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ANNEX

ANNEX

to the

Commission Implementing Decision

amending Implementing Decision C(2023) 1862 on the financing of the Digital Europe Programme and the adoption of the work programme for 2023-2024

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Annex I to Implementing Decision C (2023) 1862 is amended as follows:

(1)   In Section 1, subsection 1.1 is replaced by the following:

1.1 Destination Earth

The main components of the Destination Earth (DestinE) system, developed under the WP 2021/22, are:

1. Core Service Platform: a user-friendly entry point for DestinE users. The platform will provide evidence-based decision-making tools, applications and services, based on an open, flexible, and secure cloud-based computing system. It will coordinate data, cloud and HPC infrastructures and provide access to an increasing number of Digital Twins as they become gradually available via related European Commission and/or national efforts. The platform will make available relevant AI tools, extreme-scale data analytics and Earth-system monitoring, simulation and prediction capabilities. At the same time, it will provide dedicated resources to DestinE users, allowing them to customise the platform, integrate their own data and develop their own applications. The procurement of the platform and the associated DestinE service operations is the responsibility of the European Space Agency (ESA).

2. The Data Lake is the consolidation of pre-existing European data holdings from Copernicus, the data holdings of the three DestinE implementing entities (ESA, EUMETSAT and ECMWF) and other sources, like the Internet of Things (IoT) and socio-economic data. It will also integrate the new data that will originate from the Digital Twins, creating a coherent and self-standing DestinE data space. DestinE is part of the Green Deal data space and as such, part of the overall data spaces constellation, enabling a cross-fertilisation among the various fields and domains for the various data spaces. It will provide access to the data needed for the Digital Twins and the Core Service Platform operations and it will host user data, shared with the DestinE user community while supporting near-data processing to maximize performance and service scalability. The Data Lake will be operated by the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT).

3. The Digital Twins – digital replicas of the highly complex Earth systems – are based on a seamless fusion of real-time observations and high-resolution predictive modelling in the thematic areas, starting from the Weather-induced and Geophysical Extremes and climate change adaptation. The long-term goal is to integrate additional digital twins for a comprehensive digital twin of the Earth. The digital twins of DestinE will provide users with tailored access to high-quality knowledge for user-specific scenario development for decision support. The first two Digital Twins (Climate change adaptation, Extreme Events and Geohazards) are developed by the European Centre for Medium-Range Weather Forecasts (ECMWF).

Under this WP, the DestinE initiative will continue being implemented through the Contribution agreements with the three implementing entities (ESA, ECMWF, EUMETSAT). A federated access to the EuroHPC Joint Undertaking infrastructure is planned for the period covered by the WP 2023/24, as the respective EuroHPC JU systems become gradually available.

The description below therefore covers the overall period of the WP 2023/24.

Objective

The objective is to continue implementing the DestinE initiative in seamless continuity with the work undertaken under the WP 2021/22, as provided for under the Contribution Agreements signed with the implementing entities (ESA, ECMWF and EUMETSAT). The aim under WP 23/24 is to continue the service provision, upgrade the whole system framework, provide additional services to more users, expand into further priority areas and topics of interest as well as start integrating new Digital Twins. In the meantime, any relevant input from the DestinE Strategic Advisory Board will be considered, as appropriate.

Scope

Under the WP 2023/24, the DestinE initiative will be further implemented putting emphasis on the system activity to reinforce all aspects of the deployed solutions, from data flow to integration and federation of external services as well as to the deployment of an additional range of services, tools and applications (new, enhanced versions of all main components' services). These include:

- Further development and evolution of the Core Service Platform and its full integration with the Data Lake and the Digital Twins. An additional range of services, tools and applications will become available. The activities for interoperability and technical alignment with new Digital Twins (e.g. the Digital Twin Ocean) will start. Service provision will expand to more user groups.

- Expansion of the Data Lake by including additional data holdings and data sources from new areas and fields and optimisation of the Data Lake Federation, including network and connectivity aspects. A Data Lake service portfolio will be made available to the Digital Twins and the Core Service Platform.

- Upgrade and consolidation of the first two Digital Twins (weather-induced and geophysical extremes and climate change adaptation) and performance optimisation of the Digital Twin Engine, including the building of interactive elements and transversal features, allowing the service and support of interdisciplinary Digital Twins. Integration into both Digital Twins of cutting edge AI technology, in particular for constraining uncertainty of generated predictions and for increasing computational efficiency, and towards developing a Generative AI foundation model for Destination Earth. This particular activity will contribute to increasing the European expertise to operate large scale AI applications on the EuroHPC supercomputers. Benefiting from Destination Earth's scope spanning many scientific domains, the development of a Generative AI model will also enable synergies and reuse of components, such as tooling and models, in other domains, thus supporting the development of other AI communities.Piloting the interoperability between DestinE and the Digital Twin Ocean (DTO)[1] a main initiative under the EU Mission Restore our Ocean and Waters by 2030[2] and possible, other, Digital Twins, depending on their level of maturity and DestinE compliance.

- **A number of AI major activities implemented by ECMWF for the deployment of workflows for the components of an ML model for the Earth system, applying state-of-the-art ML/AI techniques to quantify uncertainties in the Digital Twin simulations and enhance the interactivity of the Digital Twins.**

- **Further demonstrating through selected use cases the added-value of the digital twins for additional sectors and use cases demonstrating and (co-) developing value of novel Digital Twin and Digital Twin Engine capabilities, namely by having novel use cases focusing on user uptake**

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[1] EDITO-Infra (HORIZON-MISS-2021-OCEAN-IBA-01)

[2] https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters_en

- **of Climate Digital Twin and Weather-induced Extreme events Digital Twin in areas not yet covered.**

- **Increase of operational resources to better serve user needs in support of the Entrusted Tasks related to the DestinE Digital Twin Engine, the Weather-induced Extreme events Digital Twin and the Climate Change Adaptation Digital Twin, through tailored support for operationalisation of Digital Twins, including support for interactive user driven data analysis.**

- **Activities supporting the onboarding of relevant Horizon Europe projects' outcomes.**

- **Dedicated actions to evolve use cases to long-term sustainable services.**

The WP 2023/24 continues the focus on the user interactivity aspects and on the user interaction with the Destination Earth simulation capabilities (e.g., on-demand Digital Twin production piloted from the core platform, enhanced analysis capabilities as part of the Digital Twin Engine). In addition, it focuses on user feedback collection, and the definition and implementation of related complementary operational services.

New use cases and user services identification will take place, supported by the respective requirements elicitation and implementation planning.

Additional activities that may be carried out include:

- Piloting activities related to the federation of Member State relevant infrastructures and the integration of Member State initiatives on Digital Twins and development of a selection of international partnerships and synergies.

- Application of a jointly agreed Quality Mapping framework (or similar).

- Integration of Destination Earth with SIMPL[3].

Synergies with relevant Horizon Europe areas are already in place, as a number of respective Horizon Europe actions are already running, facilitating the development of new Digital Twins, while new topics are planned for that purpose in the next Horizon Europe Work Programme. Also, there are already well articulated synergies defined with the Copernicus programme and horizontal teams among the respective Commission Services have already been formed for that purpose. The entrusted entities of DestinE and Copernicus, and the respective teams of DG CNECT and DG DEFIS, systematically work together in order to ensure programmatic, technical and operational alignment (notably in terms of service portfolios, data access and integrated data management), as well as to avoid overlaps and double effort as Copernicus will serve as a major data source of DestinE.

Finally, the Commission collaborates with ESA, with support from the other implementing entities ECWMF and EUMETSAT, to ensure maximum alignment between the ESA Digital Twin Earth Programme adopted by ESA in November 2022 and DestinE.

Deliverables

Core Platform (ESA):

- Deployment of the Version 2 of the Core Platform Services

- On-demand Digital Twin production from the core platform and integration of Digital Twin commanding interfaces for on-demand and interactive simulations

- Additional range of services, tools and applications to become available

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[3] Simpl: cloud-to-edge federations and data spaces made simple, https://digital-strategy.ec.europa.eu/en/news/simpl-cloud-edge-federations-and-data-spaces-made-simple

- **A selection and onboarding framework for new applications and services, transforming existing use cases to long-term, sustainable, services.**

- **Development of new dedicated services on the platform.**

- **Interoperability with "Minimum Interoperability Mechanisms (MiMS)" compatible platforms or urban digital twins, enabling ready to use MiMs interfaces for interoperability between DestinE data and services and MiMS-compatible urban digital twins.**

Data Lake (EUMETSAT):

- Deployment of the Version 2 of the Data Lake Services

- Additional data holdings and data sources from new areas and fields to become part of the federation

- Optimisation of the Data Lake federation, including network and connectivity aspects, including the complete entry in operation of optimised file transfers

- **Dedicated actions for ML-based data transformation activities, ensuring precision and digital fidelity in data.**

- **New use cases under the theme: "Track and classify Mesoscale Convective Systems ("storms")", to improve model representation and forecast.**

Digital Twin Engine and the first two Digital Twins (ECMWF):

- Deployment of the Version 2 of the Digital Twin engine and the first Digital Twins' Services:

- Enhanced analysis capabilities as part of the Digital Twin Engine: On-demand and interactive workflows deployment, performance optimisation, near-real time simulations

- Integration AI-based solution to constrain uncertainty of generated predictions and to increase computational efficiency,

- Activity towards development of a DestinE AI foundation model for weather/climate

- DT Engine integrating HPC capabilities and optimizing HPC resource allocation

- Version 2 of the Extremes Digital Twin: The system will start integrating the required capabilities for geophysical hazards (earthquakes, volcanic eruptions and tsunamis, geomagnetic storms) and evolve the initial applications towards longer time scales and an enhanced use of ensemble methods for uncertainty quantification. The supporting software infrastructures will be scaled up and implemented across platforms.

- Version 2 of Climate Change Adaptation Digital Twin: The system will start integrating advanced systems for initialisation (data assimilation), ensemble generation and the definition of short-term forcing (ENSO, volcanic eruptions) at unprecedented resolutions will be implemented, including multi-decadal prediction systems and enhanced operational prediction capabilities.

- The links and synergies to the existing products and services of the Copernicus Emergency Management Service and the Copernicus Climate Change Service will be further explored.

- For both, the weather-induced and the climate change adaptation twin, regions and communities involved in the Mission on Adaptation to Climate Change could provide, in coordination with the three DestinE implementing entities, additional use cases, data and testbeds for the development and implementation of these twins.

- **Develop and deploy open-source workflows for ML Earth-system components towards a European foundation model.**

- **Development of ML demonstrators in high-impact domains, such as tropical cyclones, agriculture, city health, renewable energy, in a changing climate.**

- **Enhance the data handling and processing pipelines of the Digital Twin Engine to support the development, training, data-feed and execution of ML/AI models on the EuroHPC supercomputers within the Digital Twins framework.**

- **Develop a climate emulator to support exploring "what-if" scenarios.**

- **Leverage LLMs to provide enhanced interactivity of the Digital Twins.**

- **Prototype a forecast-in-a-box concept to provide enhanced Digital Twin interactivity**

- **Pioneer pilot use cases for supporting the EU-US collaboration in the context of AI4PublicGood.**

- **Provide training on generative-AI capabilities.**

- **Tailored support for operationalisation of Digital Twins with access to Digital Twin Engine services, including support for interactive user driven data analysis.**

- **Establish ethical guidelines, quality monitoring & management, and policy recommendations for generative-AI and its associated data sources.**

Type of action	Contribution Agreement
Indicative budget	EUR 111.3 million[4]
Indicative time	2024
Indicative duration of the action	24 months
Implementation	Indirect management with ESA, ECMWF, EUMETSAT
Type of beneficiaries	The implementing entities (ESA, ECMWF and EUMETSAT).
Eligibility criteria	In line with the general conditions laid down in Article 18(1) of the Regulation (EU) 2021/694, participation in the implementation of the DestinE is open to the legal entities established in the Member States and Associated Countries as well as to international organisations of European interest and other legal entities created under Union law. These eligibility criteria shall apply to candidates and tenderers for procurement contracts to be concluded by the implementing entities for the implementation of their respective tasks.

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[4]EUR 25.2 million out of this budget is for Phase III activities. Overall budget for Phase II activities is 198.4 million.

(2)   In Section 1, the following subsection 1.2 is added:

1.2 AI-Optimised Supercomputers for AI Factories

The AI Factories aim to bolster the leadership of European AI startups and stimulate the emergence of competitive AI ecosystems in the Union. These open and dynamic ecosystems will be formed around the public network of Europe's world-leading EuroHPC supercomputers and will bring together key material and human resources needed for the development of large generative AI models and applications: AI-optimised supercomputers, associated data centres, programming and training facilities, and human capital to use these resources effectively – from supercomputing and AI experts, through data specialists, researchers, startups and end users.

Objective

This action aims to further Europe's AI capabilities by selecting hosting entities for new AI-optimised EuroHPC supercomputers or existing hosting entities to upgrade existing EuroHPC supercomputers with AI capabilities. The initiative will enable the deployment of cutting-edge AI optimised computing infrastructures across Europe, ensuring that AI researchers, startups, and industry have access to state-of-the-art computing power, data resources, and expertise.

An AI-optimised supercomputer means a supercomputer that is primarily designed for training large scale, general-purpose artificial intelligence models and emerging artificial intelligence applications.

Through this action, the EuroHPC Joint Undertaking (JU) will establish long-term partnerships and sign hosting agreements with selected hosting entities, enabling:

- The procurement, integration, and operation of new AI-optimised EuroHPC supercomputers or the upgrade of existing EuroHPC supercomputers with AI capabilities.

This action will strengthen Europe's digital sovereignty, accelerate AI-driven innovation, and provide computing capacity for strategic sectors such as healthcare, climate modelling, cybersecurity, finance, energy or manufacturing.

Scope

The action will support the selection and funding of hosting entities through a competitive process, ensuring that the best candidates are chosen for AI-optimised supercomputing investments. The EuroHPC JU will evaluate proposals based on technical excellence, capabilities and experience of hosting entities to operate AI optimised supercomputers and their impact on Europe's AI ecosystem.

The action comprises mainly the following:

Acquisition or upgrade of AI-optimised EuroHPC supercomputer(s). This comprises the selection of i) new hosting entities that would acquire new AI-optimised supercomputers, or ii) existing hosting entities that would upgrade their current EuroHPC systems with AI-optimised features whilst ensuring energy efficiency and sustainability.

In accordance with Articles 9 and 12a of the EuroHPC Regulation, an AI Optimised EuroHPC Supercomputers shall be located in a Participating State of the EuroHPC that is an EU Member State.

Deliverables

Fully operational AI optimised supercomputing systems that build on the network of the leading EuroHPC supercomputers and that are accessible to AI startups, SMEs, industry, and researchers, serving the wider AI ecosystem for providing them with computing capacity required for training and fine-tuning AI models as well as inferencing at scale.

Type of action	Contribution Agreement
Indicative budget	EUR 20 million
Indicative call planning	To be defined by EuroHPC JU Governing Board
Indicative duration of the action	To be defined by EuroHPC JU Governing Board
Implementation	EuroHPC JU
Type of Beneficiaries	Hosting Entities located in a Participating State of the EuroHPC that is an EU Member State.

(3) In Section 3, subsection 3.2 is replaced by the following:

3.2 Support to Incident and Vulnerability Response and Reporting and implementation of the Cyber Resilience Act

Objective

This mechanism aims to complement and not duplicate efforts by Member States and those at Union level to increase the level of protection and resilience to cyber threats, by assisting Member States in their efforts to improve the capability to respond to cyber threats, incidents and vulnerabilities by providing them with knowledge and expertise, including by creating the new Cyber Resilience Act reporting platform. **Furthermore, this mechanism aims to ensure adequate support for the implementation of the Cyber Resilience Act.**

Scope

The support of incident response (ex-post) shall include the following activities: Gradual set-up and operation of an EU-level cyber reserve with services from trusted private providers to provide relevant services to mitigate the impact of serious incidents. Such services would support immediate recovery and/or restore the functioning of essential services, as well as identification and preservation of digital evidence. Actions to set up the cyber reserve may include:

• Technical assistance with Incident management.

• Information Security Incident Analysis and Crisis Communications as a retainer type of service.

• Artefact and Forensic Evidence collection and analysis preserving the chain of custody.

• Information Security Incident Coordination.

• Comprehensive reporting including scope, recommendations, remediation and findings.

• Coordination with preparedness support services funded under the DEP cybersecurity programme, and other relevant activities on cybersecurity incident preparedness.

This support will be complemented by strengthening of capabilities to develop up-to-date and strategic-level situation analysis, risk scenarios and overviews of the threat landscape through ENISA's contribution in the Cyber Analysis and Situation Centre.

The implementation of support for incident support will be without prejudice to Cyber Solidarity Act .

The incident and vulnerability response support and reporting shall include also actions related to the establishment, management, and maintenance of day-to-day operations of the Cyber Resilience Act single reporting platform by ENISA.

Furthermore, support to the implementation of the Cyber Resilience Act shall include also actions related to the following:

- **development and assessment of technical specifications and standards,**
- **interplay with European Cybersecurity Certification schemes (adopted pursuant to the Cybersecurity Act),**
- **technical support in the development of guidance or other implementation measures concerning the Cyber Resilience Act.**

Deliverables

- EU-level cyber reserve with services from trusted private providers for incident response
- Contribution to the Cyber Analysis and Situation Centre.
- The establishment of the Cyber Resilience Act single reporting platform.
- Management, and maintenance of day-to-day operations of the of the Cyber Resilience Act single reporting platform.
- **Contribution to the development or assessment of technical specifications and standards for compliance with the Cyber Resilience Act.**
- **Technical advice on guidance or implementing and delegated acts, including on interplay with European Cybersecurity Certification schemes (adopted pursuant to the Cybersecurity Act).**
- **Development and monitoring of pilot projects in support of CRA implementation, including reporting results.**

Type of action	Contribution Agreement
Indicative Budget	EUR 15.25 million
Indicative time	2024
Indicative duration of the action	2 years
Implementation	ENISA
Type of Beneficiaries	Not applicable
Security	Action restricted on the basis of Article 12(5) of the Regulation (EU) 2021/694.

All actions under this topic are aimed at services intended specifically for protection against criminal and/or politically motivated cyber threats, including in particular supply-chain attacks. The participation of non-EU entities could lead to highly sensitive information about security risks and incidents being subject to legislation that obliges the non-EU parties to provide this information to

non-EU governments. Also, non-EU participants could be more susceptible to pressure from non-EU governments to divulge such information.

In order to protect the essential security interests of the Union, the implementation actions under this topic should depend on legal entities (e.g., providers) established or deemed to be established in Member States and controlled by Member States or by nationals of Member States.

Participation to the calls funded under this topic will therefore be subject to the provisions of Article 12(5) of the Regulation (EU) 2021/694. Calls for proposals and calls for tenders shall be restricted to legal entities established or deemed to be established in Member States and controlled by Member States or by nationals of Member States. EEA EFTA countries are fully associated to the Digital Europe Programme and benefit from a status equivalent to that of the Member States.

(4)   In Section 6, subsection 6.4, to the paragraph '3. Other' the following bullet point is added:

- Support for the establishment and operation of the AI Act Service Desk.