops, stakeholder consultations, architectural designs and white papers on technical coordination and interconnection support platforms. Stronger links between public sector and industry SOCsTechnical frameworks to allow for information exchange between SOC platforms. A blueprint for the use of HPC facilities for the benefit of SOCs Objective:

This topic complements other actions in this and the previous Work Programme, which are building up National SOCs and Cross-Border SOC platforms. It will empower SOCs which are linked to National SOCs, and to a stronger collaboration between local SOCs, National SOCs and Cross-Border SOC platforms, leading to an increased data sharing and better detection capability for cyber threats. This should in particular foster interoperability, identifying what data can be shared, how this is shared and in what format, requirements and sharing agreements, and ways to enable better exchange. Links to the actions funded under the Cybersecurity Skills Academy (in the main Digital Europe work programme) can also be envisaged.

These actions should lead to increased engagement, including from the private sector, and to a better collaboration towards a common EU cyber threat knowledge base and technological independence.

Additionally, Cross-Border SOC Platforms will develop a comprehensive governance framework, with for example enrolment conditions and vetting procedures. The aim is to foster discussion between such platforms, sharing best practices and identifying opportunities for collaboration.

One Coordination and support action will be selected, bringing together the largest possible network of National and Cross-Border SOC platforms.

#### Scope:

Actions should address one or more of the following:

Activities and technical frameworks that foster the collaboration and interconnection between Cross-Border SOC platforms and National SOCs, as well as fostering the link between National SOCs and other SOCs at national level. Actions that support the cooperation and coordination of Cross-Border SOC platforms, both between different Cross-Border SOC platforms, and with relation to national SOCs and other SOCs. Actions to foster links between public sector and industry, and stimulate mutually beneficial exchange of information, tools and data as well as exchange of knowledge and training opportunities. Actions to foster links between SOCs and industrial stakeholders in artificial intelligence and in other enabling technologies, fostering the adoption of such technologies, including Al techniques and tools rand facilitating getting acquainted with existing state of the art tools (such as for example those developed in Action 1.1.4 of this work programme) and knowledge exchange. Actions to engage stakeholders from the HPC stakeholder community and practitioners of breakthrough Al technologies, to develop a blueprint for the requirements of Al models that necessitate access to large or smaller HPC facilities, and next steps to make this happen, as well as raising awareness of this in the wider SOC community.

These actions aim at creating or strengthening national and/or cross-border SOCs, which occupy a central role in ensuring the (cyber-)security of national authorities, providers of critical infrastructures and essential services. SOCs are tasked with monitoring, understanding and proactively managing cybersecurity threats. In light of the crucial operative role of SOCs for ensuring cybersecurity in the Union, the nature of the technologies involved as well as the sensitivity of the information handled, SOCs must be protected against possible

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dependencies and vulnerabilities in cybersecurity to pre-empt foreign influence and control. As previously noted, participation of non-EU entities entails the risk of highly sensitive information about security infrastructure, risks and incidents being subject to legislation or pressure that obliges those non-EU entities to disclose this information to non-EU governments, with an unpredictable security risk. Therefore, based on the outlined security reasons, the actions relating to SOCs are subject to Article 12(5) of Regulation (EU) 2021/694.

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# **23. HORIZON-EUROHPC-JU-2024-INCO-06 (HORIZON-JU-RIA)** EuroHPC International Cooperation

| Status | Opening date | Deadlines     | Funding type  | Keywords |
|--------|--------------|---------------|---|----------|
| Open   | 19 nov. 2024 | 27 févr. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

#### URL in Kaila:

#### <u>Click here</u>

#### Description:

#### Expected Outcome:

To strengthen the European quantum computing R&D ecosystem through cooperation with the Japanese ecosystem, proposals are expected to contribute to the following outcomes:

Enhanced quantum computing and/or hybrid Quantum-High Performance Computing (HPC) algorithms and codes in advanced academic and industrial applications of interest for Europe and Japan in the identified priority domains described in the scope section below.Improved sharing of information and expertise to solve common societal problems with the use of advanced hybrid quantum-HPC and/or quantum computing.An effective exchange of researchers and engineers between Japan and the EU and their access to advanced Japanese and EuroHPC quantum computing and/or hybrid Quantum-HPC resources.A roadmap for an improved cooperation of EU-Japan quantum computing research communities on quantum computing and/or hybrid Quantum-HPC algorithmic development in targeted application areas. Objective:

The objective of this call is to support the implementation of the Japan-EU Digital Partnership[1] in order to strengthen cooperation with Japan in quantum computing R&D.

Scope:

Strengthening research cooperation between Europe and Japan in quantum computing collaboration topics under the EU-Japan Digital Partnership. The focus is on cooperation activities for optimising hybrid Quantum-HPC algorithms and codes in advanced academic and industrial applications of common interest including applications related to biomedical, material science, seismic/tsunami and/or weather and climate modelling.

Proposals should address the below identified priority domains of mutual interest, with activities in quantum computing and/or hybrid Quantum-HPC applications (including quantum-inspired computing):

Developing algorithms and codes for material and biomedical sciences including drug discovery, electronic structure problem, crystal structures of organic molecules, quantum chemistry/quantum physics, optimization, and efficiently coupling classical machine learning (ML) or artificial Intelligence with quantum ML.Developing algorithms and codes for seismic/tsunami and/or weather and climate modelling, such as climate change/earthquake forecasting, energy transition (e.g., chemistry and material simulations), decentralized grid energy distribution, emergency, post disaster and logistics management, Earth observation;

Proposals should address one or more of the above application areas, and consider at the same time all of the following: Addressing the software stack as well as error mitigation approaches, including sharing and exchange of use-cases, testbeds, and libraries;Benchmarking and pre-standardisation[2], such as establishing specific benchmarks for technology advancements (e.g., qubit stability, error rates, or processing speed) and application development in the identified priority domains, including performance measuring, testing and optimisation.

Proposals should promote the exchange of researchers and engineers between Japan and the EU and elaborate a roadmap for future R&I actions that would enhance cooperation in all the above. Proposals should also demonstrate a clear link with the existing European quantum computing and/or hybrid Quantum-HPC centres active in the identified priority domains, and possibly include benchmarks related to the efficient use of shared resources, like computing time on shared infrastructures (e.g., EU/EuroHPC supercomputers, JP/ABCI-Q hybrid infrastructure in AIST).

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Finally, proposals should also describe the facilitation of reciprocal access for European and Japanese researchers and engineers to advanced Japanese and EuroHPC quantum computing resources (notably the utilisation of the JP/ABCI-Q hybrid infrastructure in AIST and the EU's EuroHPC quantum computers), in conformity with the respective access policies. It is expected that the EuroHPC JU and the Japanese quantum computing entities will provide dedicated computing time in their respective infrastructure to run quantum computing and/or hybrid Quantum-HPC applications of European and Japanese users in the frame of this action.

For any selected projects under this call, Japanese partners will participate with their own funding, while EU partners will be funded by Horizon Europe.

[1] https://digital-strategy.ec.europa.eu/en/news/eu-japan-summit-strengthening-our-partnership

[2] Preliminary efforts to establish uniform technical standards, benchmarks, and methodologies before formal standardization processes take place.

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# 24. HORIZON-SESAR-2025-DES-ER-03-WA1-3 (HORIZON-JU-RIA)

### Investigate quantum sensing and computing applied to ATM

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

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#### Description:

Expected Outcome:

To significantly advance the following development priority:

FR-3 Investigate quantum sensing and computing applied to ATM. Scope:

1. Quantum computing (QC) applications in ATM

Quantum computing is a domain that integrates computer science, physics, and mathematics. Quantum computing's ability to perform complex calculations at higher speeds than classical computing opens new opportunities for solving complex problems (as ATM related NP-hard problems coming from ATM (e.g., large-scale trajectory planning, airspace configuration optimization, etc.)) in real-time.

It is acknowledged that quantum computers are not yet widely available. The objective of this research element is to explore the advantage of quantum computing in ATM. It is not expected that research will write quantum algorithms or make use of quantum machines. Quantum annealing is also in scope as a short-term, high-yield, low-risk method to quantise existing optimisation algorithms.

Research aims at exploring how quantum computing could be applied in air traffic management and how it could impact ATM. Potential (and non-exhaustive) applications include:

Trajectory optimisation: classical computing methods can find it challenging to compute the most efficient trajectory in real time, especially when considering that flights operate in a very dynamic environment subject to many variables (e.g., air traffic restrictions, weather conditions, changing fuel prices, etc.). Quantum computing could handle multidimensional optimisation problems with higher speed and accuracy than classical computing. These algorithms could help airspace users to identify the most energy-efficient and time-effective trajectories, significantly reducing operational costs and environmental / societal impact. Traffic flow optimisation: quantum computing could help optimising flight schedules and flight plans, and therefore to smoother traffic demand, traffic flows and potential regulations in capacity constrained scenarios. By optimising traffic flows, it could help reducing delays (e.g., ATFCM, drone delivery, etc.) and making a better use of available capacity. Emergency and contingency management: in emergency situations, an efficient and on-time decision-making is crucial. Thanks to its ability to simulate a high number of potential scenarios in a fraction of the time required by classical computing, quantum computing could help defining the best possible strategy to manage an emergency and minimise risk to passengers, flight crew, and aircraft.Separation management: quantum computing could analyse huge datasets from (e.g., radar, satellite, transponder data, etc.) in real time, to mitigate the risk of collisions and support improving sequencing and spacing and thus more effectively managing an increasingly congested airspace. Improvement of network impact assessment (NIA) functionalities towards optimiser capabilities, to provide performance-driven dynamic airspace configurations (DAC) and optimised DCB solutions. Simulation infrastructure: quantum computers could be used to train deep learning models significantly faster than classical computers, leading to breakthroughs in areas like natural language processing and image recognition. Machine learning and artificial intelligence: quantum computing could improve and accelerate machine learning algorithms by solving certain optimisation and pattern recognition tasks more efficiently. Quantum machine learning might lead to improvements in data analysis, pattern recognition, performance assessment and optimization problems. Research could also explore the interfacing of quantum programs with existing models/simulators, in order to speed up the latter.Reinforcement learning: quantum computing could be applied to accelerate the agent's learning cycle, so the reinforcement learning process converges faster to a

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stable trained agent.Climate modelling: quantum computers could resolve complex climate models with greater precision, helping to understand climate change patterns, weather forecasting, and environmental impact assessments.C-UAS detection and identification timely, quasi-immediate detection and identification of drone around sensible ground infrastructure could be handled thanks to the QC capacity. The classification of this drone (friendly, erroneous or malicious) could by identified and appropriate counter measure selected. Depending on the proposed use case(s), research shall analyse which quantum technologies / algorithms are applicable / relevant.

#### 2. Post-quantum cryptography in ATM

Quantum computing also poses challenges in ATM as quantum capabilities could potentially break traditional encryption methods. Although quantum computers capable of breaking current encryption algorithms are not yet developed to their maximum expected capabilities, the first operational quantum computers are being deployed world-wide. The EU needs to anticipate the maturing of quantum computers and start developing transition strategies towards a quantum-safe digital infrastructure now. The Commission has been funding research and development post-quantum cryptography[1] for over a decade, recognizing the potential threat quantum computing poses to present public key cryptography.

In the short-term, post-quantum cryptography (PQC) is considered to be the most promising approach to make communications and data resistant to quantum attacks. PQC allows for a swift transition to higher protection levels to secure against a cryptanalytic attack by quantum computers. In a next step, a limited scope quantum network could be used to provide perfect forward secrecy without reliance on any asymmetric algorithms (including PQC) based on Quantum Key Distribution (QKD), which could potentially be expanded to a fully-fledged quantum communication network.

The objective of the research must be to assess the cyber-security/cryptographic needs in ATM with a sense of priority, including both the ground-ground and air-ground segments, and define a short-term roadmap for introducing PQC (phase-in and hybridization) to secure the ATM infrastructure. The project must leverage previous PQC research and consider how it may apply to ATM rather than start from a clean-sheet approach. Proposals on this topic must demonstrate awareness of the European ATM communications infrastructure. The research may optionally explore how ATM may transition to QKD (e.g., as a user of the European Quantum Communication Infrastructure (EuroQCI)).

#### 3. Quantum sensing applications

The objective of the research is to explore how quantum sensing could be applied for air navigation of crewed aircraft and drones, for example to:

Provide high-performing alternative position, navigation and timing (A-PNT), addressing in particular resilient high-precision inertial navigation that is usable on all phases of flight. Recent geopolitical events have demonstrated the limitations of relying on satellite navigation. Indeed, while global navigation satellite systems (GNSS) including Galileo and the European geostationary navigation overlay service (EGNOS), are usually considered as suitable technologies for providing position, navigation, and timing (PNT) information as required, they can be subject to local (e.g., interference, spoofing, jamming) or global (ionospheric issues, system fault) outages, and it also presents service limitations in those areas where there is limited sky visibility. With the objective of having a back-up solution for GNSS as the source of PNT in the situations above, several potential technological solutions have been or are being developed to provide alternate position navigation and timing (A-PNT). While classical inertial sensors can provide the bandwidth and range, they do not provide sufficient accuracy for approach and landing. It is expected that the integration of quantum sensors into navigation systems could cover this gap, achieving high accuracy in autonomous positioning and increase resilience of trajectory based operations (quantum sensors do not refer to any external land- or satellite-based navigation infrastructure).Impact on datalink communications.Etc.

Proposals may address alternative applications of quantum sensing to ATM provided adequate background and justification is provided. [1] https://www.enisa.europa.eu/publications/post-quantum-cryptography-integration-study

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## **25. HORIZON-SESAR-2025-DES-IR-02-WA5-1 (HORIZON-JU-RIA)** Increased automation assistance for the pilot for ATM tasks

| Status      | Opening date | Deadlines     | Funding type           | Keywords |
|-------------|--------------|---------------|------------------------|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA         |          |
|             |              |               | HORIZON JO Research    |          |
|             |              |               | and Innovation Actions |          |

#### URL in Kaila:

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#### Description:

Expected Outcome:

To significantly advance the following development actions:

IR-5-01 Single pilot operations (SiPO). This includes new sensors and aircraft architectures for the evolution towards SiPO/highly automated operations.IR-5-02 Increased automation assistance for the pilot for ATM tasks. This includes improved flight-deck HMI and procedures for CPDLC, voice-less technology, etc. Scope:

The following list of R&I needs is proposed as an illustration of the potential project content, but it is not meant as prescriptive. Proposals may include other research elements beyond the proposed research elements below if they are justified by their contribution to achieve the expected outcomes of the topic and are fully aligned with the development priorities defined in the European ATM Master Plan. Single pilot operations (SiPO)

In single pilot operations (SiPO) there will only be one pilot onboard at any given time during flight, also during critical phases of flight such as take-off and landing.

Research shall address the impacts on air/ground procedures to be followed by the different actors (air traffic ATCOs, pilots, and ground operators of the airline flight operations centres) needed to manage the normal, abnormal, and emergency situations of SiPO that are related to ATM, with the needed safety and the acceptable efficiency in all phases of flight.

Research shall also address the development of the required airborne avionics for supporting SiPO that are related to ATM tasks (e.g., flight management system, surveillance function, autonomous navigation system for all phases of flight, etc.). These systems will require advanced automation and assistance in the flight deck with the objective of discharging the pilot from routine tasks in ATM, including navigation, allowing them to focus on the most critical tasks (i.e., safety of operations).

The research should aim at minimising the impacts on ATC operators, on their tools (ATC ground systems) and on the ATC-cockpit communications means.

Current error management very much relies on crosschecks between the two crew members, e.g., input of ATC altitude request to autopilot system. For a safe implementation of SiPO it will be essential to address the mitigation of the risk posed by increased errors in operations related to ATM and navigation due to missing crosschecks. Research should also consider the mitigation of the risk of a delay in the implementation of ATC instructions, e.g. due to it coinciding with a moment of high cockpit workload and/or a physiological break of the single pilot. The management from the ATM perspective of the pilot incapacitation emergency situation is also in scope.

If Al-based tools are applied, research should not only address workload and decision-making but also the adherence to procedures including crosschecks between the pilot and Al.

Research may consider mainline aircraft and/or commuter aircraft and/or business aircraft. For example, the following operational use cases may be addressed, potentially with different target maturity levels:

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Operation on the ground at complex airports.Operation on the ground at secondary airports.Low visibility operations with CAT II and/or CATIII.Operations at complex TMAs with destination/origin the main airport or a secondary airport.

Note that there is on-going work on this research element under projects SOLO, DARWIN and RESPONSE.

Artificial intelligence (AI) to enhance flight crew capabilities

Research aims at investigating how AI can support pilots in complex and critical situations, when workload may be high and/or the time to react very limited and thus improve safety. The pilot can cooperate and collaborate with the automation on board allowing efficient teaming with the automation.

For these situations, research should focus, for example, on how to exploit high levels of automation to perform non-critical ATM tasks for pilots and how the HMI should work during such operations, so the pilot can focus on essential tasks (e.g., during taxi-out, descend, approach and landing). The tasks needed to successfully execute the mission can be dynamically allocated between human pilot and automation onboard. In addition, AI-powered applications could support the pilots in situations where workload is low e.g., engaging pilot's attention and alert the pilot in case something unexpected happens. The scope includes all pilot tasks related to ATM, including navigation and taxi on the airport surface. An area of particular focus is the management of high pilot workload situations during the descent, approach, and landing; the objective is to free pilot resources to allow the use of CPDLC with push-to-load in the TMA. Research may address the development of algorithms (that are certifiable) based on reinforcement learning to help the pilot make decisions (e.g., decisions considering the impact of system failures on performance, weather, wind at alternate, range, etc.).

The research results should demonstrate how the technology could support pilots in carrying out their tasks (e.g., demonstrate an increase in human capabilities during the execution of complex scenarios or a reduction in human workload in the execution of standard tasks), and assess the impact on the role of the human. The research shall also address the methods and approaches that will lead to safe human-AI teaming that will lead to certifiability of the future applications.

These applications may play a significant role in the transition to single pilot operations; proposals in this area must demonstrate the relevance of their proposed work for ATM. Note that there is on-going work related to this research element under projects JARVIS and DARWIN.

Advanced on-board systems and procedures in support of highly automated ATM operations

Research aims at developing on-board avionics and procedures, including flight crew digital assistants for fixed-wing aircraft and helicopters, in support of highly automated ATM applications. Higher level of automation defined in the ATM master plan is enabled by teaming of human pilot with digital assistants and providing human oversight to the flight. The scope includes research elements such as: Improved on-board interface for ATM communications (voice, to reduce flight crew workload in the management of complex CPDLC clearances, and flight crew support to monitor their correct execution.Use of CPDLC in the lower levels, including tactical uplink of 2D route revision, vertical clearances, clearance for approach, clearance to land, clearance for take-off, etc.On-board systems for automatic route negotiation between aircraft systems and ATM.Development of airborne digital assistants for the flight crew in support of ATM tasks to reduce flight crew workload and ensure safety levels are maintained when operating in a more complex environment. The research may include : support for FF-ICE/R2 negotiations, support for taxi operations in large airports with complex lay-outs (including CPDLC taxi clearances and support for their on-board implementation), support for sustainable taxi operations (single engine taxi or with sustainable taxi vehicles), support for wake-energy retrieval operations, support for wake vortex encounter avoidance, support for taxi in low-visibility conditions (addressing in particular expeditious vacation of the runway), etc.Development of ATS B2 Revision B.

Proposals in this area must demonstrate the relevance of their proposed work for ATM. The development of cockpit automation that is not relevant to ATM is out of scope.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Flight-deck support for ATS B2 CPDLC v2/v4 on the airport surface.

This solution covers the development of the flight-deck (HMI, potentially including digital assistants, and avionics, including extension of push-to-load capabilities if needed), in support of the enhanced use of CPDLC on the airport surface. This includes an enhancement of the D-TAXI capabilities to allow the use of CPDLC to uplink taxi clearances when the aircraft is already taxiing, as well as for the uplink of a revised departure route at any point after the aircraft has left the gate until shortly before take-off. The new departure route could be a SID (i.e., one of the published departure routes from the airport) or a custom-made departure route (e.g., a published SID but with vertical constraints aimed at facilitating a better climb profile). This increased flexibility will make it possible to uplink departure routes shortly before take-off

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with vertical constraints to ensure separation with other aircraft so that aircraft fly more efficient vertical profiles. This applies in particular to the tactical uplink shortly before take-off of departure routes, potentially with vertical constraints. EFB applications supporting the implementation of ATS-B2 clearances and/or the downlink of ADS-C data are also in scope. Note that the load of CPDLC clearances into FMS is not expected to go through the EFB but directly through direct connection between the CPDLC box and the FMS; EFB applications may be used to support the flight crew managing the clearances received via CPDLC (e.g., performance analysis, presentation, etc.).

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 4) and the airborne prototypes (covered in WA 5).

Automation of QNH transmission between ground system and aircraft

The exchange of QNH information and the corresponding checks performed by ATS and the flight crew remain manual, increasing the workload for human operators. Moreover, the transmission of incorrect altimeter setting (QNH) between the ground system and the aircraft can lead to serious safety incidents[1]. Research aims at developing solutions for the complete automation of QNH transmission and checks between ground equipment and avionics without human intervention.

[1] https://bea.aero/en/investigation-reports/notified-events/detail/serious-incident-to-the-airbus-a320-registered-9h-emu-operated-by-airhub-on-23-05-2022-at-paris-charles-de-gaulle-ad/

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**26. HORIZON-JU-GH-EDCTP3-2025-02-FELLOW-01-two-stage (HORIZON-JU-CSA)** Global Health EDCTP3 JU and contributing partners funded Strategic Training Hubs for Fellowships in Public Health covering Biostatistics, Epidemiology and Modelling

| Status | Opening date  | Deadlines                     | Funding type                 | Keywords |
|--------|---------------|-------------------------------|------------------------------|----------|
| Open   | 30 janv. 2025 | 20 mars 2025, 2 sept.<br>2025 | HORIZON-JU-CSA<br>HORIZON JU |          |
|        |               |                               | Coordination and             |          |
|        |               |                               | Support Actions              |          |

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# **Description:**

Expected Impact: Expected Impact

The actions funded under this topic should contribute to increased international cooperation amongresearchers and funders, catalyse research synergies, and leverage resources and investments in order to achieve the establishment of an African cohort of epidemiologists, biostatisticians, mathematical modellers by supporting institutions in sub-Saharan Africa and Europe that provide Master's training in epidemiology and biostatistics or those that process public health data with advanced quantitative methods to inform policy, as part of the Africa CDC's framework for public health workforce development. Proposals are expected to include the effective in-kind and/or financial contribution of contributing partners, in order toproduce meaningful and significant effects enhancing the impact of the related research activities.

### Applicant consortium

The contributions from contributing partners should correspond to the amounts they have committed in the letter of endorsement requesting to become a contributing partner (Article 9 Council Regulation (EU) 2021/2085). Their contributions can consist of financial contributions and/or in-kind contributions. Applicant contributing partners must submit the endorsement letter for approval by the Global Health EDCTP3 Governing Board before the deadline for submission of the second-stage applications. It is recommended that the draft letter is submitted to the Global Health EDCTP3 Programme Office sufficiently ahead of deadline for submission of proposals to allow the review[1].

In case of in-kind contribution (even combined with financial contribution), contributing partners become a part of the applicant consortium and participate in the project, as appropriate i.e. as beneficiaries or Affiliated entities in the meaning of Article 8 of the Horizon Europe model grant agreement.

[1] The Global Health Programme Office will ask the applicant contributing partner to revise the letter in case it significantly departs from the template letter published on the Global Health EDCTP3 JU website or is missing any compulsory elements. The preliminary assessment by the Programme Office does not consider the merits of the application. The final decision as to acceptance or rejection of a new contributing partner rests with the Global Health EDCTP3 JU Governing Board Expected Outcome:
Background

Capacity building and strengthening of the research environment is at the core of Global Health EDCTP3 objectives and in line with the implementation of the EU Global Health Strategy's Guiding Principles 6 and 7 to "address workforce imbalances and foster skills" and 7 févr. 2025 | Open and forthcoming funding opportunities for artificial intelligence area

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"strengthen capacities for prevention, preparedness and response and early detection of health threats globally".

The Africa CDC Framework for Public Health Workforce Development 2020-2025 aims to strengthen the capacity of 1) field epidemiologists, 2) laboratory leadership and medical laboratory training, 3) public health informatics, as well as 4) specific knowledge and skills such as surveillance, AMR monitoring and management, laboratory quality assurance as well as surveillance and response. The 2023-2027 Africa CDC Strategic Plan stresses the acute shortage of critical public health workforce with only 1 900 field epidemiologists out of the 6 000 required and only 5 000 of the needed 25 000 frontline epidemiologists.

Following a pilot collaboration with Africa CDC for a joint fellowship call under EDCTP2, the Global Health EDCTP3 is proposing to renew the joint call for fellowships [1]. After taking stock of the lessons learnt from the first programme, a funders partnership will support a joint call, i) to increase the number of fellows trained and ii) to expand the breadth of skills offered and diversity hosting institutions involved. This renewed joint call will include epidemiology and biostatistics and infectious disease modelling.

### Expected Outcome

Proposals submitted under this topic should aim for delivering results that contribute to at least three of the following expected outcomes: Increase the number of public experts: skilled epidemiologists, biostatisticians, and infectious diseases modellers in SSA;Promote the career development and retention of skilled personnel in SSA;Strengthen SSA countries clinical human capital base in R&I;Enhance talent retention, knowledge circulation and uptake across the research and innovation landscape in SSA;Establish sustainable and mutually beneficial collaboration between national public health institutes, clinical research organisations and academia across SSA and Europe. [1] Cooperation is based on the "Working Arrangement between the Africa CDC and the European Commission" signed in March 2024 and is foreseen to be further developed within a framework collaboration agreement between the Global Health EDCTP3JU and Africa CDC (currently under preparation).

Scope:

Scope

The objective of this topic is to establish an African cohort of epidemiologists, biostatisticians, mathematical modellers by supporting institutions in SSA and Europe that provide Master's training in epidemiology and biostatistics or those that process public health data with advanced quantitative methods to inform policy, as part of the Africa CDC's framework for public health workforce development.

The Master's degree courses with practical field research experience must be robust and of the level of training for the epidemiology and biostatistics that is delivered within reasonable time for the required numbers and high-quality fit-for purpose personnel urgently needed in zones of outbreak/epidemic risks in SSA. Early- to mid-career researchers or data scientists (or similar) are the targeted level of training for the infectious disease modelling.

### Proposals must demonstrate all of the following:

A high-quality training programme as 1/ Master's training in Epidemiology and/or Biostatistics (broader Master's in public health majoring in epidemiology or biostatistics are also applicable);or 2/ specific training courses/seminars/workshops infectious disease mathematical modelling; The Master's programme must include a research and development component aligned with the scope of the Global Health EDCTP3 JU and must be conducted in a country in SSA;An open, fair and transparent procedure for selecting the fellows coming from different geographical regions of SSA, based on quality and with appropriate gender balance;Robust mentorship and supervision mechanisms to support fellows through to timely successful course completion;The applicant must be an organisation with an established legal entity in SSA (the applicant legal entity);Proposals must be submitted by a consortium of institutions which must provide above mentioned trainings for up to 50 early- to mid-career researchers per consortium;Proposals should provide details on the methodology for linking clinical research aspects with the translation into healthcare practice and policy;The requested Global Health EDCTP3 JU contribution per action shall not exceed EUR 1,25 million.

The fellow must:

Be resident of or be willing to relocate to a sub-Saharan African country, member of the EDCTP Association;Not have been funded under a similar previous EDCTP or Global Health EDCTP3 fellowship scheme before. In addition:

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#### 1/ For the Master's degree training:

Proposals should include institutions with a proven track record in the provision of high-quality Master's training with clear local and regional collaborations with National Public Health Institutes- NPHIs (or similar agencies), Ministries of Health and other academic institutions; The maximum fellowship duration shall be 24 months; Fellows for the Master training must be employed or have guaranteed employment by the applicant legal entity (the host organisation) where they intend to remain working for a minimum of two years after the expiration of the grant, therefore, applying trainees must provide evidence to demonstrate this through a letter of support from their home institution. 2/ For proposals with modelling training:

Contributing partners, via the Global Health EDCTP3, will provide funding on modelling training, meeting the need for modellers to strengthen NPHIs core functions. The funding will support comprehensive short term training programmes, workshops and/or seminars to interested specialists to empower Africa-based researchers with relevant skills to conduct infectious disease modelling and enhance capacity to respond effectively to outbreaks and pandemics. Supported institutions will offer:

Modelling training focusing on infectious diseases modelling; Workshops or seminars considering different skill levels of trainees to cover key aspects of infectious disease modelling, including but not limited to: i. Mathematical and statistical modelling techniques; ii. Scenario planning and model forecasting; iii. Integration of modelling output into public health policy and response strategies. Provide mentorship and support to facilitate the application of acquired skills in real world settings for key LMIC implementors.

Proposals submitted against this topic are expected to leverage financial and/or in-kind contribution from contributing partners. Proposals should define the activities of their project in its entirety, including details of the component(s) for which Global Health EDCTP3 JU funding is requested and the component(s) that are to be financed by contributing partners introduced by the applicant consortium.

In addition to these contributions leveraged by the applicants, Global Health EDCTP3 JU may involve other contributing partners that have expressed interest in supporting this topic with cash or in-kind contribution.

Proposals should describe how participating organisations are expected or plan to have access to large databases that will enable future fellows to work on and with robust data. Proposals are encouraged to include the use of Artificial Intelligence in the training when relevant.

FAIR data principles and open access of publications are required in line with the Model Grant Agreement [1].

Proposals should include consortia with strong representation from institutions and researchers across sub-Saharan African countries, demonstrating a broad regional distribution in the SSA region, including involvement of new institutions and Franco/Lusophone countries, and considering previous EDCTP 1 and 2 investments and current EDCTP3 call. Applicants are also reminded of the expectation of reaching out to organisations in countries with high burden of disease with relatively lower research capacities, for which appropriate funding allocations should be proposed. Collaboration with other international research groups with relevant experience and participation in networking and joint activities, as relevant, is strongly encouraged.

[1] general-mga\_horizon-euratom\_en.pdf (europa.eu)

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# 27. HORIZON-SESAR-2025-DES-IR-02-WA6-3 (HORIZON-JU-IA)

Fast-track Enabling innovative air mobility (IAM) / Vertical take-off and landing capable aircraft (VCA) (crewed and uncrewed) operations

| Status      | Opening date | Deadlines     | Funding type          | Keywords |
|-------------|--------------|---------------|-----------------------|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-IA         |          |
|             |              |               | HORIZON JU Innovation |          |
|             |              |               | Actions               |          |

# URL in Kaila:

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# **Description:**

Expected Outcome:

To significantly advance the following development actions:

IR-6-04 Enabling IAM/VTOL capable aircraft (crewed and uncrewed) operations, including in complex environments, congested areas and vertiports. This includes IAM operational procedures enabling access to all types of airspace and vertiports (both VMC and IMC) and IAM automation including simplified vehicle operations, automatic take-off and landing (TOL), resilient navigation, energy management, etc. Research shall take into consideration the work done under EASA[1] on this element, especially in relation to General Aviation i-conspicuity needs.

Scope:

The following list of R&I needs is proposed as an illustration of the potential project content, but it is not meant as prescriptive. Proposals may include other research elements beyond the proposed research elements below if they are justified by their contribution to achieve the expected outcomes of the topic and are fully aligned with the development priorities defined in the European ATM Master Plan. Vertiport management for crewed VCA

EC IR 2014/1111[2] established the requirements for operations of crewed VCA, with specific requirements for the specification in the operational flight plan of at least two safe landing options at the destination, as well as adequate vertiports, diversion locations for VTOL aircraft (carrying out flights for medical missions in urban areas) (VEMs) operating sites that are available and permit a landing to be executed in a critical failure for performance (CFP). The research must establish how to fulfil this requirement from the ATS perspective, addressing:

If the landing sites should be introduced in the ATS flight plan (the regulation currently leaves this point open) and if so, how this would be done for both VFR aircraft and IFR aircraft. Note for IFR crewed VCA, the landing sites should be included in the FF-ICE flight plan and coordination is needed with the WA1 or WA3 projects working in this area). Design and validate process to book all landing sites from departure to destination and progressively release contingency sites as the flight progresses and investigate how this process will be integrated with ATM processes. Research should investigate if for VFR aircraft the booking of the landing sites should be linked to a new VFR flight plan acceptance process, to an ATC clearance to land at the destination and all the landing sites given at the time of take-off, to a FIS-like service declaring all sites are available is sufficient to cover the requirement, or a different U-space service needs to be defined. The legal liability in case the landing site is not available when the VCA arrives must be investigated.

The research must address the following cases:

The destination is in a controlled airport that is not in U-space airspace. In this case, the research could develop an ATC reasonable assurance principle to allow the use of one or both landing spots planned in a VTOL capable aircraft (VCA) flight plan even after the VCA is already enroute. The adaptation of the conflicting ATC clearances safety net to support the concept could be investigated. The destination vertiport is in U-space airspace that is in controlled airspace. Note in this case the DAR principle in U-space regulation[3] applies, so that the airspace will be clear of drones and managed as controlled airspace during the conduct of the crewed VCA flight. The research may propose alternative airspace sharing concepts beyond what is possible within the current regulation.

The research must aim at delivering a TRL6 solution aimed at enabling the deployment of crewed VFR VCA and Progress towards a future solution applicable to crewed IFR VCA, for which an FF-ICE flight plan acceptance process must be defined and validated (for this point, 7 févr. 2025 | Open and forthcoming funding opportunities for artificial intelligence area

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coordination with relevant projects in WA1 and WA3 is required).

This element covers vertiport management for vertiports located in controlled airspace (class A-D) – which could also be in U-space airspace - and vertiports located in uncontrolled airspace (class F and G) that is not also declared as U-space airspace. Vertiports located in uncontrolled airspace that is also U-space airspace are covered in the element below (in this same WA).

Note that there is on-going work under project EUREKA.

Advanced vertiport and VCA U-space services

This element covers vertiport management functions and activities that impact traffic management for vertiports located in U-space airspace, bearing in mind the constraints imposed by battery powered aircraft. This may include:

Processes that determine or limit take off time.Processes that determine or limit landing time.Processes governing occupancy of critical resources such as the touchdown and lift-off area (TLOF).

These processes should be identified, and consideration given to their optimisation in the context of U-space including collaborative decision making and coordination as appropriate. Note that there is on-going work under project EUREKA.

This topic covers vertiport management for vertiports in uncontrolled airspace (airspace F and G) that is also declared to be U-space airspace (expected to have significant traffic of small drones); the focus of the research is to ensure separation between small drones and VCA vertiport users. Vertiports that are not located under U-space airspace or that are located in U-space airspace in controlled airspace are covered by the element above (in this same WA).

Initially, the scope is focused on crewed VCA operations, but it is expected that the same concepts will be applicable for uncrewed VCA. Crewed IFR VCA

The aim of the research is to develop the concept for IFR crewed VCA, building on existing SESAR solutions for IFR helicopters "Optimised low-level IFR routes for rotorcraft" (SESAR solution #113) and "Independent rotorcraft operations at airports" (SESAR solution PJ.02-05). The solution should assess the applicability of existing IFR rotorcraft procedures and flight planning processes to VCA, adapting them where necessary.

In particular, the research must assess how VCA energy management constraints may affect the capability of VCA aircraft to follow the type of IFR clearances in use for helicopters and develop and validate their use for VCA, proposing and validating new clearances where needed.

Note the flight planning aspects related to the introduction of the landing sites in the FF-ICE flight plan should are linked to vertiport management and hence in scope of the previous bullet point "Vertiport management for crewed VCA".

Automation of the VCA cockpit and remote pilot's working position

The objective of this element is to address pilot digital assistance and automation support for the VCA cockpit to support a simplified VCA workload (e.g., aimed at a reduction of VCA crew workload related to pilot's tasks and tasks related to communication with ATM, implementation of tactical ATC clearances, and on-board implementation of strategic changes to the flight plan in the execution phase for IFR VCA (after an FF-ICE/R2 revision process). The scope includes in particular the development of cockpit automation to support a concept for digital ATM communications via CPDLC during all phases of flight (en-route, TMA and airport).

The ultimate objective is to make it possible that the flight crew workload is reduced to support the concept of one remote pilot overseeing from its working position two or more VCAs.

Note that there is on-going work on this research element under project OPERA.

Automatic take-off and landing (ATOL) for crewed or uncrewed VCA and helicopters

The scope includes the development of navigation and procedures to enable all -weather take-off and landing for crewed or uncrewed VCA. Resilience of the navigation solution must be addressed. The solution is expected to progress from an initial flight-director-based concept towards the end goal of autopilot-based ATOL. Charts, procedure design and avionics should be addressed. Note that similarly to what happens today with Autoland for fixed-wing aircraft today, air traffic aspects e.g. clearance for approach, take-off and landing are not different in ATOL from vs. manual TOL (just like whether Autoland is used does not change the way ATM currently manages a flight), and hence do not need to be covered by this solution.

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Note that there is on-going work on this research element under project OPERA.

ATC and flight information service (FIS) automation support

VCA will first be certified as VFR, to later progress to IFR. The objective of the research is to increase the level of automation of VFR aircraft by ATC and FIS. Flight data processing systems (FDPSs) are designed for supporting ATC in the management of IFR aircraft, and typically do not provide adequate functionality to support ATC for the management of VFR aircraft. This results in VFR flights often causing unexpected ATS workload in the lower airspace. Research shall develop ATS automation tools and procedures to provide ATC or FIS services to VFR aircraft in airspace C-G and FIS services to IFR aircraft in uncontrolled airspace (airspace F and G). Research shall aim, as much as possible, at developing tools and concepts that can be applicable to both ATC (TWR or En-Route/TMA) and AFIS. The tools and procedures to be applicable will be applicable for all equipped VFR aircraft (not just VCA):

Development of a new FF-ICE-like flight plan standard for VFR aircraft.Improve ATC ground systems for handling VFR flights and for supporting the transition IFR to VFR and VFR to IFR.One of the difficulties for the management of VFR aircraft is that they are not subject to the same ATC clearance requirements, and they do not have to adhere to their flight plan like IFR aircraft. The research may investigate how to reduce the uncertainty on VFR flights (e.g., by using new methods based on artificial intelligence/machine learning to better forecast VFR traffic). The research may investigate methods allowing VFR aircraft to share their intended route with ATC (e.g., via the downlink of the planned trajectory from an EFB using the applicable air/ground SWIM standard). Automation support for the provision of traffic information, potentially including fully automated provision of routine traffic (for VCA), on approach and departure, beyond the initial requirement from EASA Prototype Specification, and in particular the ability to sustain possible encounter with wake vortices, generated by other aircraft or (large) rotorcraft. VCA (as multi-rotor vehicles) might have the same controllability / control authority (crewed or uncrewed) as other rotorcraft or as fixed wing aircraft, and this should be further studied and understood, based on state-of-the-art wake turbulence characterisation capabilities and risk assessment methodologies, in order to assess the need for applicability of standard or specific wake turbulence separation or management requirements.

This research will pave the way for the introduction of digital flight rules, which is currently in scope of exploratory research.

https://www.easa.europa.eu/en/research-projects/i-conspicuity-interoperability-electronic-conspicuity-systems-general-aviation
 https://eur-lex.europa.eu/eli/reg\_impl/2024/1111/oj

[3] European Commission Implementing Rules EU IR 2021/664 and EU IR/665.

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# **28. SUSRUR Open Call 3 - COLLABORATE ()** SUSRUR Open Call 3 - COLLABORATE

| Status            | Opening date | Deadlines     | Funding type | Keywords |
|-------------------|--------------|---------------|--------------|----------|
| Open              | 15 nov. 2024 | 12 févr. 2025 |              |          |
| URL in Kaila:     |              |               |              |          |
| <u>Click here</u> |              |               |              |          |

# **Description:**

Submission & evaluation process:

1. Submission Process:

Apply online via F6S Submission System: https://www.f6s.com/susrur-open-call3/apply

IMPORTANT: Documents to be submitted during the Sub-grant Agreement stage if your application is selected:

Declaration of HonourSME Status ChecklistOther documents that can assist the Open Call Manager during the eligibility process

The documentation kit of this call, which contains all its documents, is available at https://susrur.eu/open-call-3/open-call-3-collaborate

Personal data privacy will be managed according to article 4.5 Data protection of the Call for Proposals and Guide of Applicants https://drive.google.com/file/d/1PrcJsOTROHvm7fjWt\_Az2fvflac7v73x/view

Any further questions regarding the application process should be addressed at contact@susrur.eu

2. Evaluation Process:

Applications will be reviewed by the SUSRUR Review Panel composed of five members from consortium partners, with proven expertise in

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the field. Applications will be sorted and selected through the following three main phases:

Admissibility and Eligibility checkRemote evaluationRanking and final selection.

Applicants must:

outline the alignment of their business with the remote and rural tourismshowcase a strategic alignment of consulting topics and its impact to the business digital and green transitionThe evaluation process will be conducted remotely. At the end of the evaluation process, applications will be ranked considering the final score. Evaluation criteria is described in article 5 of the Guide for Applicant https://drive.google.com/file/d/1PrcJs0TROHvm7fjWt\_Az2fvflac7v73x/view.

Applicants will be informed of the decision related to their applications within two weeks upon deadline via dedicated email.

The final list of funded third parties will also be published on SUSRUR website.

Further information:

Up to 50 SMEs from eligible regions will be supported by SUSRUR Open Call 3 - COLLABORATE.

SUSRUR project (GA nº101085887) was launched in January 2023 to address the inherent challenges for Tourism SMEs from 5 European rural and remote areas by promoting an open call to help awarded applicants to develop their sustainability and innovative practices and strategies while providing tools and skills to strengthen their competitiveness in a post-COVID-19 scenario.

SUSRUR main goal is to provide a networking and support platform to tourism SMEs in rural and remote/mountain areas to enhance the awarded applicants sustainability practices, productivity, competitiveness and innovation capacity, promoting innovative technologies, services and business models and boosting their capacity and skills to embrace the twin digital-green transition.

What do we offer?

In the nutshell, advantages of participating in SUSRUR Open Call #3 are as follows:

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Participate in a 6-month programme to improve your sustainability performance towards green and digital transition through the access to specialised servicesObtain credibility and recognition from an EU projectReceive up to EUR 6 000.00 lump sum funding (equity free)Develop new skills, and replicate and implement innovative solutionsNetworking opportunities within your region and other eligible regions

**Financial Support** 

Total funding per applicant is up to EUR 6 000.00 (lump sum).

Payments will be made in two installments upon completion of defined checkpoints (article 2.3 Payment schedule of the Guide for Applicants https://drive.google.com/file/d/1PrcJsOTROHvm7fjWt\_Az2fvflac7v73x/view). Payment release will depend on the completion of each checkpoint upon approval by the Open Call Manager.

Payment will be proceeded as follows:

EUR 1 500.00 upon signature of the Sub-Grant AgreementEUR 4 500.00 upon completion of checkpoint 1

Applicants must guarantee that the Financial Support to Third Parties is used to complete the supporting activities.

Task description:

During the implementation of the Collaborate Programme, applicants are expected to implement and be enrolled in the below activities:

A) Access to specialised consulting services

Through the access to specialised consulting services, applicants will have at their disposal a range of specialised services from business analysis or/and guidance to develop key competences in digital tools, marketing, sustainability, resilience and economics. Available services in the Collaborate Programme will focus on the topics listed below:

Digital Marketing Plan: a business strategy that outlines how the SME will use digital platforms & channels to promote its products and services to different target audiences. It must include goals & amp; objectives, target audiences, value proposition and metrics (Key Performance Indicators, KPIs). Sustainability Action Plan: a plan that sets clear, measurable and realistic short and long-term objectives to improve the SMEs sustainability aspects in connection with the Sustainable Development Goals (SDGs). It must include goals & amp; objectives, strategies & amp; actions and indicators (KPIs). Technology and Innovation Survey for the Circular Economy of rural tourism SMEs: a report that critically examines the different technologies and innovations available for the circular economy of rural tourism SMEs and its possible applications, including the topics of water management & amp; reduction, waste & amp; resource management, renovation, sustainable production & amp; consumption, packaging materials, locally supplied goods & amp; services,

etc. Technology and Innovation survey for the Clean Energy Transition of rural tourism SMEs: a report that critically examines the different technologies and innovations available for the clean energy transition of rural tourism SMEs and its possible

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applications, including the topics of decarbonisation, renewable energy technologies, energy efficiency, among others. Technology and Innovation survey for the Digitalisation of rural tourism SMEs (\*Digital Plan excluded): a report that critically examines the different technologies and innovations available for the digitalisation of rural tourism SMEs and its possible applications, including the topics of interactive and data-driven services, immersive technologies (Augmented (AR) & amp; virtual reality (VR)), Artificial Intelligence (AI), accessibility of tourism services, among others. & nbsp;

Expected duration of participation:

6 months

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# 29. ERASMUS-EDU-2025-PEX-COVE (ERASMUS-LS)

# Centres of Vocational Excellence

| Status        | Opening date | Deadlines    | Funding type                             | Keywords |
|---------------|--------------|--------------|--|----------|
| Open          | 5 déc. 2024  | 11 juin 2025 | ERASMUS-LS<br>ERASMUS Lump Sum<br>Grants |          |
| URL in Kaila: |              |              |  |          |

### <u>Click here</u>

# Description:

### Scope: CENTRES OF VOCATIONAL EXCELLENCE

Implementing vocational excellence approaches features prominently in the overall EU policy agenda for skills and for Vocational Education and Training (VET). The European Skills Agenda, the European Education Area, the 2020 Council Recommendation on VET [https://eurlex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020H1202%2801%29 ], as well as the Osnabrück Declaration [https://www.cedefop.europa.eu/files/osnabrueck\_declaration\_eu2020.pdf ], all include very clear references to Vocational Excellence as a driving force for reforms in the VET sector.

The initiative on Centres of Vocational Excellence (CoVE) aims to respond to this policy priority supporting reforms in the VET sector, ensuring high quality skills and competences that lead to quality employment and career-long opportunities, meeting the needs of an innovative, inclusive and sustainable economy(See brochure on VET skills for today and for the future). The CoVE initiative also supports the implementation of the European Green Deal, the Communication on attracting Skills and Talent and the new Industrial and SME Strategies, as skills are key to their success, as well as the Communication on skills and talent mobility adopted in 2023247, the Action Plan on labour and skills shortages, and the Council Recommendation 'Europe on the Move'.

CoVEs operate in a given local context, creating skills ecosystems for innovation, regional development and social inclusion while working with CoVEs in other countries through international collaborative networks. They establish a bottom-up approach to vocational excellence involving a wide range of local stakeholders enabling VET institutions to rapidly adapt skills provision to evolving economic and social needs.

They provide opportunities for initial training of young people as well as the continuing up-skilling and re-skilling of adults through flexible and timely offer of training that meets the needs of a dynamic labour market, including in the context of the green and digital transitions. They act as catalysts for local business development and innovation, by working closely with companies (in particular SMEs) on applied research projects, creating knowledge and innovation hubs, as well as supporting entrepreneurial initiatives of their learners.

The networks aim for "upward convergence" of VET excellence. They will be open for the involvement of countries with well-developed vocational excellence systems, as well as those in the process of developing similar approaches, aimed at exploring the full potential of VET institutions to play a proactive role in support of growth and innovation.

This initiative introduces a European dimension to vocational excellence by supporting the implementation of EU VET policy and actions agreed with member states, social partners and VET providers.

The concept of vocational excellence proposed here is characterised by a holistic, learner-centred approach in which VET:

• Is an integrated part of skills ecosystems [Skill ecosystems are defined as regional or sectoral social formations in which human capability is

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developed and deployed for productive purposes (Finegold 1999). Their basic elements are business settings and associated business models, institutional/policy frameworks, modes of engaging labour, the structure of jobs, as well as the level of skills and systems for their formation (Buchanan et al. 2001). See A guide to the skill ecosystem approach to workforce development ], contributing to regional development [Regional Development Policy - Regional development is a broad term but can be seen as a general effort to reduce regional disparities by supporting (employment and wealth-generating) economic activities in regions], innovation [An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations], smart specialisation [Smart Specialisation is a place-based approach characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process with wide stakeholder involvement. It is outward-looking and embraces a broad view of innovation including] and clusters strategies [Industrial clusters are groups of specialised enterprises, often SMEs, and other related supporting actors in a location that cooperate closely. There are around 3000 specialised clusters in Europe. The renewed EU industrial policy recognises clusters as a powerful tool to support industrial innovation. See European Cluster Collaboration Platform (ECCP).], as well as to specific value chains and industrial ecosystems;

• Is part of knowledge triangles [See Education in the knowledge triangle ], working closely with other education and training sectors, the scientific community, and business;

• Enables learners to acquire both vocational (job specific) as well as key competences [As defined in the Council Recommendation of 22 May 2018 on key competences for lifelong learning] through high-quality provision that is underpinned by quality assurance;

• Builds innovative forms of partnerships [See ETF work on Public-Private Partnerships for inclusive skills development] with the world of work, and is supported by the continuous professional development of teaching and training staff, innovative pedagogies, learner and staff mobility and VET internationalisation strategies.

### OBJECTIVES OF THE ACTION

This action supports the gradual establishment and development of international collaborative networks of Centres of Vocational Excellence.

The Centres of Vocational Excellence aim at achieving the following objectives:

• to ensure high quality skills through flexible and learner-centred VET provisions that lead to quality employment and career-long opportunities, swiftly responding to the needs of an innovative, inclusive and sustainable economy as well as to societal needs;

• to support and act as drivers for local and regional development, innovation and social inclusion in the context of the green and digital transitions;

• to contribute to upward convergence on VET excellence, to increase the quality of VET at system level in more and more countries;

• to ensure that outputs and results are taken into use and have impact beyond the project partner organisations and beyond the project period. Centres of Vocational Excellence operate at two levels:

1. At national level, involving a wide range of local stakeholders creating skills ecosystems for local innovation, regional development, and social inclusion, while working with CoVEs in other countries through international collaborative networks.

2. At international level, bringing together CoVEs that share a common interest in:

• specific sectors [See for example the agricultural European Innovation Partnership (EIP-AGRI) works to foster competitive and sustainable farming and forestry] or industrial ecosystems [See 14 industrial ecosystems as described in Commission Communication on Updating the 2020 New Industrial Strategy, as well as the SWD(2021) 351, Annual Single Market Report 2021];

• innovative approaches to tackle economic and societal challenges (e.g. climate change, digitalisation, artificial intelligence, sustainable

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development goals [See Berlin Declaration on Education for SDG ], integration of migrants and disadvantaged groups, upskilling people with low qualification levels, etc.), or

• innovative approaches to increase the outreach, quality and effectiveness of existing CoVEs.

The networks will bring together existing CoVEs, or develop the Vocational Excellence model by linking partners from various countries, that intend to develop Vocational Excellence in their local context through international cooperation. They could contribute e.g. to the delivery phase of the New European Bauhaus initiative by collaborating with the communities involved in the local transformations fostered by the initiative.

CoVEs achieve their objectives by bringing together and working closely with a set of local/regional partners such initial and continuing VET providers, higher education institutions including universities of applied sciences and polytechnics, research institutions, science parks, innovation agencies, companies, other employers, chambers and their associations, social partners, social enterprises, sectoral skills councils, professional/sector associations, national and regional authorities and development agencies, employment services, qualifications authorities, social inclusion and reintegration organisations, etc.

This call will thus support projects bringing together local or regional partners from various countries developing a set of activities under three clusters; 1) Teaching and learning, 2) Cooperation and partnerships, and 3) Governance and Funding.

CoVEs are required to apply EU wide instruments and tools [Such as the EQF, EQAVET, Council Recommendation on a European Framework for Quality and Effective Apprenticeships, Council Recommendation on key competences, etc.] whenever relevant.

They must include the design of a long-term action plan for the progressive roll-out of project deliverables after the project has finished. This plan shall be based on sustained partnerships between education and training providers and key labour market actors at the appropriate level. It should include the identification of appropriate governance structures, as well as plans for scalability and financial sustainability.

While the Erasmus+ CoVE initiative promotes a European dimension to VET Excellence, the EU policy on VET Excellence also has an international dimension, supported by the European Training Foundation (ETF). ETF has developed a self assessment tool (ISATCOVE), a concept for a label for excellence, and is providing support services to organisations interested in vocational excellence. To see the list of CoVEs already funded, please check EU Funding & amp; Tenders Portal. Factsheets for the funded projects are also available on the website of DG Employment, Social Affairs and inclusion:

Projects funded under the 2020 call for proposals

Projects funded under the 2021 call for proposals

Projects funded under the 2022 call for proposals

For more information, see the Erasmus+ Programme Guide 2025

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# **30. Women TechEU Open Call #3 ()** Women TechEU Open Call #3

| Status | Opening date  | Deadlines    | Funding type | Keywords |
|--------|---------------|--------------|--------------|----------|
| Open   | 15 janv. 2025 | 17 mars 2025 |              |          |

# URL in Kaila:

<u>Click here</u>

# Description:

Submission & evaluation process:

The submission will happen through the official online submission platform, which is directly linked to the WomenTechEU website. Only applications received directly through the online submission platform will be considered eligible.

The submission process is supported by the following documents:

Guideline for applicants: all the information you need to know before applying.

Online Form: completed via Sploro platform and divided into six sections (1) Legal and Contact Information of the applicants (2) Impact section (3) Excellence section (4) Implementation (5) Ethics self-assessment (6) Declaration of Honour.

The evaluation process consists of three phases:

Eligibility check: A semi-automatic filter will consider 10 criteria that all applicants must comply with to be eligible. The eligible proposals will then be assessed using a points system that emphasizes desirable criteria. Points will be awarded based on specific and measurable criteria, with only the highest-scoring applications proceeding to experts' remote evaluation. Experts' remote evaluation: The proposals that pass the eligibility check and get a high-score will move to the remote evaluation stage. Applications will be assessed by a group of external and independent evaluators with an entrepreneurial, investment or innovation background. Two evaluators, one with technical and another one with commercial business background, will assess the proposals based on 3 different evaluation criteria (Impact, Excellence, and Implementation). Score normalisation: This method ensures a more balanced distribution of scores and reduces the possibility of biases and distortions. At the event that a divergence greater of 20% persists, the two evaluators will hold a consensus meeting.

Final Selection: All proposals are ranked based on their remote evaluation scores. In the event of a tie, a series of rules will be followed that will make it possible to reach a tiebreaker.

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For any question about the process there is a general email address available at helpdesk@womentecheurope.eu

Further information:

The Women TechEU project is on a mission to ignite the potential of women-led early-stage startups in deep-tech! 160 talented women entrepreneurs from all over the European Union and Horizon Europe associated countries will be receiving direct support. With 75k€ funding (non-diluting finance) and a personalized business development programme, the project will be paving the way for these innovators to shine as leaders in deep tech innovation across Europe.

During 2 years, the project will give out a total of 12 M€ in non-diluting finance over 4 different competitive calls. Each cohort of successful entrepreneurs will then also be invited to use the menu of business development services that will be provided over a period of 6 months.

To be eligible as an applicant at Women TechEU, it is essential to understand certain key criteria that define the profile of a qualified beneficiary. Here are the key definitions that guide the selection of beneficiaries:

1. Established country: the applicant must be established in a EU Member State or Horizon Europe Associated Country\*.

\*List of Horizon Europe Associated Countries as published by the European Commission on the date of the opening of the call.

2. Early-stage startup:

•The legal entity should be established at least six months prior to the opening of the call.

•The 'startup' should be compliant with the definition of SME, according to the EU definition of SMEs according to the EU recommendation 2003/361.

• Early-stage refers to the phase of startup development generally preceding the rapid growth phase. As an indication, the following criteria will be considered, amongst other to define an early-stage startup:

Startups that have been established and operating for not more than 8 years counting backwards from opening of the call date and, Startups that have raised limited funding (up to  $1 \text{ M} \in \text{in equity}$ ), Before reaching a high fidelity Minimum Viable Product.

3. Women leadership: Women legally recognized as founders or co-founders of the company. The founder or co-founder of the company must also currently hold a top management position (CEO, CTO or equivalent) within the same company. It will be also required that women hold at least 25% of the shares in the CAP table (capitalization table) of the company.

Important Notes:

Women TechEU supports women in all their diversity. The word "woman" equates to a cis woman, or a transgender woman who is legally defined as a woman.

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The lead applicant of the submission must be a woman.

The means of verification will be the Identity Card issued by the country of their nationality.

4.Deep tech: "Deep tech innovation aims to provide concrete solutions to our societal problems by finding its source in a deep interaction with the most recent scientific and technological advances and by seeking to produce a profound impact in the targeted application areas."

Sectors, which are most fertile for deep tech applications are life-science, computing, food and agri-tech, aerospace, energy and clean-tech, industrial technologies, telecom, new materials, or chemistry. However deep tech also includes, among other, artificial intelligence, deep learning and machine learning.

Women TechEU welcomes applications from all deep tech fields of activity.

5. Not previously funded for the same activities by another EU Programme: To avoid double funding, neither the full application of any of its parts have benefited from any other EU Programme such as Women TechEU initiative, EIC Accelerator or similar initiatives (i.e.: Horizon Europe - EmpoWomen).

6. Not part of Women TechEU beneficiaries: Women TechEU consortium partners, their affiliated entities, employees, and subcontractors are not allowed to submit a proposal and therefore to receive any financial support through the open calls.

Financial Support

This third call boasts a total budget of €3,000,000. Beyond the equity-free funding of €75,000 per startup, Women TechEU extends support through a Programme of service (see section below).

Programme of service

This unique Women TechEU Service offers a 6-month package where the beneficiaries can select from:

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Service 1 Female mentors (one meeting per month during 5 months): As part of the programme, we will offer women entrepreneurs access to carefully selected, and experienced women mentors who will provide guidance, support, and valuable insights tailored to each founder and designed to help them succeed in their business ventures. Through the Sploro platform, we will enable specific matchmaking of and connections and mentorship sessions between women, fostering a supportive network that can help overcome the unique challenges women entrepreneurs often face. Research has shown that positive influence from successful women can play a crucial role in the success of other women-led businesses.

Service 2 Investor outreach and pitch preparation: We will open doors and make introductions to investor entities (business angels, VCs, funds) in our networks who are positively welcoming women entrepreneurs. Our experts will provide pitch presentation review and rehearsal support providing guidance and feedback to improve confidence in delivery. This will help the startups overcome the challenge of raising early investment that women founders often face.

Service 3 Investor and Export Readiness Check: Using a structured approach with questions on the core business areas, the startups will be assessed on team, product, market, finance, operations and IP in order to determine if they are ready to pitch in front of investors, or present to potential clients. Women entrepreneurs tend to doubt themselves a million times more than male counterparts so practising with one of our experts will build confidence, and if there are areas that need attention, they will be helped to address those before pitching. Connections with EIT Food programme in internationalization RocketUp will be sought, when possible.

Service 4 - Soft Skills Training: Since the Women TechEU startups are at the beginning of their entrepreneurial journey, the women entrepreneurs will be offered development content on soft skills areas like public speaking, presentation, leadership skills, improve productivity by using AI, and more. Given that they come from the deep tech sector, their hard skills will be top-notch, but we want to train them to become an all-rounder with our blended courses (mix of in-person and recorded sessions).

Service 5 - Sales Strategy & amp; Execution: The go-to-market strategy is the area where most companies fail. We see this in front of investors as well as in the pitches to the juries at the EIC Accelerator sessions. Here at Women TechEU we expect the companies to be even more embryonic in their understanding of how to find leads, how to fill their pipeline, when and what to say upon follow up and even how to tune the pricing models to the right target group of clients. Women entrepreneurs tend to be less aggressive in their sales strategy and we want to instil in them the knowledge and confidence that it is ok to ask for money for services and products.

Service 6 - Environmental Impact Assessment: The environmental impact of technology and business models from entrepreneurs is a growing area of interest to investors. Women TechEU will offer the service of climate impact projections to support women entrepreneurs to understand the environmental impact of their innovations and help them design sustainable and impactful business models from the outset. The service leverages an online tool designed for startups, based on the benchmark Life Cycle Assessment (LCA) method. Users can explore new options to make a positive climate impact reducing CO2eq emissions of their business model and deep tech innovation. It can also measure health, ecotoxicity, and resource depletion like rare earth minerals.

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Service 7 - Corporate Access: Leveraging the large network of corporates provided by EIT KICs, this service provides a platform for womenled startups to connect with potential partners and customers. As women are underrepresented in the corporate world, this service offers a great opportunity for women-led startups in Europe to expand their reach, showcase their innovative solutions, and secure valuable partnerships that can help them achieve their business goals.

At the moment of submission, the applicant will select her top three services that she would like to get from Women TechEU project. During the execution of the Programme of Services selected services from the EIC Business Accelerator Service will also be offered.

Expected duration of participation: Unknown

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# 31. HORIZON-JU-CLEANH2-2025-01-03 (HORIZON-JU-RIA)

# Scale-up and Optimisation of manufacturing processes for electrolyser materials, cells, or stacks

| Status | Opening date  | Deadlines    | Funding type  | Keywords |
|--------|---------------|--------------|---|----------|
| Open   | 30 janv. 2025 | 23 avr. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

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# **Description:**

### Expected Outcome:

Clean hydrogen is expected to play a critical role in Europe's decarbonisation objectives and electrolysers, which produce hydrogen from water and electricity, are a key enabler for Europe to meet its net-zero targets. Given this, it is vital to increase the amount of electrolysis capacity produced annually through scale-up of material, components, and stack manufacture.

Providing sufficient electrolyser capacity to meet the needs of the energy transition requires a rapid and efficient scale up of stacks (and component) production capacity. This will require electrolyser components and material manufacturers to transition to large-scale production featuring increased automation, or novel technologies. Optimisation and upscaling of manufacturing processes is required to increase production yields and improve cost-effectiveness. At the same time, new materials, components, and stack designs for improved efficiencies and reduced environmental impact must be produced in sufficient quantities to meet the growing needs of clean hydrogen production facilities.

Project results are expected to contribute to all of the following outcomes:

Maintain European leadership in electrolyser production and strengthen the European value chain through the ability to deliver high-quality stacks; Employ sustainable-by-design and/or design for recycling methods to improve circularity; Minimise the life-cycle impact of materials, component, or electrolyser manufacture through waste (e.g scrap or consumables); Increase production rates whilst reducing manufacturing costs for materials, components or stacks through manufacturing process development, considering learnings from other industrial sectors such as fuel cells, batteries, etc; Contribute to CAPEX reductions of water electrolysis systems through economies of scale and reduced waste; Contribute to creating a viable business case for clean hydrogen production and use, through delivery of more affordable, higher-quality systems with improved lifetimes; Improve the cost-effectiveness, efficiency, reliability, quantity and quality of clean hydrogen production through improved manufacturing processes and scale-up of material, component, or stack production or the component or stack active area; Contribute to the creation of high-value manufacturing and supply chain jobs;

Project results are expected to contribute to the following objectives and 2030 KPIs of the Clean Hydrogen JU SRIA:

Technologies should have efficiencies at nominal capacity comparable to those in the 2030 SRIA: AEL 48kWh/kgPEMEL 48kWh/kgSOEL 37kWh/kgAEMEL 48kWh/kg

Technologies not mentioned in the 2030 SRIA should provide similar, suitable KPIs in line with current state of the art Capital Cost 2030 KPIs for the relevant technologies: AEL 800  $\leq/(kg/d)$ PEMEL 1000  $\leq/(kg/d)$ SOEL 800  $\leq/(kg/d)$ AEMEL 600  $\leq/(kg/d)$ Demonstration of a Takt time for material, component, and stack production, which will enable Europe to meet its hydrogen production markets;Contribute to the achievement of manufacturing KPIs including: Manufacturing part yields of >98%, defined as 1-rejected parts / produced parts;Manufacturing material yield >80%, defined as (material used in stacks\*yield)/amount of material;FAT failure rates linked to stacks of <10%, defined as (Number of FAT failures / Total number of FAT events).

Technologies not mentioned in the 2030 SRIA should provide suitable KPIs in line with current state of the art.

# Scope:

The scope of this topic is the development and demonstration of manufacturing processes which are suitable for scale-up and which can 7 févr. 2025 | Open and forthcoming funding opportunities for artificial intelligence area

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contribute to meeting predicted annual clean hydrogen production requirements. Considering manufacturing scale-up of new materials, the proposal should provide sufficient information to show that these materials have been proven to work at an appropriate scale.

Proposals should consider and build on relevant existing work in this area and results from projects related to the manufacturing and scalingup of electrolysis systems including projects funded by the Clean Hydrogen JU such as AMPS[1], DJEWELS[2], HERAQCLES[3], MULTIPLHY[4], NEPTUNE[5], OUTFOX[6], PilotSOEL[7], REFHYNE[8] and SUSTAINCELL[9], clean-tech manufacturing projects supported by the Innovation Fund such as [ARA(HJ1] [CP2] TopSOEC[10], HyNCREASE[11] and GIGA-SCALES[12], national funded projects such as ELYAS[13], and Open Innovation Test Beds projects supported by Horizon Europe such as H2Shift[14] and CLEANHYPRO[15]. In addition synergies with the Made in Europe partnership[16] and the Zero-Defect Manufacturing Platform[17] should be explored. Successful projects are also expected to review the state of the art during their implementation and to identify additional synergies with these and other ongoing relevant projects.

Proposals should develop solutions to address material and manufacturing bottlenecks including component supply, manufacturing processes, and end-of-line testing. Technologies to be developed should lead to increased manufacturing throughput and/or yield. Research and Development (R&D) activities should be included, for example, design for manufacture, additive manufacture, improved handling methods, automation and in-line quality control. The developed technologies may be capable of processing several types of material or be used for the manufacture of more than one type of electrolyser system.

Proposals should include relevant baseline information relating to techno-economics and the environmental / life cycle impacts of the current state of the art for the processes being considered. They should also provide a quantified description of the expected improvements.

Proposals should include validation of the developed technologies in an industrial environment on an OEM-relevant stack, i.e. TRL5/6 and MRL5 depending on the electrolyser technology and on the current TRL/MRL of the process. Proposals should state the capacity of their demonstrator and justify the way in which the equipment and stack size used for validation demonstrates manufacturing capacity sufficient for production of sufficient electrolyser manufacturing capacity to allow Europe to meet its hydrogen production targets using high-quality components.

Validation consists of demonstration of increased throughput or yield of the material, component, or stack without reduction in quality. For example, in-line inspection may increase the number of flaws detected so a link could be made between defect type/severity and its impact on quality to determine critical defect types.

The project outputs should include validation of increased manufacturing capability in a relevant environment and include life-cycle analysis, waste management/recycling potential and a techno-economic report describing the expected throughputs, yields, defect rate and costs when implemented in a manufacturing facility.

The inclusion of consortium partner(s) relevant to the electrolyser stack manufacturing value chain is considered beneficial.

The following aspects are to be addressed in the scope of the project:

Further develop and optimise industrially relevant, scalable manufacturing processes to increase production rate while reducing cost for materials, components or stacks, or a combination of these. Examples of potential innovations include: Design for manufacture techniques applied to material, components, or stacks for high volume manufacture;Increased automation to improve throughput, tighten tolerances and reduce scrap;Streamlined manufacturing processes to remove non-value-added steps and reduce waste;Use of Artificial Intelligence (AI) / machine learning for scalability of processes; Develop quality control tools (preferably in-line) to increase production yield and decrease scrap rates. Increased detection of defects should be considered and for example, machine learning could be used to link defects to material, component, or stack quality and avoid increased scrap. Development of statistical sample-testing methods could also be considered;Apply Design for Sustainability principles to improve the environmental and end-of-life impact of electrolyser manufacture to maximise the potential of recycling processes to recover CRMs and other materials and investigation of material or component recycling when considering rejected items and dismantled stacks. Recycling development is out of scope of this topic;Provide an industrially relevant baseline and relevant KPIs for each technology and describe the quantified expected improvements;Validate novel processing solutions in an industrially relevant environment and demonstrate operation and reliable scalability with respect to cost, performance and durability KPIs. Quantify expected scrap and recall rates to reflect the true cost to the end-user.

This topic is focused on manufacturing technologies and concepts that will facilitate production scale-up rather than on new materials. It is

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particularly relevant to original equipment manufacturers (OEMs), component suppliers and integrators, although support from research and technology organisations (RTOs) developing innovative manufacturing technologies is welcome. Projects and processes should be relevant to electrolyser-manufacturing OEMs and should consider future demand when considering novel manufacturing processes.

Proposals should include manufacturing scale-up of materials and components in the supply chain as well as of electrolysers; proposers should clearly explain the importance of the components, materials, or stacks which are the focus of their project in terms of increased electrolyser production and deployment.

#### Scale-up can include:

Production of an increased number of stacks, components or materials; The development of manufacturing processes for stacks with larger active areas at the cell level; Development of processes with higher throughputs due to reduced scrap or increased recycling potential. The above improvements will enable manufacturers to deliver sufficient hardware for large-scale deployment as well as to benefit from economies of scale, improving the competitiveness of clean hydrogen.

It is expected that this topic will support complementary projects in order to cover low-temperature electrolysis and high-temperature electrolysis.

For additional elements applicable to all topics please refer to section 2.2.3.2.

Activities are expected to start at TRL4 and achieve TRL5-6 by the end of the project - see General Annex B.

Activities are expected to start at MRL4 and achieve MRL 5 by the end of the project - see Call management and general conditions section.

The JU estimates that an EU contribution of maximum EUR 4.00 million would allow these outcomes to be addressed appropriately.

The conditions related to this topic are provided in the chapter 2.2.3.2 of the Clean Hydrogen JU 2025 Annual Work Plan and in the General Annexes to the Horizon Europe Work Programme 2023–2025 which apply mutatis mutandis

[1] https://cordis.europa.eu/project/id/101111882

[2] https://cordis.europa.eu/project/id/826089

[3] https://cordis.europa.eu/project/id/101111784

[4] https://cordis.europa.eu/project/id/875123

[5] https://cordis.europa.eu/project/id/779540

[6] https://cordis.europa.eu/project/id/101101439

[7] https://cordis.europa.eu/project/id/101112026

[8] https://cordis.europa.eu/project/id/779579

[9] https://cordis.europa.eu/project/id/101101479

[10] https://climate.ec.europa.eu/news-your-voice/news/topsoec-fuelling-europes-renewable-hydrogen-ambitions-energy-efficient-

electrolyser-components-2024-09-30\_en

[11] https://ec.europa.eu/assets/cinea/project\_fiches/innovation\_fund/101132982.pdf

[12] https://cinea.ec.europa.eu/featured-projects/giga-scales-smarter-membranes-lower-cost-hydrogen-production\_en

[13] https://www.bosch-hydrogen-energy.com/about-us/collaboration-funding/elyas/

[14] https://cordis.europa.eu/project/id/101137953

[15] https://cordis.europa.eu/project/id/101091777

[16] https://www.effra.eu/made-in-europe-state-play/

[17] https://www.zdmp.eu/

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# 32. HORIZON-SESAR-2025-DES-ER-03-WA1-1 (HORIZON-JU-RIA)

# ATM impact on climate change

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

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# Description:

Expected Outcome:

To significantly advance the following development priority: FR-1 ATM impact on climate change. Specific requirement for this topic

Any proposal addressing non-CO2 impacts shall take into consideration on-going work under the "Aviation Non-CO2 Expert Network (ANCEN)" and feed into the community work. ANCEN goal is to facilitate a coordinated approach across a wide range of relevant stakeholders (e.g., scientific community, academia, OEMs, aircraft operators, fuel producers, ANSPs, NGOs, regulators, analysts and policymakers) to provide objective, timely, common and credible technical advice. This work can inform, where relevant, policy discussions on the development, agreement and implementation of effective action within Europe and internationally to mitigate the overall climate impacts caused by aviation (CO2 and non-CO2 emissions).

Scope:

1. Noise and air quality pollutants

Research aims at increasing the body of knowledge on the impact of ATM on areas such as noise and air quality pollutants (nitrogen oxides (NOX), particulate matter (PM), volatile organic compounds (VOCs), sulphur dioxide (SO2), carbon monoxide (CO) and unburnt hydrocarbons (HC)). Research aims at better understanding the ATM environmental impacts beyond greenhouse emissions (CO2 and non-CO2 aviation emissions). Research shall consider the new types of aircraft propulsions, new aircraft configurations and new propulsion fuels (e.g., hydrogen), whose impact on noise and air quality need to be researched; regarding the new aircraft types, research shall consider the work performed under Clean Aviation programme (www.clean-aviation.eu).

Research shall also consider the consideration of new entrants (e.g., higher airspace operations (HAO). An increasing number of rocket and space vehicle launches are planned, which clearly will significantly impact the population in the neighbourhood of concerned launch sites (e.g., Grotaglie airport) with massive noise exposure and potentially as well with particle and gaseous pollutants relevant for local air quality. Research shall also pay attention to the social acceptance aspects of such launch and re-entry activities.

### 2. Atmospheric physics for aviation (extreme weather events)

Research aims at increasing the body of knowledge on the physics of the atmosphere, to better understand and reliably quantify the effect of climate change on future trends regarding severe weather events (e.g., severe convective storms, heatwaves, dust storms, etc.) and weather hazards (e.g., clear air turbulence, hail, low-level windshear, extreme wind, heavy precipitations, in-flight icing conditions, etc.). Research shall propose innovative methods to model the effects of climate change on these future trends with high reliability and accuracy over the next decades. The objective is to improve the ATM system climate resilience and adaptation and minimise negative impacts on ATM (e.g., airport closures or significant reductions in airport capacity (with knock-on effects on the network)). Results will facilitate the definition of a climate change adaptation strategy for aviation and decision-making by ANSPs, airports and the other aviation stakeholders, covering

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from short to long-term (e.g., ensuring that ATM short-term induced decision will not jeopardise long-term ATM resilience and sustainability). The research should consider the challenges for accurate prediction that may result from changes to weather patterns arising from global warming in the short to medium-term.

Research shall elaborate a thorough state of the art review to evaluate the progress made atmospheric physics for aviation (extreme weather events) by previous research or on-going research within SESAR or outside SESAR. Note that there is on-going work under project AEROPLANE, which is reviewing the effect of heatwaves on aeroplanes take-off performance.

Research shall consider the knowledge gaps reported in the "ICAO Committee on Aviation Environmental Protection (CAEP) aviation and climate change factsheet[1]", the EASA "European aviation environmental report 2022[2]" and the EASA Scientific Committee Annual Report 2023[3].

3. Multi-scale multi-pollutant air quality systems (CO2 and non-CO2)

Research aims at developing potential solutions for the evaluation of the impact that the air traffic regulation policy options can have on the environment and climate. The proposed solutions should be able to follow the evolution of aircraft emissions (e.g., CO2 and non-CO2) in the atmosphere on both the global/regional scale (e.g., transport of pollutants from the troposphere to the stratosphere, impact onto the radiative properties of the atmosphere, ozone production, etc.), and on the local scale (e.g., impact close to an airport area during landing and take-off phases). The main area of applicability of such a solution is to support the aviation community in estimating the extent of the environmental impacts that current and future air traffic movements might have. An effective multi-scale air quality system shall address all phases of flight, starting at the strategic phase and including the post-operations phase. Research may leverage the potential of AI technologies to provide accurate and real time estimations of trajectories and impacts (using all available information and/or predictions of atmospheric status and weather) in order to assess the relevance of new indicators. Proposals shall demonstrate the relevance of the proposed approach and scope for ATM.

Research shall elaborate a thorough state of the art review to evaluate the progress made on multi-scale multi-pollutant air quality systems (CO2 and non-CO2) by previous research or on-going research within SESAR (e.g., project CREATE) or outside SESAR.

Coordination with the "Aviation Non-CO2 Expert Network (ANCEN)[4]" is required to focus on priority research gaps that need to be addressed to develop robust decision-making capabilities.

4. Development of the environmental performance-monitoring toolkit (CO2 and non-CO2) to include new entrants

There is a need to further develop the set of European environmental impact assessment tools, to analyse, inter alia, the integration of new entrants into the future ATM system and the overall environmental benefits and impacts (not only in terms of CO2 but also non-CO2) they will have. This element covers the expansion of the ATM aircraft performance models (on emissions and noise) to include new entrants and new aircraft types/fuels. It involves research into the impact on the environment of new fuels and/or new aircraft types (hydrogen, electric, sustainable aviation fuels, new hyper-/supersonic aircraft (with consideration of sonic booms)), including developing new models to assess the impact that ATM operational changes may have when these aircraft are introduced into the traffic mix, and exploring the boundaries for change to avoid negative effects on operational performance and environment (i.e., sensitivity analysis). Research shall also consider the potential of new entrants to re-shape the ATM network (e.g., new hubs driven by the new re-fuelling needs and stations, new airspace needs, etc.).

Research should include the development of methodologies to assess the environmental and societal impact of U-space-enabled drone operations, including the identification of all potential impacts (e.g., visual pollution, noise over populated areas, intrusion into privacy, risks to wildlife (migrating birds, nesting areas, etc.)). In addition, research shall also address higher airspace operations (HAO), especially during launch and re-entry operations. Due to the complexity and diversity of environmental impacts, particular attention needs to be paid to the analysis of trade-offs, between environmental impacts, but also possibly with other performance areas.

Research shall consider the required coordination with EASA (since the Agency is already working on this research topic) to ensure complementarity on the research objectives and approach.

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5. Validation of novel metrics in support of environmental impact assessment in ATM and U-space (noise, emissions CO2 and non-CO2)

The collaborative management of environmental impacts and the implementation of strategies to reduce them require the development of indicators/metrics that will enable, on one hand, all ATM / U-space decision-makers to make informed decisions at different levels and to communicate on ATM / U-space community efforts towards environmental sustainability. Research aims at developing and validating new environmental metrics for use in R&I and/or operations. The areas for development include:

The use of extended projected profile (EPP) data for environmental performance assessment. The development of meaningful operational proxies that can support ATM / U-space decision making in ATFM, ATC and drone operations, development of methodologies for providing an accurate estimation of CO2 and non-CO2 impacts (including noise) with minimal input data (e.g., based only on surveillance data combined with flight plan data etc.). When sufficient input data is available, research may leverage the potential of AI technologies to make generate more accurate predictions or indicators. The research can also investigate the adaptation to ATM of software and methodologies currently in use by aircraft operators and service providers to optimise their environmental performance; also, the research should consider its applicability for U-space / drone operations.

Note that research has been performed or is on-going under projects CLAIM[5] or under initiatives such as Aviation Non-CO2 Expert Network (ANCEN)[4] that should be considered to identify synergies and avoid duplication on this field.

6. Integrated platforms for the nowcasting and forecasting of multiple atmospheric hazards

This research aims at developing integrated platforms to incorporate predictions of atmospheric hazards (e.g., SO2 contaminants, severe weather situations such as deep convection and extreme weather and climate hotspots potentially contributing to global warming, etc.). The focus is to enhance the situational awareness of all stakeholders in case of multiple hazard crisis by facilitating the transfer of required relevant information to end-users, presenting such information in a user-friendly manner to ATM / U-space stakeholders, ultimately anticipating severe hazards and fostering better decision-making. Research may address:

Extension of nowcasting models of SO2 in 1D (values for a given location) to 2D (lat-long) and 3D and nowcasting products for dust, ash, volcanic aerosol and precursors and smoke. The consideration of additional observations (e.g., radar, satellite, sensors on board the aircraft) to better characterise the weather extremes and enhance the quality of the extreme weather nowcasting. The integration of space weather and climate change in the new MET services. The application of artificial intelligence or deep learning models based on recurrent networks could be used to better predict weather phenomena. Address potential human operator decision support systems able to import and process the meteorological forecasts and to adapt tactical arrival and departure scheduling to changing extreme weather conditions. Target airport, TMA and en-route operating environments and the potential use by different stakeholders (e.g., Network Manager, ANSPs (flow management and air traffic control positions), airports, airlines (dispatchers and pilots), etc.). Address the assessment of potential benefits in terms of capacity, efficiency, safety, predictability, and resilience. The inclusion of weather phenomena impact expected to affect U-space and drone operations into the now/forecasting integrated platforms.

Research shall consider the output of project ALARM. Note that there is on-going work on this research element under project KAIROS.

### 7. Contrails

The research aims at enhancing the methodology for detecting and recognizing aviation-induced contrails. This could be achieved through the utilization of deep learning models for image recognition on satellite data, as well as incorporating insights from physics sciences to model the evolution of linear contrails into cirrus clouds. The goal is to predict the formation of aviation-induced contrails, quantify their associated radiative forcing and their overall climate impact. It is important to consider previous/on-going work (projects E-CONTRAIL, CONTRAILNET, CICONIA), which used deep learning ML models and numerical weather prediction (NWP). In addition to these efforts, predicting contrails, especially persistent ones, hinges on atmospheric humidity. However, significant challenges remain today. To address those, research should focus on extending and enhancing humidity measurement techniques and on developing sophisticated numerical weather modelling approaches to enhance the accuracy of humidity and therefore of the contrail predictions. Research shall aim at quantifying the uncertainty in the prediction of contrails and the assessment of their impact on the climate to support inform operational decision-making.

In addition, the research should address the phenomenon of embedded contrails. These contrails form under specific conditions when aircraft fly through pre-existing cirrus clouds, resulting in contrails becoming embedded within those cloud layers. Despite their significance,

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our understanding of how embedded contrails impact the radiative forcing of natural cirrus clouds remains limited—an unquantified non-CO2 effect of aviation. These embedded contrails have the potential to alter the cloud optical thickness (COT) of existing cirrus, potentially shifting their climate impact from net warming to net cooling. To advance the knowledge in this area, note that there is on-going work conducted by project AEROPLANE, which detected embedded contrails by analysing individual aircraft locations from aircraft position datasets and correlating them with height-resolved observations obtained from spaceborne light detection and ranging (LIDAR) and radar instruments. Research is also needed on contrails that are embedded in another contrail generated by an aircraft that flew in the area before, as well as on overlapping contrails produced by different aircraft.

The observation and identification of contrails play a crucial role in supporting contrail prediction. As the number of observational sensors increases, we gain the ability to correlate contrail occurrences with other relevant data, creating large databases that can be used for training machine learning (ML) models for contrail prediction. These observational means include in-situ measurements (like IAGOS, MOZAIC), geostationary satellites offering a global perspective, low orbit satellites providing more detailed data from low earth orbit, ground cameras which capture contrail events with higher resolution for specific locations and LIDAR, on satellites, aircraft or ground-based installations. In particular, but not exclusively, the research should explore the extended use of ground cameras and LIDARs for supporting contrail observation and identification tasks.

- [1] www.icao.int/environmental-protection/Documents/Factsheet%20Business%20and%20Economics%20Final.pdf
- [2] https://www.easa.europa.eu/eco/sites/default/files/2023-02/230217 EASA%20EAER%202022.pdf
- [3] https://www.easa.europa.eu/en/domains/research-innovation/easas-scientific-committee-scicomm
- [4] https://www.easa.europa.eu/en/research-projects/nonco2

[5] https://www.claim-project.eu/

[6] https://www.easa.europa.eu/en/research-projects/nonco2

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# **33. HORIZON-SESAR-2025-DES-IR-02-WA1-1 (HORIZON-JU-RIA)** Transformation to trajectory-based operations

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

# URL in Kaila:

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# Description:

### Expected Outcome:

To significantly advance the following development actions:

IR-1-02 Development of FF-ICE, including FF-ICE pre-departure enhancement and FF-ICE/R2.IR-1-03 Advanced network trajectory synchronisation in the execution phase.IR-1-04: Connected and integrated flight management system (FMS), electronic flight bag (EFB) and flight operations centre (FOC) functionalities for trajectory optimisation.IR-1-05: Dynamic route availability document (RAD) towards a RAD by exception environment.

Note that IR-1-01 is covered in WA 3 because ATC TBO R&I activities require the development of the next generation of ATS platforms.

### This includes advancing the capabilities of the following systems:

Airborne systems: improved FMSs and EFBs.Ground systems: improved FOC/WOC, ATS and NM systems. Scope:

The following list of R&I needs is proposed as an illustration of the potential project content, but it is not meant as prescriptive. Proposals may include other research elements beyond the proposed research elements below if they are justified by their contribution to achieve the expected outcomes of the topic and are fully aligned with the development priorities defined in the European ATM Master Plan. TBO integration activities and global interoperability

This element covers the TBO content integration activities across the programme, including development of the SESAR TBO concept of operations, integrating network, ATC and intra-European (regional) TBO processes, and update of the document based on R&I results (e.g., integration of the IR1 results after the projects conclude). The document must include a human-machine teaming annex describing the ATC TBO automation concepts and the evolution of the role of the human. The development of this annex requires close coordination with WA 3 projects.

At global level, this element covers the international coordination, including in particular support to the TBO related activities of the ICAO ATMRPP panel.

ANSP-triggered impact assessment

This research element addresses the development of NM capabilities to respond to a request from the ATC ground system to probe in realtime what the impact on the network would be of an ATC clearance that deviated from the agreed trajectory as per the eFPL. It is a support feature that does not deliver clearances but supports the ATC system in the clearance delivery process. This is an extension of the NM network impact assessment (NIA) B2B service, which is already in place today to allow ANSPs to trigger a network impact assessment for a re-routing proposal (RRP) within a pre-defined RRP catalogue.

This element would benefit from NM-ANSP integrated validation activities addressing the full process from the NM side (covered in WA 1) and ANSP side (covered in WA 3).

Unconstrained desired trajectory (UDT)

All TBO actors should aim at continuously optimising the trajectory. To do this, the FOC must ensure that the information of the optimum trajectory is made available to NM and the ANSPs, who will take it in consideration. However, the TBO Agreed trajectory represents the accepted flight plan to be taken as a reference for the flight, which often includes ATM constraints and therefore may not represent the

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trajectory the AU would desire.

The preliminary flight plan as per the FF-ICE/R1 planning services provides means to share a trajectory with fewer constraints before the submission of the flight plan. The objective of the preliminary flight plan is to support increased dynamicity in the application of constraints (e.g., preliminary flight plans could be used to get early information on traffic demand to assess which RAD measures are the best candidates for waving via the dynamic RAD concept). However, it is expected that the preliminary flight plan will still have some constraints (e.g., constraints that are considered by the AU not to be candidates for removal in the pre-departure phase). In contrast, the UDT should be completely unconstrainted.

The UDT and preliminary flight plan are compatible and complement each other. Even in the case of flights where the preliminary flight plan has a truly unconstrained trajectory that could be used as a reference for ATM on what the AU would like to fly at the time it was submitted, the preliminary flight plan may not continue to be a valid reference in case the desired trajectory changes due to a re-optimisation process[1] (e.g., winds different from forecast, turbulence, etc.), because the preliminary flight plan will remain frozen after there is an accepted FF-ICE flight plan.

The objective of the UDT is to provide a means for the completely unconstrained trajectory desired by the AU to always be available as a reference to ATM. This research element covers:

Extension of the eFPL to include the true desired trajectory (completely unconstrained) when the flight plan is filed before departure. The development of an FF-ICE/R2 precursor service to allow the FOC to submit to NM an updated UDT at any time, during the pre-departure or the post-departure phase. The research may investigate alternative means for the AU to provide the UDT in the planning phase and update it during the flight, e.g. the UDT could be provided though the EFB being directly connected to ATC using the applicable air/ground SWIM standard using the connected aircraft concepts. The use of the UDT by NM to improve the efficiency of the flight in planning and execution. In addition to supporting continuous optimisation concepts, the UDT is useful for post-operations performance assessment purposes. The development of performance metrics for assessing flight efficiency based on UDT is also in scope.

Note FF-ICE/R2 has not yet been defined by the ICAO ATM requirements and performance panel (ATMRPP). This element is considered an FF-ICE/R2 precursor. The output of the R&I will contribute to building the global concept.

This element would benefit from integrated validations including the NM and FOC prototypes (covered in WA 1) and the ANSP prototypes (covered in WA 3).

FF-ICE/R2 precursor for the revision of the agreed trajectory in strategic execution

This research element aims at defining the operational processes, services, and systems to support strategic trajectory revisions in execution that can be initiated by either the flight operations centre (FOC), the Network Manager (NM), or local air traffic flow management (ATFM) units. The trajectory revision processes concerned by this element are changes to the trajectory where the point of deviation from the current flight plan is beyond the horizon of interest ATC. This process requires all actors concerned with the revision of the trajectory to have deployed the FF-ICE/R1 services. The solution will provide to airspace users flexibility to reoptimize the trajectories in execution and will increase the network manager trajectory through the anticipation of trajectory changes.

This element covers only the interaction between the FOC and the NM and the intra-European coordination between NM and the concerned ANSPs. It includes the collaborative process from the moment the revision is requested by the FOC, NM or ANSPs to the moment the trajectory is agreed, and the revised flight plan is sent to all concerned actors.

The research needs to establish how the new trajectory will be sent to the flight deck and how the flight crew will implement it; if the new agreed trajectory changes the 2D route of the aircraft, the change means the aircraft will fly a trajectory that is different from what was in the departure clearance (which included the original 2D route):

The departure clearance is not amended: in this case, the trajectory revision is sent to the flight deck via the dispatcher and either no clearance is delivered (safety case to be developed, e.g. based on comparing ground with air downlinked trajectory or with "check route" CPDLC FANS message where FANS is available) or each ATSU delivers a clearance for the portion of the trajectory within the AoR; orThe departure clearance is amended: in this case, the clearance for the new trajectory has to be transmitted by ATC using a downstream clearance. In this case, once the new trajectory is agreed by NM and the impacted local ATFM units and the FOC, NM should send a message to the ATSU currently in contact with the flight with the request for the clearance to be provided. This clearance amends the departure

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#### clearance.

The planned validation activities must include the validation of the airborne aspects. For cases where the 2D trajectory changes, the validations must address how the new trajectory will be implemented in the navigation system and later flown by the flight crew through either live trials or high-fidelity cockpit simulators, based on one of the two options outlined above or on a different option to be described in the proposal.

This element would benefit from integrated validation covering the network aspects (covered in WA 1) and the ANSP aspects (covered in WA 3).

Note FF-ICE/R2 has not yet been defined by the air traffic management requirements and Performance Panel (ATMRPP). This FF-ICE/R2 precursor can be deployed before full FF-ICE/R1 is available. The end target FF/ICE/R2 process will require all actors concerned with the revision of the trajectory to have deployed the FF-ICE/R1 services. The output of the R&I will contribute to building the global concept. The project must plan adequate resources to contribute to the international coordination activities.

FF-ICE/R2 trajectory revision and/or update in execution for arrivals into Europe from non-FF-ICE areas (ASPs that are not eASPs) This research element allows flights arriving in Europe (potentially from non-FF-ICE areas) to benefit to use FF-ICE collaborative processes for the optimisation of the route in European airspace. The element considers the discontinuity in terms of which FF-ICE services are deployed in the ATSUs that the flight will fly through. The objective is to allow the process to take place even when not all the ANSPs between the current position of the aircraft and the point of deviation from the current trajectory are at the same level of FF-ICE deployment.

The research element addresses one or more of the following processes:

eFPL update initiated by the FOC to update the times in the flight plan during the execution phase before the flight enters European airspace. The objective is to provide the European network with a more accurate time for entry into the European area when the flight is still hours away from Europe. Modification of the 2D route in the eFPL for an airborne flight that is inbound the European airspace but has not yet the border of the initial flight plan processing system (IFPS) at the time the revision is made by the FOC. The objective is to allow as an example, a long or medium-haul flight departing from outside the European airspace, providing NM a more accurate picture of the traffic demand. This is a revision process subject to approval via a trial-request process, but it contains an element (entry point into the IFPZ) that has been modified, so that the point of deviation from the original route is outside of the IFPZ due to the flight has been re-routed by a non-European ATM service provider (ASP). The entry point into the IFPZ would to some extent be a "fait accompli", while the route in the IFPZ would be subject to approval by NM.

Research aims at determining the boundary between revision and update needs. The research may also investigate the potential benefits of defining a similar process for departures from Europe with destinations out of the IFPZ.

This research element would benefit from simulations integrating airborne prototypes and NM prototypes.

### Evolution of military flight planning

The improved operational air traffic (iOAT) flight plan supports improved civil-military collaboration but is based on the FPL2012. The objective is to build on the iOAT flight plan to define a new FF-ICE-based flight plan and processes for mission trajectory management (including ARES CDM processes and the utilisation of features such as flexible parameters) that moves civil-military collaboration to the next level. The new format and processes should support dynamic coordination between military actors and local DAC actors, specifically national airspace management (ASM) and local air traffic flow & amp; capacity management (ATFCM), throughout CDM on a single 4D Mission Trajectory data, but also provide means for collaboration when military needs do not allow sharing of full set of trajectory data. Integration of flight operations centre (FOC), electronic flight bag (EFB), flight management system (FMS) and ATC platforms The main flight optimisation tool used by pilots today in the execution phase is the FMS, but emerging FOC/EFB applications are challenging this status quo. The development lifecycle of the FMS is slow in comparison, due to the strict software development conditions required by its flight path management capabilities. In contrast, FOC-EFB[2] tools can be rapidly developed, potentially including the use artificial intelligence (AI) tools whose certification for the FMS would be very challenging.

The EFB-optimised trajectories may include speeds different from those planned by the FMS, which need to be implemented by the pilot by overriding FMS speeds. In some cases, this is done by manual entry into the FMS, while in other cases the flight crew enters the optimised longitudinal or vertical speeds on the flight control unit (FCU) / mode control panel (MCP). The EFB may also recommend that descent start before or after the FMS TOD downlinked via ASD-C, which is the point ATC expects descent to start if the flight is cleared to "descend when

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ready" or "descend at own discretion". The use of the EFB for flight optimisation by flying selected or manual instead of in managed mode reduces the predictability of the flight for the ATM system.

The objective of this concept element is to develop full FOC-EFB-FMS-ATM integration during the flight execution. This may include, for example:

The seamless integration in the FMS of optimisation constraints calculated by FOC-EFB tools[3]. The optimisation constraints will be considered by the FMS as long as they are consistent with the ATC constraints and ATM planning constraints. The element also includes support for flight crews to request an amendment of the ATC clearance where needed (e.g., if the FOC-speed is outside the +/- 5% from the flight plan speed, if they need to request a different flight level for the cruise, or a different rate of climb or descent, etc.) or a revision of the FF-ICE flight plan (in an FF-ICE/R2 revision process) if appropriate (strategic change to the trajectory in execution). The direct connection from the FOC or the EFB and ATC systems as an alternative way to route FMS trajectory information from the FMS to ATC systems, and potentially additional trajectory information elements, e.g. aircraft equipped with Revision A could downlink Revision B elements via the EFB. The FMS trajectory information could be transmitted from the FMS to the EFB or be calculated by the EFB through an FMS-twin service (hosted onboard at the EFB or on the ground at the FOC[4]). The FMS-twin could allow a more rapid implementation of new trajectory exchange messages than if an update of the FMS were required, e.g. new interrogation messages from ATM to the aircraft that are not in ATS B2 standards for ATM to interrogate the aircraft systems on how the trajectory would change under certain hypotheses. Research shall investigate the feasibility and acceptability of this solution. Please note that it is not foreseen that the ATC to EFB connection be used for the transmission of ATC clearances (i.e. routing of ADS-C information via the EFB to ATC is in scope, but routing of CPDLC messages through the EFB is out of scope).EFB/FOC developments to support the A/G exchanges between the FOC and the flight deck during the execution phase for both A/G FF-ICE/R2 negotiations for the update of the trajectory during the execution phase beyond the horizon of interest of ATC and A/G exchanges in support of the ATC TBO concepts.

Note that trajectory optimisation tools at the FOC, the EFB or the FMS are covered in WA 5-3 "Environmentally driven trajectory planning", while the integration of FOC-EFB-FMS is covered in this element. A key objective of this element is to avoid the increased use of advanced FOC-EFB trajectory optimisation tools results in a reduced use of FMS managed mode.

The EFB connection to ATC systems is expected to use the applicable air/ground SWIM standard. The research must investigate if the update of the standard currently under development (building on the work of MIAR SESAR solution 0335 "SWIM TI purple profile for air/ground safety-critical information sharing") is appropriate to cover each of the use cases that are investigated, or a further update is needed. Connected aircraft Network TBO (airline information services domain (AISD))

This element addresses the development of AISD flight-deck connectivity to support the connection from the flight deck to: NM/local ATFM units, to participate in the FF-ICE/R2 trajectory negotiations (flight-deck acting as its own FOC) or trajectory negotiations. The FOC, in support of the TBO FOC trajectory negotiations (so the negotiation happens between the FOC and NM/local ATFM units): this element covers the FOC coordination with the flight deck). Increased dynamicity in the application of RAD/LoA constraints The objective of the research is to allow for increased dynamicity in the application of one-size-fits all constraints, be them pre-departure RAD measures (with or without a corresponding LoA) or LoA constraints without a corresponding RAD measure. This concept supports the evolution from the current paradigm or managing traffic flows to the tailored management of individual flights with the objective of increasing flight efficiency. This will pave the way for the target RAD by exception concept, where the RAD is reduced to a minimum, and the AU typically submit the flight plan with the unconstrained desired trajectory (UDT). In a RAD-by-exception environment, NM replies to the flight plan submission with the UDT with a proposed trajectory where the constraints that are strictly necessary have been applied, which the AU can either accept or make a counterproposal to.

The research should address the applicability of the increased dynamicity all along the trajectory lifecycle:

Automation support for the provision of the Preliminary flight plan (PFP) by AU and processing by NM and local ATFM units. In the predeparture phase, up to 2-3 hours before departure, FMP automation tools should identify which RAD measures (with or without a corresponding LoA) could be waived based on the prediction of traffic demand developed by before flight plans are submitted combined with information on preliminary FF-ICE flight plans when available. Shortly before departure, when the demand is better known, automated tools could support the identification of individual flights with an already accepted flight plan that is subject to a RAD constraint for which the RAD constraint could be removed. In some cases, it may be possible to remove a RAD measure for a full traffic flow. The concerned AU would be informed of the improvement opportunity, and if interested they would revise the flight plan as per the FF-ICE processes. In the strategic execution phase, FMP automation should continuously look for RAD waving opportunities. When an opportunity is identified, the airline should be informed and if interested they should revise the flight plan as per the FF-ICE revision process. In the tactical execution

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phase, ATC automation should identify the individual trajectories or traffic flows for which RAD/LoA constraints could be waived, coordinate the new improved trajectory between ATC sectors or across ATSU borders (typically through an approval-request process) and deliver the ATC clearance to the aircraft. In some cases, a positive network impact assessment will be needed to ensure no negative downs tream impact. The research may investigate whether this process could be reversed, at least for some routes, e.g. in the vertical dimension, even with a RAD or LoA measure in force, ATC does not issue the clearance for the constraint- for example an early descent to cross the border with the next ATSU or sector at or below a certain level – unless the ATC automation shows an alert requiring the clearance. The research may address concepts to increase the predictability for the AU of which RAD measures are likely to be applied, e.g. by providing a catalogue of conditions (times, days. MET conditions) in which the RAD measure is more likely to be applied (conditional RAD).

Note there is on-going research on PFP, LoA constraint management and dynamic RAD in the ongoing Network TBO and HERON projects. Develop a digitalised letters of agreement (LoA) repository and their provision to NM

In order to deploy the Network 4DT (4D Trajectory) CONOPS, the objective of the research is to create an interactive digitalised repository of LoAs to be embedded in the Network Manager (NM) systems in order to allow for an improved processing the submitted flight plans. Electronic copies of LoA shall be provided to the NM by ANSPs in the strategic phase and maintained as appropriate. For this purpose, NM needs to establish and closely follow-up the process of LoA provision, as well as the provision of subsequent amendments and modification. The LoA effect is implemented through the addition of 4D points to the list of ordered elements within the NM Trajectory. Digital LoAs will be shared with all relevant actors.

This research elements covers in particular the provision of LoAs to NM. NM needs to establish and closely follow-up the process of LoAs provision and as well as the provision of subsequent related amendments and modification.

Specific minimum requirements for this topic:

Integration of flight operations centre (FOC), electronic flight bag (EFB), flight management system (FMS) and ATC platforms: consortia for this topic shall:

Either include an established FOC system manufacturer or provide evidence that the consortium has the operational and technical capability to build the FOC prototypes required for the research at the required maturity level.Either include an established ATS system manufacturer or provide evidence that the consortium has the operational and technical capability to build the ATS system prototypes required for the research at the required maturity level.Either include an established FMS system manufacturer or provide evidence that the consortium has the operational and technical capability to build the FMS system prototypes required for the research at the required maturity level. [1] Note FF-ICE/R2 will allow the request for a revised trajectory but will not allow a change to the preliminary flight plan.

[2] EFB in this context refers to any COTS or purpose-built on-board computer without flight-path control capabilities that handles trajectory data either directly or through a connection to FOC computers. EFBs can be portable or permanently installed in the cockpit. In contrast, FMS is an on-board computer with flight path control capabilities.

[3] Optimisation parameters calculated by the EFB and entered in the FMS are referred to as optimisation constraints because they constrain the way the FMS can plan the flight path.

[4] Note that even if the FMS-twin located at the FOC, there is no plan for an extra connection from the FOC to ATC ground systems, and hence the connection from the FMS-twin to the ATM systems would have to be routed via the EFB.

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# **34. HORIZON-SESAR-2025-DES-IR-02-WA3-1 (HORIZON-JU-RIA)** Next generation ATS platforms for en-route and TMA operations

| Status      | Opening date | Deadlines     | Funding type  | Keywords |
|-------------|--------------|---------------|---|----------|
| Forthcoming | 1 avr. 2025  | 16 sept. 2025 | HORIZON-JU-RIA<br>HORIZON JU Research<br>and Innovation Actions |          |

# URL in Kaila:

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# Description:

Expected Outcome:

To significantly advance the following development actions:

IR-3-01 Next generation ATC platform addresses the next generation ATC platform, fully leveraging aircraft capabilities. This includes supporting a data-sharing service delivery model, resilient integrated CNS/MET as a service, traffic synchronisation, etc., accommodating the specific needs of the military, innovative air mobility (IAM), higher airspace operations (HAO), and U-space, etc.IR-3-02 Artificial intelligence (AI) capabilities enabling the next generation platforms.IR-3-03 Cyber-resilience and cyber-security capabilities enabling the next generation platforms.IR-3-04 Separation management for high levels of automation.IR-3-05 Demand capacity balancing (DCB) and airspace configuration concepts for high levels of automation.IR-3-06 Future human – machine teaming.IR-3-07 Ground capabilities for reducing ATM environmental footprint. This includes climate-optimised trajectories including non-CO2 effects (e.g., contrails), environmentally optimised climb and descent operation, advanced required navigation performance green approaches, dynamic allocation of arrival and departure routes considering noise and local air quality, green ATC capacity concept, flexible eco-friendly clearances, wake energy retrieval (WER)[1], integration of sustainable aviation fuels (SAF) and zero emissions aircraft, environmental performance dashboards, etc.IR-1-01 Integrated air/ground trajectory management based on ATS-B2 including the extension for lower airspace and airport surface. This includes advancing the capabilities of the following systems:

Ground systems: core ATS platforms for en-route and TMA operations. Scope:

Research aims at developing the next generation of ATS platforms both for en-route and TMA environments, considering state-of-the-art ground technologies while leveraging innovative solutions and new aircraft capabilities aiming to achieve level 4 of automation as outlined in the Master Plan and by considering a Trustworthy AI approach. The targeted ATS platforms shall enable the following capabilities: Ensuring that all flights/missions (crewed or uncrewed) operate in a way that maximises, to the fullest extent, aircraft capabilities to reduce the overall climate impact of aviation (CO2 and non-CO2) (see detailed R&I needs below). Ensuring that each flight trajectory is optimised considering the individual performance characteristics of each aircraft, user preferences, real-time traffic, local circumstances, and meteorological conditions throughout the network. This optimisation shall be systematic, continuous (from planning to execution phase), and extremely precise (see detailed R& I needs below). Potential conflicts between trajectories or traffic bottlenecks are resolved much earlier than today, bringing safety benefits. Service providers can dynamically and collaboratively scale capacity up or down in line with demand by all airspace users. These capacity adjustments are implemented in real time and ensure optimal and efficient dual (both civil and military) use of resources at any moment across the network (airspace, data, infrastructure, and human-machine teaming). End-points, data connection and ecosystem (considering civil-military needs) are cybersecure thanks to the enhancement of information security such as, but not limited to, strong identification, authentication and integrity. Post-quantum cryptography (PQC) algorithms[2] should be considered where appropriate. Research shall consider the on-going work by ICAO on the international aviation trust framework (IATF), which aims at developing standards and harmonised procedures for a digitally seamless sky and dependable information exchange between all parties. The continuous optimisation of every flight/mission from gate to gate is systematically guaranteed thanks to high connectivity between airground and ground-ground components. The human operator is performing only the tasks that are too complex for automation to handle, teaming up with automation (see automation roadmap of the Master Plan and detailed R& I needs below). Voice communication is no longer the primary way of communicating and most routine tasks should be managed through machine-to-machine applications. To enable TBO Phase 3 in a highly automated ATM environment in accordance with the TBO and automation roadmaps in the ATM MP (see detailed

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R&I needs below). Specific minimum requirements for this topic:

Consortia for this topic shall include:

At least three ANSPs.Either an established ATS system manufacturer or provide evidence that the consortium has the operational and technical capability to build the ATS system prototypes required for the research at the required maturity level. The proposed target architecture shall be aligned with the service delivery model outlined in the Master Plan for a typical ACC.

Detailed R&I needs to enable TBO phase3:

The following list of detailed R&I needs is proposed as an illustration of the potential project content, but it is not meant as prescriptive. Proposals may include other research elements beyond the proposed research elements below if they are justified by their contribution to achieve the expected outcomes of the topic and are fully aligned with the development priorities defined in the European ATM Master Plan.

For completing TRL6, proposals may need to consider the execution of integrated validation activities involving the output of one or more projects in WA1 and/or WA5. Proposals shall describe these activities in separate work package(s) and identify associated risks in case the other project(s) are not finally awarded.

ATC TBO contribution to TBO concept development

At European level, this element covers the contribution to the European TBO concept of operations (developed by WA 1), including the ATC TBO aspects and ATC human-machine teaming automation concepts.

At global level, this element covers the international coordination, including in particular supporting the ATC TBO related activities of the ICAO ATMRPP and ICAO ATMOPS panels.

Automated downstream ATC clearance via ATS B2 CPDLC in en-route.

This element covers the uplink, via ATS B2, of a revised 2D trajectory where the point of divergence from the current trajectory is beyond the sector where the aircraft currently is. The request for the clearance to be sent to the aircraft will come from a downstream ATC sector in the same ATSU or from a downstream ATSU. In the cross-ATSU-border case, the uplink will be done from the current ATSU (i.e. the current ATSU is relaying the clearance on behalf of the downstream ATSU)[3].

The target concept is for this uplink to be done automatically by the ATC systems without the intervention of the human operator currently controlling the flight or even his/her awareness (automation level 4) but in a first step a lower level of automation may be considered. The uplinked trajectory must either connect to the original trajectory in a downstream point or provide a new route all the way to the destination airport. Note the trajectory of the aircraft does not change the trajectory in the current sector.

This element may require the ATSU systems to be able to uplink clearances beyond their usual area of interest, potentially all the way to a distant destination airport. The correct implementation in the FMS active plan of the uplinked 2D trajectory will be verified by comparing it to the ADS-C EPP. The comparison must consider the whole portion of the revised trajectory, including the part that is beyond the area of responsibility of the current ANSP.

Operational issues with FANS 1/A downstream clearances in oceanic airspace have been raised at the ICAO ATM operational panel (ATMOPS) (e.g., with aircraft incorrectly loading the new route in the FMS (skipping points)). The research element also covers the mitigation of the risk for similar operational issues with ATS B2 (e.g., based on conformance monitoring against the EPP) and coordinate with the SESAR 3 JU to liaise with the ICAO ATMOPS panel if needed.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5). For the cross-ATSU-border case, the research should validate the case where two ATSUs have systems from different vendors.

Use of CPDLC v2/v4 in the TMA and extended TMA.

This research element covers the development of the ATC ground systems and flight-deck (HMI, potentially including digital assistants, and avionics, including extension of push-to-load capabilities if needed), in support of the extension of the use of CPDLC to the lower airspace (below the current mandate, addressing in particular below FL245) to allow the uplink and push-to-load of ATC clearances in the extended

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TMA and TMA (including approach) for a closed lateral trajectory revision (for separation and/or to accommodate path extension/path shortening), speed instructions, altitude clearances and clearance for approach. Speed instructions will be generated by the ground system (e.g. based on ML algorithms based on the SESAR optimised runway delivery tool). The expected automation level may vary between 2 and 4 depending on the environment and conditions (e.g., night traffic, low density) and the type of instructions (i.e., 2-4 for speed instructions, 2 for lateral clearances).

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Automatic cross-border STAR ATC clearance uplink service.

This research element aims at anticipating the STAR clearance and the delivery of expected runway and approach procedure information to the flight deck. The TMA will first check the STAR and expected runway and approach procedure in the EPP (received through G/G coordination) against the STAR that is allocated in the system. In case of discrepancy the arrival TMA ATSU will directly uplink the STAR clearance and runway and approach procedure information over CPDLC to the aircraft (if the ATSU in communication with the aircraft) or send a request to the adjacent upstream ATSU with a request for the correct STAR clearance and to be uplinked. The automatic STAR clearance will only include a clearance to follow the 2D STAR until the clearance limit. For clearances for descent to be delivered by the upstream ATSU, the usual cross-border coordination procedures will apply. For the cross-ATSU-border case, the research should validate the case where two ATSUs have systems from different vendors.

The research may also cover the uplink of the STAR by an ATSU that does not have a common border with the arrival TMA. In this case, the message from the arrival TMA requesting the uplink may be sent directly to the ATSU or via NM. The target concept is for the uplink of STAR to be done at any time and as early as possible, e.g. even when the flight is still on the ground at the departure airport.

The information on the STAR and request to uplink and confirmation that the uplink has taken place will be done using ED-254 messages over SWIM.

Note there is a synergy between this element and the ongoing work on dynamic arrival route structures in ongoing project GALAAD, as the automatic uplink of STAR could support the implementation of GALAAD's concept.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

ANSP-triggered network impact assessment.

The research element addresses the development of capabilities that allow the ATC ground system to probe in real-time what the impact on the network would be of an ATC clearance that deviated from the agreed trajectory as per the eFPL. It is a support feature that does not deliver clearances but supports the ATC system in the clearance delivery process. This is an extension of the NM network impact assessment (NIA) B2B service, which is already in place today to allow ANSPs to trigger a network impact assessment for a re-routing proposal (RRP) within a pre-defined RRP catalogue. This element allows the same to be done for any RRP (not necessarily pre-defined) and for vertical changes:

In the vertical domain, the concept applies when ATC receives a request for a cruising flight level that is different from the flight plan cruising level, or when the planned cruising flight level is not available (due to it being occupied by another aircraft in separation conflict) and ATC has a choice to clear the aircraft to at least two other flight levels (typically the one above or the one below). This will be integrated in the overall conflict detection and resolution processes. The concept may also be useful for ATC to probe before providing a direct routing (DCT) clearance that significantly shortens the flight time (e.g., over three minutes). This use case is expected to be of less interest than the vertical change use case, because DCT clearances that shorten the flight time significantly enough to make the network impact assessment worthwhile are rare (because there is a very low probability that such small changes will have a DCB impact downstream). The exception may be, for example, in case of an early release of an airspace reservation that allows a DCT that saves a significant amount of track miles. Research may address more advanced what-else capabilities for pre-defined scenarios (evolution of current NIA) or for more general use cases (ANSP-triggered network impact assessment).

This element would benefit from NM-ANSP integrated validation activities addressing the full process from the NM side (covered in WA 1) and ANSP side (covered in WA 3).

Enhanced ATC vertical clearances with intermediate constraints

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When an aircraft needs to climb or descend in busy airspace, there will often be separation conflicts along the way. ATC often manages this by providing a clearance for climb/descent to an intermediate level, and later reassessing the separation conflicts before issuing a new clearance. With the EPP, ATC gets a better idea of what the climb or descent profile of a specific aircraft will be. This reduces the uncertainty but there is no guarantee that the aircraft will execute the trajectory as predicted by the EPP. When the predicted separation with other aircraft is close to the minimum 5NM/1000 ft., it is necessary to ensure it will be respected. This concept allows ATC to uplink an ATS B2 clearance climb/descent clearance with one or more constraints to cross certain intermediate waypoints at or above, at or below or precise at a certain level or between two specified levels. The concept expands the use of vertical clearances to the more complex use cases, i.e. beyond the clearance to start descent at the FMS TOD or climb to reach cruising altitude at the FMS TOC.

The element covers the ground and airborne aspects, including further development of on-board procedures and avionics to for improved management of vertical constraint. The research should investigate both manual and push-to-load clearances, noting that the target concept is that all vertical clearances are push-to-load, but as an interim concept some complex vertical clearances with intermediate constraints may be loadable only manually (due to limitations of the ATS B2 standard). On the ground side, the correct loading of the vertical clearance on the FMS should be verified through the ADS-C data, potentially with different time-outs for clearances that are push-to-load and those that are initially loadable in the FMS only via manual input from the flight crew. The research considers ATS B2 Revision A or above.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Leveraging ATS B2 in support of increased automation levels

Research aims at exploiting ATS B2 capabilities to support increased automation levels in en-route and TMA environments, including, for example:

The automatic uplink of AMAN-generated speed advisories, e.g. translate TTL/TTG or AMAN planned times into speed advisories and their automatic uplink to the aircraft. The provision of tactical separation assurance (i.e., separation management activities when aircraft is in the AoR) leveraging ATS-B2 beyond what it is covered by the strategic deployment objective SDO #5. This includes the identification of potential conflicts in the AoR, the automatic selection of resolutions considering also downstream constraints, and the facilitation of all required coordination with upstream and downstream sectors. The research may include Human-AI teaming concepts, including the development of new HMI features to streamline the human operator planning activities. The scope also includes the provision of planning separation assurance when aircraft are already within the Area of Interest (AoI), extending the AoI up to 30 minutes before the Area of Responsibility (AoR). This research focuses on automated conflict identification, resolution selection, and transparent coordination, as well as traffic expedition and environmental optimisation during the execution phase. The research may include Human-AI teaming concepts. The automatic identification of potential conflicts before the aircraft is in the AoR, the automatic selection of potential resolutions considering also downstream constraints, and the transparent coordination among impacted sectors and the provision of downstream clearances to solve the conflict before the aircraft enters in the AoR. The research may include Human-AI teaming concepts. The use of CPDLC v2 clearances without ATCO validation (e.g., delivering downstream clearances without current sector validation (e.g., speed instructions for XMAN, @D route revision, speed optimisation (ATS B2 Rev A and Rev B), the automatic uplink of AMAN-derived speed constraints, etc.).The delivery of speed advisories (note that an advisory is not a clearance) to aircraft not currently within control of the ACC applying the speed advisories, e.g. for XMAN purposes. "Silent" radio, where the pilot does not call if between sectors based on ATS B2 Rev B downlink of the selected VHF frequency. This may include an interim concept based on ATS B2 Rev A, which includes the automatic silent transfer on the ATC side under certain conditions, but the pilot still calls between sectors. The objective is to reduce the need of check-in radio calls every time the flight is transferred to a new sector within an ATSU or to another ATSU.Automatic uplink of speed constraints to succeeding aircraft in the cruise phase: the system automatically calculates and uplinks Mach number constraints for aircraft that will fly on the same route over a long period of time to avoid catch-up situations. The system should calculate the speed constraints to minimise overall fuel burn considering equity principles to not systematically penalise aircraft with a lower fuel consumption. Automatic uplink of Mach number or indicated airspeed (IAS) constraints to aircraft descending on the same route to ensure the separation gap be maintained during the descent, thereby reducing the need for intermediate vertical constraints in the descent. Note that many FMS versions do not manage speed constraints when defined as a Mach. A "constant Mach segment" feature exists in most FMS, allowing to fly at a constant Mach in cruise between 2 specified waypoints, but this does not exist for Descent (only IAS constraints are managed However, aircraft with such limitation for flying Mach number constraints with the FMS can still execute such instructions using FCU/MCP Note that there is on-going work under projects ATC-TBO and IARVIS.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5). For elements requiring cross-ATSU-border coordination, the research should validate the case where

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two ATSUs have systems from different vendors.

Highly automated ATC

In this concept ATS B2-equipped flights are never in contact with a human operator via either voice or CPDLC based while the traffic situation remains within a pre-defined scope, using either a general or a selective approach; In both the general and selective approaches, there is no human operator directly monitoring the system actions; when an aircraft is controlled by the system they will be instructed to monitor a frequency, but the flight crew requests should come via CPDLC and will not be directly processed by a human operator unless the ground system requests human supervision (in accordance with level 4 the automation roadmap):

In a general approach, all aircraft in a sector or group of sectors are controlled by the system so long as the scenario remains in its predefined scope, e.g. the defined scope may require that all aircraft in the scenario having a specific equipage and being separated from each other by either 1000 ft (vertically) or XX NM (laterally) and may exclude specific traffic flows. Whenever the pre-defined scope conditions cease to be true for all aircraft, e.g. one non-equipped aircraft entering the sector or two aircraft get closer than 1000 ft or XX NM, then the system will request the human operator to take charge of the whole scenario, i.e. the human operator relieves the ATC system. In a selective approach, the human operator and the ATC system work together within the same sector or group of sectors, so that the ATC system is in charge of controlling the aircraft that fulfil the conditions within a pre-defined scope. This concept builds on the SESAR attention guidance "fade-out algorithm" solution (PJ.10-W2-96 AG), taking it a step further: the selected aircraft are not just faded-out, but completely under the control of the system. When an individual aircraft ceases to fulfil the pre-defined scope conditions, the system will request the human operator to take the individual aircraft under control, while the system continues to control the aircraft that are still in the pre-defined scope.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

ANSP contribution to and use of network trajectory service

This research element covers:

Definition and validation of new updates from ANSPs to NM via FSA. Reception by ANSP systems of NM trajectory and its integration in the trajectory used by local ATFM unit systems and/or the trajectory used by the AMAN.

#### Unconstrained desired trajectory (UDT)

All TBO actors should aim at continuously optimising the trajectory. The objective of the UDT is to provide a means for the completely unconstrained trajectory desired by the AU to always be available as a reference to ATM. This research element covers: The use of the UDT by the local ATFM units to improve the efficiency of the flight in planning and execution. The use of the UDT during the execution of the flight by ATC to facilitate the continuous and precise optimisation of all trajectories. Note that the provision of ATC clearances that are not consistent with a current RAD measure or a LoA with an impact on a downstream ATSU will always require coordination with the relevant actors (cross-border if only one downstream ATSU is affected, or via an ANSP-triggered network impact assessment if the change affects more than one downstream ATSU). If a network impact assessment is required, the ATC system should trigger it automatically.

In addition to supporting continuous optimisation concepts, the UDT is useful for post-operations performance assessment purposes. The development of performance metrics for assessing flight efficiency based on UDT is also in scope.

This is a support feature that does not deliver clearances but supports ATC in the clearance delivery process. Requires participation of NM, ANSPs and FOC.

This element would benefit from integrated validations including the NM and FOC prototypes (covered in WA 1) and the ANSP prototypes (covered in WA 3).

FF-ICE/R2 precursor for the revision of the agreed trajectory in strategic execution

This research element covers the ANSP contribution to the FF-ICE/R2 precursor for the revision of the agreed trajectory in strategic execution:

Coordination between the local ATFM units and NM during the CDM process to agree to the revision (if the process developed by WA 1 project so requires).Once of the CDM process is completed, reception by ANSPs of the revised trajectory.Delivery by ATC systems of the clearance for the revision of a 2D trajectory (if the process developed by WA 1 project so requires).Monitoring of the consistency of the air and ground trajectories for ADS-C equipped aircraft, potentially with a specific process with aircraft with a flight plan that has been revised in execution (e.g. with a version number 2 or more if the flight plan version number is applied).

This element would benefit from integrated validation covering the network aspects (covered in WA 1) and the ANSP aspects (covered in WA

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3). If the clearance is delivered by ATC systems, the validation must include live trials or integrated simulations with airborne prototypes and ATC system prototypes.

Improved management of military flights

The objective of this element is to improve the handling of military missions and to reduce their impact on civilian traffic. This requires the development of ANSP local ATFM platforms to support improved CDM processes based on iOAT and later military FF-ICE flight plan, and the integration in ATC platforms of the advanced military flight plan formats. The development of ATC automation for improving the quality of service to military flights and for reducing the impact of military flights on civilian traffic is also in scope.

Advanced target time of arrival (TTA) coordination for out-of-area departures

The research element addresses the evolution of TTA management process in solution PJ.25-02 "Target Time of Arrival (TTA) management for seamless integration of out-of-area arrival flights", which aims at avoiding many long to medium-haul flights arriving at the same time and having to hold. This may include, for example:

A concept where the departure times would now be sent to the (out-of-area) departure ASP in addition to the FOC, so that the departure ASP can support adherence to the target take-off time.Improvements to the algorithms use for the allocation of TTAs to long-hauls.An increase in the level of automation of the processes.

This element would benefit from integrated validations with WA 1.

Mission Trajectory with dynamic mobile areas (DMA) type 3

The research area covers the development and validation of the application of dynamic and mobile airspace segregation, the dynamic mobile area type 3 concept element of advanced flexible use of airspace (AFUA) as integral part of mission trajectory management processes throughout the trajectory planning and execution phases.

Detailed R&I needs in support of the reduction of the climate impact of aviation:

Network-orchestrated avoidance of eco-sensitive areas

While it is expected that ATM can facilitate voluntary contrail avoidance in low traffic-density situations, in medium or high traffic-density situations it is expected that a coordinated approach will be required. The objective is to develop a concept for the integration of contrail avoidance processes in existing DCB processes, but also addressing when required (e.g., long-haul flights) strategic or tactical contrail avoidance (in the execution phase, via FF-ICE/R2 if strategic or directly with ATC if tactical).

Research should determine the criteria for the declaration of an ECO-area or ECO-spot, defined as a volume of airspace that is considered to be eco-sensitive from the non-CO2 perspective, for example because warming contrails are predicted during a period of time. The prediction can use satellite imagery, ground cameras, LIDAR (see WA 2-1, aircraft as a sensor). The operational concept must consider the uncertainty in the prediction of contrails and its impact on the achievement of the performance objectives. NM would then incorporate this information in its systems to regulate traffic through the eco-area. This could mean to completely close the airspace volume to air traffic or to simply reduce the flow of traffic. The contrail avoidance process needs to be integrated in existing DCB processes, together with other constraints considering the local / network DCB levels. The process will also consider the options for ATC/NM to respond to airline-led (AUs to be encouraged by mandates to minimise climate impact) or for ANSP-lead contrail avoidance.

Research also includes the need for improved weather forecasting/prediction and climate impact assessment.

As it is known that different types of fuel have different impacts on contrail formation, the type of fuel (e.g., particulate matter content of conventional fuels, SAF blend, etc.) of a flight might determine whether or not they are authorized to fly through the eco-area. In this case, a field with the type of fuel may need to be added to the FF-ICE flight plan. Other parameters such as aircraft type and engine type have also impact on non-CO2 impacts, and the FF-ICE flight plan may also to be updated to include the required technical parameters. The incorporation of non-CO2-relevant aspects in the flight plan should be done in an automated way. A process for estimating the fuel blend of each individual flight based on the re-fuel history of the tail number may need to be developed.

Flights that are not authorised to fly through an eco-area will be offered a vertical or horizontal re-route, and/or a delay if the eco-area is expected to go cold in a relatively short time. The re-route and/or delay will be sent as a reply to the filing of the FF-ICE flight plan, together with information on the parameters of the eco-area (location, time, and category (e.g., all traffic forbidden, limited traffic allowed, only specific SAF traffic allowed, etc.). Flights traversing ECO sensitive areas could be assigned a (to be developed) "eco-sensitivity index" and after evaluating trade-offs between reducing the non-CO2 effects and potentially increasing the CO2 effects (fuel burn and flight time) through flight rerouting, a "mitigation index" could be estimated and quantified. Flight planning software may need to be updated to

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incorporate non-CO2 mitigation actions. Research should focus on acting on the highly climate warming areas or flights (individual flights that have a net CO2 + non-CO2) as well as in flows which will require different considerations than individual flights and which are the basis for NM. The transition from the current fuel-based criteria for green trajectory optimization to a holistic assessment that includes both CO2 and non-CO2 environmental impacts should be addressed.

The research element further assesses the roles and responsibilities of various stakeholders throughout the contrail process, from planning to execution, considering how local initiatives can integrate into network management assessments, when and how to integrate them. The development of ATC support tools is also in scope. Note that there is on-going work under projects CONCERTO and CICONIA (i.e., accuracy of the weather/climate prediction models (e.g., ECO area/spot prediction and management of avoidance trajectories on both AUs and ATC sides)) on this topic should be considered.

Automatic queue management and dynamic E-TMA for advanced optimised climb and descent operations and improved arrival and departure operations

Research aims at improving descent and climb profiles in busy airspace, as well as the horizontal flight efficiency of arrivals and departures, while at the same time ensuring better traffic synchronisation, short-term demand capacity balancing (DCB) and separation in TMA/E-TMA environment.

Research may address aspects such as: automatic arrival streaming in systemised airspace, automatic and dynamic distribution of traffic across offload arrival and departure routes at periods of peak demand, leveraging ATS-B2 (via CPDLC messages) in supporting less constrained descents (e.g., by automatically providing speed constraints to aircraft descending on the same route, e.g. following the approach proposed by SESAR project OPTA-IN ), AI-based what-if capabilities, automation of extended ATC planner tasks, etc.

Research shall consider the work performed by SESAR 2020 SESAR solutions PJ.01-W2-08A1, PJ.01-W2-08B1 and PJ.01-W2-08B4 (including recommendations documented in the relevant contextual notes) and demonstrate how the limitations from the previous approach will be addressed).

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Dynamic allocation and uplink of arrival and departure routes considering CO2, noise and local air quality

In contrast to today's one-size-fits-all approach to noise abatement departure procedures (NADP), SIDs and STARs, the future ATM system will dynamically allocate departure and arrival routes to each individual aircraft. This should initially be based on the development of a much larger catalogue of route structures (including SIDs and STARs) compared to what exists today. These route structures can be activated or deactivated depending, for example, on the time of day, for noise control purposes, or depending on traffic demand, so that the use of more complex route structures is avoided during periods of low demand, enabling agile responses to variations of operational conditions in the terminal area such as traffic density, airspace availability or environmental constraints. The dynamic use of RNP route structures will allow trade-offs and optimisation of benefits depending on traffic demand (e.g., improved capacity during peak periods, fuel-efficient operations during off-peaks, reduced noise footprint at night) in the TMA. Research will determine how the allocated routes will be passed on to the aircraft; it is expected that whenever possible this will be in the form of a clearance, but in some cases, it may be necessary to provide the new route as an "EXPECT" instruction for the aircraft to plan against, with the clearance being delivered at a later stage. Uplink of information expected delay or distance to go (DTG) is also under scope.

Arrival Manager (AMAN) system with enhanced functionalities as needed, is expected to support the dynamic assignment of the optimal and most eco-efficient RNP route structures, depending on metrics such as predicted arrival airborne delay.

This research element addresses the end-to-end concept, including cross-border aspects and the uplink of the delivery of the STAR clearance to each aircraft. The target concept is for the clearance to be delivered automatically via CPDLC and is loadable in the FMS with a push-to-load action from the flight crew. The research should also develop the required on-board capabilities to support the crew in his/her decision for proposed trajectory acceptance.

The research element also addresses departure routes too, which can be delivered as part of the departure clearance. If allowable at the aerodrome, the departure route can be updated during the taxi phase because flight-deck automation will allow the use of CPDLC and push-to-load during the taxi phase. Runway management and departure route allocation will incorporate tailored noise abatement departure

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procedures accounting for the individual aircraft climb performance transmitted via the ADS-C EPP. Weather prediction will be used in real time to predict the circulation of emitted particulate matter around the airport and considered as an input to runway, departure, and arrival route allocation to maximise local air quality (LAQ). Note that there is on-going work on TMA route allocation by projects GALAAD and DYN-MARS.

This research element also includes the definition of new NADP concepts and a combined SID and NADP allocation concept that will be based on the optimisation of environmental impact functions that consider potential trade-offs between local capacity, LAQ, noise impacts in the area around the airport and impact on the climate at global level. It is anticipated there will be an initial concept in which the SID scheme is established in advance depending on the MET prediction, for example 4 hours in advance, and published so that AU can consider it in their flight-plan. In the longer term, the allocation will be done on a case-by-case basis and more dynamically (up to just before the aircraft leaves the gate).

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Advanced curved approach and departure operations in the TMA

Using curved flight trajectories in the approach phase of medium/high complexity TMAs based on barometric altitude optimises flight efficiency and lowers gaseous emissions and noise whilst maintaining runway throughput, thanks to a shortened lateral path and more efficient vertical path by using advanced PBN specifications (e.g., advanced RNP and RNP APCH) considering the aircraft performance and capabilities. It also provides a means to comply with increasing environmental constraints at TMAs. The scope covers spacing considerations for curved / RNP APCH and straight-in approaches. Research shall consider the work done by SESAR solution PJ.02-W2-04.1 "advanced curved approach operation in the TMA with the use of barometric altitude".

The scope also covers the development of advanced curved departure operations, which consist of initiating the first turn as soon as departing aircraft cross the departure runway end (DER) based on GNSS navigation (increasing the flexibility in departure procedure design) and using existing airborne capabilities to greatest extent possible. This has a positive impact on gaseous emissions, noise of TMA operations and flight efficiency. Research shall consider the work done by SESAR solution PJ.02-W2-04.2 "advanced curved departure operations in the TMA".

This element may benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Flexible eco-efficient ATC clearances

When specific conditions are met, typically low traffic conditions, ATC may issue flexible clearances. The targeted flexibility may include free lateral or vertical route deviation (without the need to require a new route clearance) for flight optimisation purposes, so that aircraft can, for example, be cleared to cruise between two flight levels or be allowed the freedom to deviate horizontally within a certain area, allowing more effective use of favourable winds. This concept requires the adaptation of the ATC system. This may require support tools for the flight crew to facilitate the request. For flexible eco-efficient clearances to be issued by CPDLC, the ATS B2 standard would need to be modified to include them. In low traffic conditions, voice could be used instead as an interim concept.

This element would benefit from air-ground integrated validation activities integrating the ground prototypes (covered in WA 3) and the airborne prototypes (covered in WA 5).

Dynamic separation minima

This research element extends the dynamic pairwise separation minima for approach and landing to en-route and TMA, based on predictive modelling and ML techniques and enabled by further automation and improved connectivity with the objective of increasing airspace capacity and hence improving flight efficiency. The objective is to develop new geometry-dependent pair-wise separation minima in en-route and TMA. It may address vertical and/or horizontal separation minima and/or a combination of both (e.g., separation must be above XX NM and 500 ft.). The separation minima to be developed include both minimum radar separation (MRS), which aims to keep the risk of collision sufficiently low to meet the target level of safety (TLS), and minimum wake separation (MWS), which aims to keep the risk of wake encounter sufficiently low to meet the TLS and potentially provide safety benefits. The separation to be applied in operations will always be the maximum of the applicable MRS and MWS. The operational improvement will also require combined separation minima and consideration of flight-specific data. Research must consider the safety aspects related to wake vortex. Note there is previous research in the area in project R-WAKE, and that there is a potential dependency between the reduction of vertical separation minima and geometric

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altimetry, covered by WA 5-3. There is ongoing research on geometric altimetry in GREEN GEAR. En-route and TMA digital environmental performance dashboards

The aim is not only to provide visibility of environmental metrics but also to support their progressive integration into the decision-making process at strategic, pre-tactical and tactical levels, including the consideration of trade-offs with other performance indicators. The enhanced environmental performance dashboards are expected to incorporate existing metrics and expand the environmental impact assessment toolbox by developing novel metrics to provide a more complete picture of the impact of aviation on the environment than is possible today. This may address, for example:

Support for the inclusion of environmental criteria (noise, CO2 and non-CO2) for the management of runway use. Development of energybased metrics, which allow the comparison of the impact on different ATM actions using a score that is independent of the propulsion system / fuel type of each of the individual aircraft. This will become an essential metric as the evolution of the fleet mix makes the classic comparison of overall fuel burn or CO2 emissions obsolete. Enhancement of the current optimised descent operations (ODO) / optimised climb operations (OCO) monitoring to include complementary m metrics that capture the inefficiencies caused by early descent (time from top of descent (TOD) to landing, difference between actual and extended projected profile (EPP) TOD, machine learning (ML)-based metrics that provide an energy-based score of the efficiency of the descent, etc.). Monitoring of the inefficiencies caused by aircraft cruising below their optimum flight level. This will require the development of a system to allow the AU to provide the desired flight level from each flight (e.g., through the unconstrained desired trajectory (UDT) or through alternative means). Development of advanced horizontal efficiency metrics that factor out the extra miles (KEA - key performance environment indicator based on actual trajectory) flown when avoiding active military areas that are in use but count as inefficiency the extra miles that are flown around military areas that are not in use. Special attention should be paid to reinforcing coordination between TMA and airport regarding environmental performance, ensuring that environmental performance dashboards make visible trade-offs between different environmental impacts (e.g., fuel, noise in TMA, climate change), and between environmental impacts and other performance indicators (capacity). The information from the environmental dashboards that is relevant to the public and hence the research should include a study on how to best make relevant data available to all European citizens.

#### Dynamic airspace in wider context of advanced DCB and digital INAP

Dynamic airspace in wider context of advanced DCB and digital INAP enables a near real-time configuration of the airspace with human operators and systems teaming up to meet the needs of all airspace users (civil and military) and to manage capacity more efficiently. For certain sub-operational environments, the system will be fully automated and able to handle both nominal and non-nominal situations. The process configuration, which today is designed to minimise complexity for human operators, will become more dynamic and, where applicable, near real-time. Research may consider the integration between dynamic airspace configurations, virtual centre and increased flexibility of ATCO validations. Topics can combine ATS delegation aspects (e.g., inter/intra ANSP and inter/intra providers) including solutions such as increased flexibility of ATCO validations and virtual centre, which are expected to complete TRL6 in project IFAV3, VITACY, iSNAP and ISLAND.

#### Operational use of VHF LEO in European outermost regions

This element covers the development and validation of the operational use of LEO VHF voice and datalink in remote areas, where currently VHF voice and VDLM2 is insufficient. In combination with space-based ADS-B, the availability of this new CNS service will make it possible to upgrade the ATM service, allowing a reduction of separation minima and hence increased capacity and reduced environmental footprint. Note this element develops the operational use of the CNS technologies developed by ongoing SESAR project ECHOES. This element must address the relevant regulatory aspects.

Increased security virtual centres and aeronautical data service providers (ADSP) against cyber-threats

In the context of ADSP and virtual centres, which may utilise private or public clouds for hosting their systems, it becomes essential to design these systems with adaptability to cyber threats in mind.

In anticipation of predicted cyber threats, these systems should be capable of, for example, dynamically reconfiguring their connections, and physically relocating hosting hardware in reaction to cyber-attacks.

Consequently, the development of these systems must prioritize adaptability to cybersecurity threats through specific design requirements. Such systems should be able to perform tasks such as the following:

To identify active threats and threat scenarios in real-time. To predict the potential means of evolution of threat scenarios in real-time. To adapt in response to threat scenarios. To recover to restore full operations. [1] In order to avoid content duplication, wake retrieval energy (WER) description is provided in the topic WA5-3, which is addressing the development action IR-5-04

[2] https://digital-strategy.ec.europa.eu/en/library/recommendation-coordinated-implementation-roadmap-transition-post-quantum-

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cryptography.

[3] In the cross-ATSU-border case, for the downstream clearance to be uplinked directly by the downstream ATSU, the aircraft would have to have two active CPDLC connections (one to the current ATSU and another one to the downstream ATSU). The SESAR concept does not consider the double active connection option.

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