EuroHPC JOINT UNDERTAKING

DECISION OF THE GOVERNING BOARD OF THE EuroHPC JOINT UNDERTAKING No 41/2022

Amending the Joint Undertaking's Work Plan and Budget for the year 2022

(Work Programme and Budget Amendment no. 5)

THE GOVERNING BOARD OF THE EUROHPC JOINT UNDERTAKING,

Having regard to Council Regulation (EU) 2021/1173 of 13 July 2021 on establishing the European High Performance Computing Joint Undertaking and repealing Regulation (EU) 2018/1488[1], (hereinafter, "the Regulation"),

Having regard to the Statutes of the European High Performance Computing Joint Undertaking annexed to the Regulation (thereinafter "Statutes") and in particular to Articles 1(o), 7(5)(b), 9(4)(b) and (c) and 18 of thereof,

Having regard to Decision of the Governing Board of the EuroHPC Joint Undertaking No 3/2020, approving the Financial Rules of the EuroHPC Joint Undertaking[2],

Having regard to Decision of the Governing Board of the EuroHPC Joint Undertaking No 33/2022 of 25 November 2022, adopting the amended Joint Undertaking's Work Plan and Budget for the year 2022 (Amendment no.4)

WHEREAS

(1) Governing Board Decision No 33/2022 of 25 November 2022 adopted the amended Joint Undertaking's Work Plan and Budget for the year 2022

(2) The Statutes of the EuroHPC JU confer on the Governing Board the powers to adopt the annual work plan and its annual budget including the staff establishment plan.

(3) The annual Work Plan and Budget for the year 2022 needs to be amended to change the type of action of the call "Large-scale European initiative for high-end processors and/or accelerators for High Performance Computing (HPC) based on RISC-V software and

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[1] OJ L 256, 19.7.2021, p. 3–51

[2] Readopted by Decision of the Governing Board of the EuroHPC Joint Undertaking No 17/2021, approving the re-adoption of Governing Board Decisions adopted under the framework of Regulation (EU) 2018/1488 and its updated Rules of Procedure in the view of Regulation (EU) 2021/1173

hardware ecosystem" from our Research and Innovation action to a Framework Partnership Agreement.

(4) The Executive Director of the EuroHPC Joint Undertaking submitted the fifth amended work plan to the Governing Board,

(5) In the interest of legal certainty and clarity, an amended annual Work Plan and Budget of the EuroHPC Joint Undertaking for the year 2022 should be adopted by the Governing Board

HAS ADOPTED THIS DECISION:

Article 1

The fifth amended annual Work Plan and Budget of the EuroHPC Joint Undertaking for the year 2022 annexed to this decision is adopted.

Article 2

The Executive Director shall make the amended Annual Work Plan and Budget 2022 publicly available on the website of the EuroHPC Joint Undertaking.

Article 3

This Decision shall enter into force on the date of its adoption.

Done at Luxembourg, on 5 December 2022.

For the Governing Board

[e-signed]

Herbert Zeisel

The Chair

Annex: European High Performance Computing Joint Undertaking Amended Annual Work Plan and Budget 2022

WORK PLAN and BUDGET

EuroHPC JOINT UNDERTAKING (JU)

2022

In accordance with the Statutes of the EuroHPC JU annexed to Council Regulation (EU) 2021/1173 and with the Financial Rules of the EuroHPC JU.

The annual work plan will be made publicly available after its adoption by the Governing Board.

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ANNUAL WORK PLAN YEAR 2022

A) INTRODUCTION

The EuroHPC Joint Undertaking (hereinafter "EuroHPC JU"), will contribute to the ambition of value creation in the Union with the overall mission to develop, deploy, extend and maintain in the Union an integrated world class supercomputing and quantum computing infrastructure and to develop and support a highly competitive and innovative High Performance Computing (HPC) ecosystem, extreme scale, power-efficient and highly resilient HPC and data technologies.

In July 2021, Council Regulation 2021/1173 (EuroHPC JU Regulation) was adopted, repealing Council Regulation (EU) 2018/1488, and provides the basis of the Work Plan of the Joint Undertaking in 2022.

The Annual Work Plan 2022 contains the actions to be implemented in 2022, including the Calls to be launched in 2022.

For all activities implemented by the EuroHPC JU that are funded from the Horizon Europe budget, the Governing Board may decide to limit in the calls for proposals the eligibility of participants according to Horizon Europe Article 22(5).

For all activities implemented by the EuroHPC JU that are funded from the Digital Europe budget, the Governing Board may decide to limit in the calls for proposals or procurements the eligibility of participants according to Digital Europe Articles 12(6) and 18(4).

For all activities implemented by the EuroHPC JU that are funded from the Connecting Europe Facility budget, the Governing Board may decide to limit in the calls for proposals or procurements the eligibility of participants according to Connecting Europe Facility Article 11(4).

B) OPERATIONS

INFRASTRUCTURE

- **Summary of activities:**

The key objective of the EuroHPC JU is to further deploy and provide access in the Union to a world leading service and data infrastructure with high-end supercomputers which are indispensable to run the most demanding and strategic applications, such as climate change, personalised medicine etc. This action builds on the previous infrastructure activities undertaken by the EuroHPC JU in 2020/2021.

In 2022, the JU will organise:

- Procurement of the 1st high-end (exascale) supercomputer based on the outcome of the call for expression of interest launched in 2021
- Procurement of a number of midrange supercomputers based on the outcome of the call for expression of interest launched in 2021

Furthermore, the JU will facilitate a discussion in the Governing Board to agree on the strategy for the acquisition, including upgrades, of EuroHPC supercomputers between 2022 and 2027. In particular, it will launch the following EuroHPC infrastructure activities:

- A second call for expression of interest for the acquisition and operation of a second exascale supercomputer to be procured in 2023.
- A second call for expression of interest for the acquisition and operation of midrange supercomputers to be procured in 2023.
- A call for the expression of interest for Hosting Entities intending to upgrade EuroHPC supercomputers.

High-end (Exascale) HPCs

- **Procurement for the acquisition and operation of the <u>first</u> EuroHPC High-End (Exascale) supercomputer**

As already indicated in Work Programme 2021, EuroHPC JU will launch the procurement for the acquisition and operation of the first EuroHPC High-End (Exascale) supercomputer. This supercomputer will be hosted in the Hosting Entity selected in the 2021 Call for Expression of Interest. The supercomputer should strive to incorporate to the maximum extent competitive European technology.

Pursuant to Article 10 of the EuroHPC JU Regulation, the EuroHPC JU will be the owner of this supercomputer. The Union's contribution from Digital Europe Programme (DEP) funds should cover up to 50% of the acquisition costs plus up to 50% of the operating costs of the supercomputer. The EuroHPC JU estimates that an EU contribution of up to EUR 250 million and an equivalent EUR 250 million MS contribution would allow for the acquisition and operation of such supercomputer. The total indicative budget for the topic is EUR 500 million.

The Governing Board may decide, if duly justified for security reasons, to condition the participation of suppliers in the acquisition of the high-end supercomputers in accordance with Article 12(6) of Regulation (EU) 2021/694 or to limit the participation of suppliers for security reasons or actions directly related to the Union's strategic autonomy, in accordance with Article 18(4) of that Regulation.

- **Call for expression of interest for the acquisition and operation of the SECOND EuroHPC High-End (Exascale) supercomputer.**

In line with the Digital Europe Programme, EuroHPC-JU will launch a call for expression of interest to identify a hosting entity for the procurement of a second Exascale supercomputer in 2022 (this will be covered in the budget 2023).

The evaluation of applications received will take place, with the support of independent external experts. The hosting entities will be selected by the Governing Board of the Joint Undertaking following the call for expression of interest.

This supercomputer will be hosted in a national Supercomputing Centre (as a hosting entity or as a support to the hosting entity, depending on the national organization) already established in a Member State that is a Participating State of the JU. The launch of the procurement of the supercomputer is foreseen for

2023. The procurement should strive to incorporate the maximum extent available European technology and, ensure complementarity with the first EuroHPC High End (exascale) system to be procured, to ensure diverse underlying system architectures and/or technologies and at achieving the optimal portfolio of exascale systems in order to offer European users with the widest variety of solutions. In light of this, the supercomputer will be operational in 2025.

Pursuant to Article 10 of the Regulation 2021/1173, the EuroHPC JU will be the owner of this supercomputer. The Union's contribution should cover up to 50% of the acquisition costs plus up to 50% of the operating costs of the supercomputer. The operation of the supercomputer will be entrusted to the selected hosting entity. The EuroHPC JU estimates that an EU contribution of up to EUR 300 million and an equivalent of up to EUR 300 million MS contribution would allow for the acquisition and operation of such supercomputer. The total indicative budget for the topic is EUR 600 million.

The Specific Conditions of this Procurement will be defined in Work Programme 2023. The Governing Board has decided that for duly justified for security reasons, to condition the participation of suppliers in the acquisition of the high-end supercomputers in accordance with Article 12(6) of Regulation (EU) 2021/694 and to limit the participation of suppliers for security reasons or actions directly related to the Union's strategic autonomy, in accordance with Article 18(4) of that Regulation. Applications to the call for expression of interest should therefore provide a first indication on whether the applicant would consider conditioning or limiting the participation of suppliers for security reasons and/or reasons related to the Union's strategic autonomy.

SPECIFIC CONDITIONS: CALL FOR EXPRESSION OF INTEREST FOR THE ACQUISITION AND OPERATION OF THE SECOND EUROHPC HIGH-END (EXASCALE) SUPERCOMPUTER. (CFEI 2022; PROCUREMENT 2023)	
Expected EuroHPC JU contribution for 2nd high-end (exascale) supercomputer	The EuroHPC JU estimates that an EU contribution of up to EUR 300 million and an equivalent of up to EUR 300 million MS contribution would allow for the acquisition and operation of this supercomputer. As the procurement will only take place in 2023, this amount will be appear in the Work Programme and Budget 2023.
Indicative budget	The total indicative budget for the topic is EUR 600 million.
Type of Action Eligibility conditions	Call for expression of interest The eligibility conditions are those established in the EuroHPC JU Council Regulation (EU) 2021/1173. The Governing Board has decided, that for duly justified for security reasons, to condition the participation of suppliers in the acquisition of the high-end supercomputers in

	accordance with Article 12(6) of Regulation (EU) 2021/694 and to limit the participation of suppliers for security reasons or actions directly related to the Union's strategic autonomy, in accordance with Article 18(4) of that Regulation. Applications to the call for expression of interest should therefore provide a first indication on whether the applicant would consider conditioning or limiting the participation of suppliers for security reasons and/or reasons related to the Union's strategic autonomy.

- **Mid-Range Supercomputer procurements**

These supercomputers will be hosted in national Supercomputing Centres selected in the 2021 Call for Expression of Interest (as a hosting entity or as a support to the hosting entity, depending on the national organization) already established in Member States that are Participating States of the Joint Undertaking. The supercomputers should strive to incorporate to the maximum extent available European technology and a minimum of 15 Petaflops computing performance is expected for each installed supercomputer. The Governing Board may decide if duly justified for security reasons, to limit in the calls the eligibility of participants according to Horizon Europe (EU) 2021/695 Article 22(5).

The EuroHPC JU estimates that an EU contribution of between EUR 7 million and EUR 35 million matched by a MS contribution of between EUR 13 million and EUR 65 million per supercomputer would allow for the acquisition and operation of several mid-range supercomputers of various performance levels. The total indicative budget for the EU contributions to the topic is EUR 119 million (foreseen in budget 2021).

- **SECOND call for expression of interest for the acquisition and operation of mid-range supercomputers.**

The EuroHPC JU will initiate a second Call for Expression of Interest for hosting mid-range supercomputers. With the support of independent external experts, the hosting entities will be selected by the Governing Board of the Joint Undertaking following the call for expression of interest.

These supercomputers will be hosted in national Supercomputing Centres (as a hosting entity or as a support to the hosting entity, depending on the national organization) already established in Member States that are a Participating State of the Joint Undertaking. The procurement of these supercomputers is foreseen for 2023. The supercomputers should strive to incorporate to the maximum extent available European technology and a minimum of 15 Petaflops computing performance is expected for each installed supercomputer.

The EuroHPC JU and the Participation States will procure jointly the mid-range supercomputers. Pursuant to Article 13 of the EuroHPC Regulation, the EuroHPC JU will be the co-owner of these supercomputers it will acquire. The Union's contribution from DEP funds should cover up to 35% of the acquisition costs, plus up to 35% of the operating costs of these supercomputers.

The eligibility conditions are those established in the EuroHPC JU Regulation. The Governing Board may decide in the Work Programme, if duly justified for security reasons, to condition the participation of suppliers in the acquisition of the high-end supercomputers in accordance with Article 12(6) of Regulation (EU) 2021/694 or to limit the participation of suppliers for security reasons or actions directly related to the Union's strategic autonomy, in accordance with Article 18(4) of that Regulation. Applications to the call for expression of interest should therefore provide a first indication if the hosting entity would consider conditioning or limiting the participation of suppliers for security reasons and/or reasons related to the Union's strategic autonomy.

SPECIFIC CONDITIONS FOR THE SECOND CALL FOR EXPRESSION OF INTEREST FOR THE ACQUISITION AND OPERATION OF MID-RANGE SUPERCOMPUTERS (CFEI 2022; PROCUREMENT 2023)	
Expected EuroHPC JU contribution per project	The EuroHPC JU estimates that an EU contribution of between EUR 7 million and EUR 35 million matched by a MS contribution of between EUR 13 million and EUR 65 million per supercomputer would allow for the acquisition and operation of several mid-range supercomputers of various performance levels
Indicative budget	The total indicative budget for the EU contributions to the topic is up to EUR 48 million.
Type of Action	Call for expression of interest
Eligibility conditions	The eligibility conditions are those established in the EuroHPC JU Council Regulation (EU) 2021/1173.

- **Access and allocation of EuroHPC computing resources and services**

This Call was launched, but due to lack of response by any qualified candidates, it was cancelled by Executive Director Decision 8/2022

Scope: Access to a world-class pan-European High Performance Computing (HPC) and quantum computing infrastructure and to provide state-of-the-art services accessible by users independently of their location, by pooling, integrating and rationalising HPC resources at EU level.

The JU intends to procure international peer review process services to ensure open, fair, and unbiased access to the recently acquired petascale and pre-exascale Euro HPC supercomputers.

Considering the lack of competition existing in the market and in order for the access services to be operational in January 2022, the service will be procured by means of a negotiated procedure without prior publication of a contract notice as provided prior in Points 11.1 (b) (C)11.4 of Annex attached to the Financial Regulation. The contract will be signed for the time strictly necessary (i.e. two years) to allow continuity and appropriate provision of the service.

To procure these access services, the Joint Undertaking will use a negotiation procedure without publication of a contract notice for the service to be provide by Partnership for Advanced Computing in Europe (PRACE).

This process is justifiable as it is a procedure where applicable in cases where there is lack of competition or if there is urgency. For reference purposes, the conditions are set out below:

Lack of competition:

- When the service can only be provided by a single economic operator as competition is absent for technical reasons.
- Should be proved that there is no reasonable alternative and that the absence of competition is not the result of an artificial narrowing down of the parameters when defining the procurement.
  Urgency:
    o When strictly necessary, for reasons of extreme urgency.
    o Brought about by unforeseeable events.
    o It is impossible to comply with the time limits provided for other procurement procedures (37 days in the case of open procedure)
    o Justification of such extreme urgency is not attributable to the contracting authority.

The Joint Undertaking is not aware of any provider besides PRACE that have the required pan-European network of experts and committee structures ready to go (competition absent for technical reasons). Furthermore, the service must be in place in January 2022 which is not possible through an open procurement procedure (urgency).

SPECIFIC CONDITIONS: ACCESS AND ALLOCATION OF EUROHPC COMPUTING RESOURCES AND SERVICES PROCUREMENT	
Expected EuroHPC JU contribution for the procurement	The EuroHPC JU estimates that an EU contribution of up to EUR 5 million would allow these outcomes to be addressed appropriately. Only one proposal will be retained. The expected duration of this action is 2 years.

Indicative budget	The total indicative budget for the topic is EUR 5 million.
Type of Action	Procurement
Eligibility conditions	The conditions will be described in the Tender Document.

Upgrading EuroHPC supercomputers

EuroHPC JU will launch a call for Expression of Interest in April 2022 for Hosting Entities who wish to upgrade EuroHPC supercomputers owned or co-owned by the JU. According to recital 37 of EuroHPC JU Regulation, *the JU 'should seize the opportunity to upgrade the supercomputers it owns, where appropriate. Thus, the upgrades should lead to an extension of the supercomputers' lifetime, increase the operational performance, and provide new functionalities to address the evolution of user needs. For the purpose of upgrading its supercomputers, the Joint Undertaking should be able to launch a call for expressions of interest as part of the infrastructure pillar. The calls for expression of interest should define the specific eligibility conditions that should apply to a hosting entity which is already hosting a EuroHPC supercomputer'*. Furthermore, article 15 of the EuroHPC JU Regulation states that 'The maximum EU contribution to such upgrades may not exceed EUR 150 million for the period 2021-2027'.

In consequence, EuroHPC JU will launch Call for Expression of Interest for the selection of EuroHPC supercomputers to be upgraded that are owned or co-owned by EuroHPC JU, on the basis and in accordance with the Council Regulation (EU) 2021/1173, taking into account the EU Financial Regulation[3] where relevant on the basis of Financial Rules of the EuroHPC JU[4]The objective of this call is to provide a financial contribution to upgrade a supercomputer it owns or co-owns. The upgrades should lead to an extension of the supercomputers' lifetime, increase the operational performance, and provide new functionalities to address the evolution of user needs.

For supercomputers it owns, EuroHPC JU shall acquire, jointly with the contracting authorities of the Participating State where the supercomputer is established or with the contracting authorities of the Participating States in the selected hosting consortium the upgrade of the supercomputer. The Joint Undertaking shall own the upgraded features of the supercomputer under the same conditions of ownership of the original EuroHPC supercomputer.

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[3] Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012, *OJ L 193, 30.7.2018, p. 1–222; ("FR")*

(https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32018R1046)

[4] Decision of the Governing Board of the EuroHPC JU No 3/2020 Approving the Financial Rules of the EuroHPC Joint Undertaking readopted by Decision of the Governing Board of the EuroHPC JU No 17/2021 approving the re-adoption of Governing Board Decisions adopted under the framework of Regulation (EU) 2018/1488 and its updated Rules of Procedure in the view of Regulation (EU) 2021/1173.

For the supercomputers it co-owns, the Joint Undertaking will provide a financial contribution to fund the upgrade to the contracting authorities of the Participating State where the supercomputer is established or with the contracting authorities of the Participating States in the selected hosting consortium, or directly with the vendor. The Joint Undertaking shall co-own the upgraded feature under the same conditions of ownership of the original EuroHPC supercomputer.

Hosting entities with EuroHPC supercomputers eligible for an upgrade shall be selected by the Governing Board through a fair and transparent process based, inter alia, on the following criteria:

(a) justification of the upgrade: The Hosting Entity shall provide a technical description of the planned upgrade. This description will include the purpose of the upgrade with clarification about whether this upgrade will also target an increase in overall capability.

(b) compatibility with the original EuroHPC supercomputer;

(c) increase in operational capacity performance of the EuroHPC supercomputer;

(d) provision of an appropriate supporting document proving the commitment of the Member State where the hosting entity is established or of the competent authorities of the Participating States of the hosting consortium to cover the share of the upgrading cost of the EuroHPC supercomputer that is not covered by the Union contribution as set out in Article 5 of the Regulation or any other Union contribution as set out in Article 6 of the Regulation, either until its ownership is transferred by the Joint Undertaking to that hosting entity or until the supercomputer is sold or decommissioned if there is no transfer of ownership.

The Union financial contribution to the EuroHPC JU shall cover up to 35 % of the acquisition costs of the upgrade, depreciated over the expected remaining lifetime of the original supercomputer and up to 35 % of the additional operating costs. The total cost of the upgrade shall not exceed 30 % of the total acquisition cost of the original EuroHPC supercomputer. The remaining total cost of ownership of the supercomputer (including VAT if applicable) shall be covered by the Participating State where the hosting entity is established or by the Participating States in the hosting consortium. The Union's financial contribution to the EuroHPC JU for the objective of this call in 2022 is estimated at a maximum of EUR 33 million. Grants will be established to cover the operating costs of upgraded EuroHPC supercomputers and once agreed the by the Governing Board. The reimbursement from the EuroHPC JU will be calculated on the basis of the declared costs up to the maximum total contribution of the EuroHPC JU or up to a ceiling of 35 % of the declared eligible costs, whichever is lower.

The costs related to the construction of the hosting site per se (i.e., costs related to the building infrastructure that will host the upgraded supercomputer, etc.) shall not be covered by the EuroHPC JU. However, the costs of the preparation and adaptation of the hosting site incurred by the hosting entity that can be directly accounted to the installation of the upgraded supercomputer may be considered as part of the Total Cost of Ownership (TCO) and may thus be considered as eligible costs that can be covered by the EuroHPC JU.

In case the available budget is exhausted without covering all the applications above threshold, the GB may decide to retain some proposals for funding in the next programming period. The decision may take into account the implementation timeline of the applications, giving priority for immediate funding to applications with short term implementation plans.

Quantum computing

The overarching goal is to establish in Europe a world-leading hyper-connected quantum computing service and data infrastructure ecosystem, and to enable the research community and European industry produce world-class outputs and to accelerate the broad exploitation and uptake of European research and technology across the Union.

The primary objective of this action is to make available to users European quantum computers integrated with EuroHPC Participating States supercomputers, in a hybrid configuration, in order to address a growing demand from European industry and academia for applications with industrial, scientific and societal relevance for Europe. The activities should leverage European technology, in particular quantum computing technologies developed within the Quantum Flagship, other European initiatives and national Quantum research programmes of the EuroHPC Participating States. The action should foster the emergence of real use case applications, and mature large-scale quantum computing in Europe. This will contribute to the development of an ecosystem of quantum programming facilities, application libraries and skilled workforce.

The action will cover the acquisition of the quantum computers, their integration with the HPC supercomputing infrastructure, and their operations. The aim is to support multiple proposals with diverse technologies to give European HPC users access to as many different quantum technologies as possible. The action should look for synergies and cooperation with the relevant projects at European or national level developing or testing the different layers of the software stack, quantum applications, or use cases, notably the projects resulting from the Quantum Flagship call HORIZON-CL4-2021-DIGITAL-EMERGING-02-10: Strengthening the quantum software ecosystem for quantum computing platforms.

- **Procurement and operation of the quantum computers for integration into HPC supercomputers**

The EuroHPC JU will launch the procurement for the acquisition and operation of the quantum computers. The quantum computers will be hosted in the Hosting Entity5 selected in the Call for Expression of Interest EUROHPC-2022-CEI-QUT-01. The quantum computers should aim to incorporate to the maximum extent competitive European technology. The aim is to support multiple proposals with diversity in technology and applications, in order to give European HPC users access to as many different quantum technologies and applications as possible.

Pursuant to Article 10 of the EuroHPC JU Regulation, the EuroHPC JU will be the owner of the quantum computers. The Union's contribution from Digital Europe Programme (DEP) funds should cover up to 50% of the acquisition costs plus up to 50% of the operating costs of the quantum computer. The EuroHPC JU estimates that an EU contribution of up to EUR 52 million and an equivalent EUR 52 million MS contribution would allow for the acquisition, operation and integration of at least three quantum computers.

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[5] As specified in the Council Regulation (EU) 2021/1173 establishing the EuroHPC JU, Article 10(2), the hosting entity may represent a Participating State that is a Member State or a hosting consortium.

For security reasons and as the action is directly related to the Union's strategic autonomy, the participation of suppliers in the acquisition of the quantum computers should be conditioned in accordance with Article 12(6) of Regulation (EU) 2021/694, and in accordance with Article 18(4) of that Regulation. The quantum computers will be hosted in the hosting entities selected in the Call for Expression of Interest. The action should cover: (i) the acquisition of the quantum computers/simulators, (ii) their installation in the supercomputer environment of the hosting entity, (iii) the hardware and software integration with the HPC supercomputing infrastructure, (iv) the operation, maintenance and dismantling of the quantum computers.

- **EUROHPC-2022-CEI-QUT- 01: Call for expression of interest for the hosting and operation of European quantum computers integrated in EuroHPC supercomputers**

The EuroHPC Joint Undertaking (JU) will launch a call for expression of interest to identify hosting entities for the procurement and operation of quantum computers, their integration with HPC supercomputers and the development of a quantum software stack. Applicants could be either single European entities or consortia of European entities. The EuroHPC JU will initiate and manage the Calls for Expression of Interest for hosting quantum computers and evaluate the applications received, with the support of independent external experts. The hosting entities will be selected by the Governing Board of the Joint Undertaking following the call for expression of interest.

Following the selection of the hosting entities the EuroHPC JU will initiate the procurement of the quantum computers. The specific conditions of the procurement will be defined in a call for tender. For security related reasons and as the action is directly related to the Union's strategic autonomy, the participation of suppliers in the acquisition of the quantum computers will be subject to conditions in accordance with Article 12(6) of Regulation (EU) 2021/694, and in accordance with Article 18(4) of that Regulation.

The selected hosting entities will sign a hosting agreement with the EuroHPC JU, in accordance with Article 10 of the EuroHPC Regulation, and sign with the EuroHPC JU a grant to cover the Union's share of the operational costs. Pursuant to Article 10 of the Regulation 2021/1173, the EuroHPC JU will be the owner of the quantum computers.

The quantum computers should be hosted in national Supercomputer Centres already established in Member States that are Participating States of the Joint Undertaking. The selection will aim at ensuring a diversity in the technologies and architectures of the different quantum computers to be acquired.

The applications submitted to the call for expression of interest should enable the development of real use cases supporting the adoption of applications with scientific, industrial and societal relevance for Europe. Although identified applications do not need to provide a definite quantum advantage, they must allow the development of libraries for quantum computers/simulators in a HPC environment.

Furthermore, the applications submitted to the call for expression of interest should support the implementation and testing of quantum software stacks, libraries etc., that facilitate the link from a high-level description of algorithms to a low-level implementation on the hardware, for solving concrete

problems and applications expected to demonstrate quantum advantage. The Quantum/HPC integration should follow a co-design approach with the applications that will run on the quantum computers, thus contributing to the development of new quantum software and applications, or improving their performances. The applications, software and the high-level implementation should, to the extent possible, be independent of the underlying qubit platforms and they should be run/tested on as many quantum computing platforms as possible within the EuroHPC infrastructure.

The Union financial contribution to the EuroHPC JU shall cover up to 50 % of the acquisition costs, up to 50 % of the operating costs of the quantum computer, and up to 50% of the integration costs. The remaining total cost of ownership of the quantum computer (including VAT if applicable) shall be covered by the Participating State where the hosting entity is established or by the Participating States in the hosting consortium[4].

Grants will be established to cover the operating costs of the quantum computer[5]. The reimbursement from the EuroHPC JU will be calculated on the basis of the declared costs up to the maximum total contribution of the EuroHPC JU or up to a ceiling of 50 % of the declared eligible costs, whichever is lower.

Grants will be established to cover costs for the integration of the quantum computer with the hosting entity's supercomputer. The reimbursement from the EuroHPC JU will be calculated on the basis of the declared costs up to the maximum total contribution of the EuroHPC JU or up to a ceiling of 50 % of the declared eligible costs, whichever is lower.

The costs related to the adaptation of the hosting site per se (e.g. costs related to the building infrastructure that will host the quantum computer) shall not be covered by the EuroHPC JU. However, the costs of the preparation of the hosting site incurred by the hosting entity that can be directly accounted to the installation of the quantum computer may be considered as part of the Total Cost of Ownership (TCO) and may thus be considered as eligible costs that can be covered by the EuroHPC JU.

The quantum computers can range from pilots and experimental systems to prototypes and operational systems. The quantum computers should have at least 10 qubits, with a 2-qubit gate error rate of less than 1%, or equivalently with a 2-qubit gate fidelity at least above 99%, and allow for a maximum circuit depth and number of entangled qubits by the installation date. The quantum computers should integrate EU technologies and uptake research outputs emanating from Quantum Flagship projects or from national research programmes of the EuroHPC Participating States. Applications to the call for expression of interest should clearly identify the technical features of the targeted quantum computer, including the quantum processing unit (qubits / individual quantum units, entanglement capability, control etc.) and the integration (type interface, interconnection, software stack etc.) between the quantum computer and the rest of the EuroHPC infrastructure.

Therefore, the application to the call for expression of interest should include the request for a grant to cover the integration of the quantum computer with the supercomputer of the hosting entity, including the necessary developments of quantum hardware and the software stack. The application should also explain how access to the quantum computer integrated in the HPC system of the hosting entity will be implemented in agreement with the EuroHPC JU Access Policy. This is of particular importance for applications from entities where the ownership of the HPC system and the quantum computer will be different and the EuroHPC JU does not own HPC resources.

The selected hosting entities should ensure to the extent possible cooperation with complementary projects launched, notably in the area of the EuroHPC-2020-01-b: "Pilot on quantum simulator. Successful

applicants", should establish from the beginning of this cooperation appropriate IP exploitation agreements. They should also contribute to spreading excellence across Europe, notably through the involvement of participants from EuroHPC Participating States currently developing their HPC/quantum infrastructure, and incorporating results emanating from the Quantum Flagship projects or national research programmes of the EuroHPC Participating States.

This action is an EU Synergy call. Grants and procurements can be linked with another grant funded from any other EU funding programme. The grants under both calls will be managed as linked actions.

SPECIFIC CONDITIONS FOR THE CALL FOR EXPRESSION OF INTEREST FOR THE ACQUISITION AND OPERATION OF THE QUANTUM COMPUTERS	
Expected EuroHPC JU contribution per project	The EuroHPC JU estimates that an EU contribution of between EUR 8 – 10 million matched by a MS contribution of EUR 8 – 10 million per quantum computer would allow for the acquisition and operation of at least three quantum computers covering different qubit technologies
Indicative budget	The total EU contributions to the topic is up to EUR 52 million.
Opening	31 March 2022
Closing	30 June 2022
Type of Action	Call for expression of interest
Eligibility conditions	The eligibility conditions are those established in the EuroHPC JU Council Regulation (EU) 2021/1173. The JU will act as first user and acquire quantum computers or simulators that integrate technology primarily developed in the Union.
	In order to achieve the expected outcomes, and safeguard the Union's strategic assets, interests, autonomy, and security, it is important to avoid a situation of technological dependency on a non-EU source, in a global context that requires the EU to take action to build on its strengths, and to carefully assess and address any strategic weaknesses, vulnerabilities and high-risk dependencies which put at risk the attainment of its ambitions.
	Therefore participation is limited to legal entities established in Member States that are members of the EuroHPC Joint Undertaking. Proposals including entities established in countries outside the scope specified in the call/topic/action will be ineligible.

Energy costs linked to 'Force Majeure' situation due to the Ukraine War

Budget allocation to secure grants in 2023 to cover Union's share of energy costs on operational costs of EuroHPC Supercomputers

In 2023, the Governing Board will be present with a proposal to provide grants which will be established to cover the operating costs of EuroHPC supercomputers to cover Union's share of energy costs for the running of operational EuroHPC JU supercomputers. All EuroHPC JU supercomputers which are operational from 24 February 2022 (beginning of the Russian -Ukrainian invasion) will be considered eligible. Following a formal and justified request from a Hosting Entity, EuroHPC JU will assess whether the request is fully justified. Potential evaluation criteria include a) increase in cost of energy bill, b) degree of energy bill deviation from original forecast, and/or b) a formal commitment from the Hosting entity consortium members and/or Hosting Member States to match the EuroHPC JU contribution.

The expected JU contribution will be calculated on the basis of the declared energy costs up to the maximum total contribution (35 % for petascale) and (50% for pre-exascale) of the EuroHPC JU of the declared eligible costs, whichever is lower from 24 February 2022 onwards until the 'Force Majeure' comes to an end.

This initiative is being worked out in detail. EuroHPC JU will allocate an EU contribution of up to 12 million Euro in the 2022 Budget and will present a proposal to an upcoming Governing Board in 2023

CONNECTED AND FEDERATED SUPERCOMPUTERS

The EuroHPC JU will develop a federated, secure and hyper-connected European HPC and data infrastructure with midrange supercomputers and at least two high-end (i.e. exascale or beyond) (integrating as much as possible European technology and expertise/knowledge) that is accessible to researchers from academia, industry (including SMEs), and the public sector.

- **EuroHPC Application Support service**

The call aims for the establishment and four-year operation of a distributed European-wide high-performance computing application support service. The selected project should bring together Application Support Teams (AST) established (primarily) in current and upcoming EuroHPC Hosting Entities, operating the EuroHPC supercomputers. ASTs should offer a broad range of support services aiming primarily on Level 2 and 3 application support encompassing at least the following services:

- Application porting and optimization
- Code enabling and scaling
- Elaboration of performance analysis and benchmarks for selected applications
- R&D on code refactoring

- Short to medium term support (3-18 months)
- Domain independent, architecture specific trainings (targeting the EuroHPC supercomputers)
- Development of best practice guides for using the EuroHPC supercomputers.
- Collaboration with equivalent groups at European and International level on technical matters related to supporting pre/exascale application work.
- Contribute to the development and improvement of the European HPC Application Support service by sharing lessons learned and providing feedback to the EuroHPC JU on user requirements and service gaps.
- Customised support to scientific and research community from public and private research institutes and academia, industry and SMEs.

The project should establish a coordination layer between the participating teams, allowing exchange of knowledge, information, as well as harmonization of a range of services and service level provided. The size of the selected ASTs should be proportional to the size of the local system supported and is expected to be in the range of 4-6 experts for pre-exascale level systems and beyond, and in the range of 2-4 experts for petascale and mid-range systems.

ASTs will work closely with the EuroHPC JU peer review office managing the evaluation and allocation of access time to European HPC supercomputers as the applications and respective user teams to be supported will be primarily selected by peer-review process managed by the EuroHPC JU. Through this process ASTs are expected to provide their services to high-potential, high-demanding applications which have been allocated time in the context of the EuroHPC JU Extreme Scale and Regular Access calls.

The project should offer a single point of contact (in the form of a European HPC Application Support portal) that will allow European HPC users to be informed on the systems offered by the Joint Undertaking, their architectures, their access mechanisms, and the support services available.

ASTs are also expected to cooperate with key support actions funded by the EuroHPC JU, including EuroCC (Competence Centres), the Centres of Excellence (CoEs), and future training initiatives. Finally, the project should include the organisation of specialized training events and workshops in the context of high-profile international HPC events like the EuroHPC Summit, ISC etc.

Specific conditions	
Expected EuroHPC JU contribution per project	The EuroHPC JU estimates that an EU contribution of EUR 5 million and an equivalent of EUR 5 million EUR contribution from Participating States would allow these outcomes to be addressed appropriately. Only one proposal is expected to be retained
Indicative budget	The total indicative EU budget for the topic is EUR 5 million.
Type of Action	Grant for 4 years
Eligibility conditions	The conditions are described in General Annex B.

- ***Federation of supercomputing and data resources***

Deployment and operation of a platform for federating resources (including High Performance Computing, quantum computing and data resources) providing Union-wide, cloud-based secure services for a wide range of public and private users across Europe.

A solution will be deployed on top of specific dedicated resources in order to create a federated EuroHPC infrastructure.

Indicative EU budget for the topic is EUR 40 million with an EU funding rate of up to 50%.

A Call may be agreed by the Governing Board in 2023

- ***Hyperconnectivity***

Study for hyper-connectivity for HPC resources

One of the key goals of the EuroHPC Joint Undertaking is to establish in Europe a world-leading hyper-connected, federated and secure High-Performance Computing and quantum computing service and data infrastructure ecosystem. A major step for this objective is to connect the EuroHPC and national supercomputers and data infrastructures with state-of-the-art networking technologies, making them widely accessible across the Union in view of providing computing and data services to a wide range of public and private users in Europe via ultra-high speed connectivity services. The EuroHPC will target aggregated transmission rates in the order of Terabits per second to make these resources and services accessible across the Union. This will enable the different providers involved in the HPC ecosystem to interoperate and exchange data with each other with the highest level of operational availability, benefitting the scientific user communities primarily connected by the GÉANT network and its national members, the National Research and Education Networks (NRENs).

Scope

The study should provide analysis and specification of the HPC connectivity requirements in Europe, in views to have a clear specification of the hyper-connectivity service to be provided to EuroHPC, and the implementation roadmap to develop a federated, secure, and hyper-connected European HPC and data infrastructure, accessible via the cloud.

The study shall cover and analyse exhaustively the different aspects of the required hyper-connectivity needs and services (e.g. traffic, capacity, availability, minimum requirements for hyper-connectivity, network architectures, users, operations, interoperability, security/privacy, evolution, available technology solutions, relevant market actors, etc.) and provide options for the implementation, that are forward looking on new usages related to link with scientific instruments, urgent computing or AI. The solutions proposed should be progressive and flexible to adapt to the growing data traffic needs, changing use cases to be interconnected to the HPC resources, and inclusion of additional users and digital infrastructures or services.

The solutions proposed in the study for the HPC hyper-connectivity services must leverage the GÉANT (and NRENs) networks, and must take into account complementary connectivity of European activities, including the ongoing Framework Partnership Agreement for Research and Education Networks (GN5-FPA) and its associated specific grant agreements, and complement it, catering for untargeted requirements specific to HPC in order avoid unnecessary duplications. The hyper-connectivity services options should take into account the necessary compatibility and interoperability needs of the future federation of HPC infrastructures and services, considering interdepencies with other EU initiatives (e.g. Cloud Federation; DestinE; Human Brain Project; EOSC; European Common Data Spaces; etc.). The study shall be carried out in close consultation with the EuroHPC hosting sites and the HPC stakeholders (including connectivity players).

Deliverables

The main deliverables of the study are:

- Infrastructure and Service Specifications (including Network Architecture and Service Catalogue);
- Hyper-connectivity needs analysis for EuroHPC and other relevant national supercomputing and data infrastructures (considering related EU initiatives);
- Market analysis with potential solutions;
- Gap Analysis with GN5-FPA and other EU connectivity initiatives;
- Implementation Roadmap (including Calendar Requirements for Integrating new Sites and Budget).
- Recommendation on financial instrument for the implementation of the hyper-connectivity service.

Expected outcome

The result of the market study should provide an exhaustive analysis of the communication needs for the EuroHPC HPC and other relevant European and national supercomputing and data infrastructures (e.g. European common data spaces), available technology and available service providers, of the landscape and user. It should facilitate an informed view of the implementation options, including the description of services to be provided, network architecture, implementation instruments, budgeting. Finally, the study should provide the detailed specifications for the provisioning of the hyper-connectivity services to be provided to EuroHPC.

SPECIFIC CONDITIONS	
Expected EuroHPC JU contribution per project	The EuroHPC JU estimates that an EU contribution of about EUR 900 000 would allow these outcomes to be addressed appropriately. The expected duration of this action is 6 months.
Indicative budget	The total indicative budget for the topic is EUR 900 000.
Type of Action	Procurement

Eligibility conditions	The conditions are described in the tender documents.
	This call may be subject to restrictions due to security reasons.

TECHNOLOGY – RESEARCH AND INNOVATION (R&I)

The European Chips Act identified RISC-V as one of the next-generation technology where Europe should invest in order to preserve and strengthen its leadership in research and innovation as well as in equipment manufacturing, contributing to build and reinforce the Union's own capacity to innovate in the design, manufacturing and packaging of advanced, energy-efficient and secure chips, and turn them into manufactured products. This spans from micro-controllers up to high-end chips needed for data centres and supercomputers. Early on the technology development should be tied to big industrial use cases to make sure the development addresses a broader European market and contributes to the digital sovereignty beyond scientific HPC. These developments do not only target the state‑driven supercomputer‑market but primarily broader, industry‑driven markets. Processor development will be driven by industry use cases in cloud and server market. [6]

The RISC-V technology is a credible energy-efficient alternative to the proprietary solutions for processors and accelerators across the computing continuum that are produced outside the EU. The report "*Recommendations and Roadmap for European Sovereignty in Open Source Hardware, Software, and RISC-V Technologies*" [7] elaborated for the Commission by an expert group identified the relevant activities in RISC-V to achieve the above mentioned objectives. It includes High Performance Computing as an application domain for the high-end chips.

The vision of the EuroHPC technology pillar is to develop European critical energy-efficient exascale and post-exascale technologies, architectures and systems technology and their integration in pilot systems, complemented with the deployment of world-class competitive exascale and post-exascale supercomputers based on this technology. This vision is fully in line with the EuroHPC JU regulation's objective of establishing an effective link between technology supply, co-design with users, and future actions involving joint procurement of world-class systems, in order to create a world-class ecosystem in HPC technologies and applications across Europe. This vision should be implemented by a long-term partnership in two steps: one supporting the necessary R&I for technology development, test and integration; followed by an ambitious action for building and deploying the exascale and post-exascale supercomputers based on this technology.

These activities are aligned and complementary to the other activities to be carried out by the KDT/Chips JU and will leverage and contribute to the common work to establish a rich RISC-V ecosystem in Europe.

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[6] Citation from MASP 2021, page 19

[7] https://digital-strategy.ec.europa.eu/en/library/recommendations-and-roadmap-european-sovereignty-open-source-hardware-software-and-risc-v

The results of the RISC-V activities supported by the EuroHPC JU are expected to hugely contribute to this ecosystem, in particular for other key sectors using high-end elements such as data centres. The KDT/Chips JU is expected to develop the other vertical sectors besides the high end chips and address the horizontal foundational activities underpinning the development of the full RISC-V ecosystem in Europe.

Framework Partnership Agreement (FPA) for developing a large-scale European initiative for High Performance Computing (HPC) ecosystem based on RISC-V

Scope: the aim is to support a Framework Partnership Agreement (FPA) establishing a stable and structured long term partnership between the EuroHPC JU and a consortium of industry, research organisations and the institutions in High Performance Computing who commit themselves to establishing, coordinating and implementing a strategic and ambitious R&I initiative contributing to the development of innovative HPC hardware and software technology based on the open RISC-V ecosystem, followed by an ambitious action for building and deploying the exascale and post-exascale supercomputers based on this technology.

This partnership will be set up through one single FPA, which will ensure the implementation of the initiative through several complementary parallel and consecutive Specific Grant Agreements (SGAs) that will carry out the different activities in a common framework. The SGAs will be implemented as Research and Innovation Actions (RIA) or Innovation Actions (IA) in function of the concrete objectives of the action. The FPA should be carried out in different phases, which will be triggered after the attainment of appropriate intermediate progress milestones identified by the Consortium. The FPA will permit the coordinated development of the technology, its validation and the nurturing of the ecosystem. The developments should be integrated in at least one pilot demonstrator to validate the developments and demonstrate the scalability potential towards exascale systems. The demonstrator should be installed in a pre-operational environment in European supercomputing centres for user testing and validation. The FPA and its SGAs should target delivering of technological components for building and deploying in the EU exascale and post-exascale supercomputers based on European technology.

The FPA is expected to pursue an inclusive approach in the development of the necessary EU-wide RISC V ecosystem, ensuring European wide participation of relevant stakeholders across the EU and take-up of the technology developed. The FPA should include supercomputing centres, research institutes, universities, RTOs, industry, SMEs as well as any other organisations that can play a role in the realisation of the objectives of the initiative. The participation of the leading supercomputing centres in Europe is essential to provide upfront the general specifications of the future European supercomputers to ensure the proper alignment of the technological developments to the needs of the users. In addition, the FPA should aim towards a strong participation of the European HPC supplier as well as server/cloud supplier industry, including SMEs, so that they can leverage on existing technological developments and activities and, reinforce their capabilities of becoming leading technology suppliers.

The FPA should ensure a common framework for implementation by maintaining a long-term roadmap with a critical timeline and milestones of the necessary activities (including also other related activities funded outside EuroHPC) that would be needed to build and deploy exascale and post-exascale systems in Europe using the technology developed in this initiative.

Proposals for FPAs should present an overall view of the different main areas of work to be implemented by SGAs, addressing them in a co-design approach. The co-design approach should bridge the gap between suppliers and users; define the characteristics and technical features of the new hardware architectures and where necessary the additional key components, existing or to be developed; as well as better computational methods and algorithms adapted to future real HPC application needs with a minimum significative number of use cases that demonstrate the capability of the developed solutions for solving concrete and challenging computational problems demonstrating a competitive edge in application areas that are crucial for the Union. The FPA should address in a co-design approach at least the topics listed below:

1) RISC-V hardware: addressing the design, development, testing, tape-out of different generations of energy efficient high-end processors and/or accelerators, in particular chiplet-based approaches, for High Performance Computing (HPC), also linked to cloud or data server use cases, using synergies with designs and components developed by projects funded through the Key Digital Technologies Joint Undertaking resp. Chips Joint Undertaking where relevant,
2) integration in test-beds and at least one pilot in pre-operational environments in supercomputing centres for user testing and validation.
3) RISC-V software: develop the full SW stack and the associated software ecosystem for the developed processors and/or accelerators, addressing the system, middleware and application layers. The development should be driven by the needs of relevant HPC workflows and application requirements and cloud or data server use cases where relevant.
4) Develop and/or adapt the other necessary technologies for the integration of the RISC-V based components into industrial grade HPC solutions.
5) Identify the most critical HPC applications and domains and work towards porting and optimising them for the new RISC-V based environment, and the wide take-up of the developed technology by users.
6) Explore and exploit existing manufacturing capabilities in Europe, including existing or under development pilot lines, to fabricate the required components.

The FPA should develop mechanisms guaranteeing that all IP generated in the initiative stays in the EU and will not be transferred to third countries, dedicating an appropriate effort to IP management, protection and exploitation (i.e., IP licensing, IP warranty, etc.).

The FPA should present a professional project structure management, a strategic R&I roadmap to implement the activities, and governance that are appropriate to coordinate the implementation of the future SGAs, including addressing the industrial use cases, and to deliver effectively and efficiently the main results of the initiative. The FPA should put in place appropriate management and progress control mechanisms, in particular, the establishment of common milestones for the SGAs and an intermediate main assessment point to assess the correct advancement of the different work lines towards the goals of the overall initiative.

The FPA should establish interaction with the relevant stakeholders and Programs of the KDT/Chips JU to coordinate work on horizontal issues common to both communities and exploit synergies where relevant, in particular for pilot lines for high end components, common design rules and tools.

Expected Outcome: Framework Programme Agreement (FPA) for European hardware and software technologies, based on RISC-V in order to deliver high-end processors and/or accelerators and systems

based on a strategic research roadmap, and the realisation of test-beds, pilots and/or demonstrators, integrating these processors.

The FPA is expected to address the following outcomes:

- Contribution towards European technological sovereignty, by establishing, maintaining and implementing a strategic R&I roadmap that fosters the European capabilities to design, develop and produce the IP related to high-end processors and/or accelerators based on RISC-V, driven by relevant key performance indicators.
- Designing and delivering energy efficient high-end processors and accelerators for HPC based on RISC-V hardware solutions, test-beds, and at least one pilot integrating these processors/accelerators. The development of European processors and/or accelerators should prepare the technology for its future integration in post-exascale supercomputers to be acquired at a later stage by the EuroHPC JU targeting systems incorporating European technologies.
- A suitable software stack, including key elements such as programming models and runtimes (e.g. languages, compilers, programming environments, communication), libraries (e.g. mathematical, data analytics, AI frameworks), tools (e.g. debuggers, performance, system monitoring), operating system components (e.g. schedulers, workflows, software management, security), and other elements (e.g. for networking, software deployment, system-level composability and modularity of software, etc.).
- The necessary components adapted for the integration of the RISC-V based components in industrial grade HPC or Cloud solutions.
- A selected set of critical HPC applications, encompassing amongst others the mayor EuroHPC use-cases, ported and optimised to the new RISC-V based environment, based on a co-design approach.
- Standards and interface specifications for the software and hardware stack, with clear definition of standardization and licensing schemes of the developed Intellectual Property (IP), with mechanism to guarantee that this IP remains in the EU.
- Reinforce the use of pilot lines based in Europe and, widen the skill base for the design and manufacturing of high-end components.
- A long-term roadmap with a critical timeline, milestones and all the necessary activities that would be needed to build and deploy post-exascale systems in Europe using European technology.

Specific conditions	
Expected EuroHPC JU contribution	The EuroHPC JU estimates that an EU contribution of EUR 135 million matched by the Participating States with a similar amount would allow these outcomes to be addressed appropriately. Only one proposal is expected to be retained. The expected duration of this action is 6 years.
Type of Action	Framework Programme Agreement (FPA)

Call opening	16/12/2022
Call closing	31/3/2023
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply:
	In order to achieve the expected outcomes, and safeguard the Union's strategic assets, interests, autonomy, or security, participation is limited to legal entities established in Member States and in the following Associated Countries to Horizon Europe: Iceland, Norway. Proposals including entities established in countries outside this scope specified in the topic/call/action will be ineligible.
	For the duly justified and exceptional reasons listed in the paragraph above, in order to guarantee the protection of the strategic interests of the Union and its Member States, legal entities established in a Member State or in Iceland and Norway, that are directly or indirectly controlled by third countries that are not OECD countries or by legal entities of third countries that are not OECD countries are not eligible to participate.

INTERNATIONAL COOPERATION

— **International Activities**

The EuroHPC JU Regulation gives a mandate to the EuroHPC JU to develop strategic research and innovation partnerships in HPC with third countries like Japan, Brazil, USA and India that enables advancing the work on HPC applications in domains of common interest, including facilitating access for researchers to EuroHPC JU resources and co-development of HPC applications. The European HPC ecosystem will be further reinforced by enabling European stakeholders to develop novel algorithms, implement them in state-of-the-art codes and architectures, and test the applications and codes in academic and industrial cases to benefit both Europe and like-minded third countries.

In 2022, EuroHPC JU will implement the the High Performance Computing (HPC) aspects of JAPAN-EU DIGITAL PARTNERSHIP[8] Agreement reached by the European Union and Japan in May 2022 . The 2022 Japan-EU Digital Partnership called for strengthening Japan-EU digital cooperation to support an inclusive, sustainable, human-centric digital transformation. High Performance Computing (HPC) is identified as a priority area for such cooperation, focusing on the optimisation of HPC applications in domains of common interest for future generations of supercomputing platforms/architectures (pre-exascale, exascale, post-exascale, hybrid Quantum-HPC) and promoting the use of such supercomputers in the EU and Japan.

In this agreement, it states: "*both sides agreed to explore modalities of reciprocal access for researchers to their respective supercomputing and quantum computing infrastructures, notably the utilisation of the "Fugaku" and EU/EuroHPC, JU's LUMI, Leonardo and MareNostrum supercomputers (once they are*

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[8] EU-Japan Summit: strengthening our partnership | Shaping Europe's digital future (europa.eu)

operational), in conformity with the respective supercomputers' access policy. In addition, both sides should exchange information regarding optimising HPC applications of common interest for future generations of supercomputing platforms/architectures (pre-exascale, exascale, post-exascale, hybrid Quantum-HPC). The starting point could include applications related to biomedical, material science, seismic/tsunami and/or weather and climate modelling."

EuroHPC JU will seek to establish an agreement with Japanese Supercomputing Centres that are participating in the action to establish the conditions for reciprocal access for researchers to their respective supercomputing and quantum computing infrastructures, in conformity with the respective supercomputers' access policy.

Furthermore, EuroHPC JU will launch a call to develop a collaboration in HPC with Japan, advancing the optimisation and co-development of HPC applications in domains of common interest, promoting the exchange of researchers and engineers between Japan and the EU. For technical reasons, this call will be launched in 2023.

Scope:

Support the implementation of the Japan-EU Digital Partnership in order to strengthen cooperation with Japan, addressing the priority domains of the HPC collaboration identified in the Partnership.

Proposals should address all the identified priority domains, with activities in HPC applications such as co-development of applications in biomedical, material science, seismic/tsunami and/or weather and climate modelling, performance measuring, test and optimisation for different architectures; promoting the exchange of researchers and engineers between Japan and the EU, and elaborating a roadmap for future actions to enhance cooperation.

Proposals should clearly demonstrate a clear link with the existing European HPC Centres of Excellence supported in the identified priority domains.

Proposals should describe the facilitation of reciprocal access for European and Japanese researchers to advanced Japanese and EuroHPC JU supercomputing resources (notably the utilisation of the "Fugaku" and EU/EuroHPC's LUMI, Leonardo and MareNostrum 5 supercomputers), in conformity with the respective supercomputers' access policy. It is expected that the EuroHPC JU and Japanese HPC entities will provide dedicated computing time in their respective infrastructure to run HPC applications of European and Japanese users in the frame of this action.

Japanese partners will not be funded by the EU and they are expected to participate in the project with their own funding.

Expected Outcome:

- Strengthening the European HPC ecosystem by enabling European stakeholders to enhance HPC applications and codes in academic and industrial cases of interest for Europe and Japan in the identified priority domains.

- Improved sharing of information and expertise to solve common societal problems with the use of advanced computing.

- Facilitating the exchange of researchers and engineers between Japan and the EU and their access to advanced Japanese and EuroHPC JU supercomputing resources.

- Improved international cooperation of EU-Japan HPC communities on advanced HPC application development, with a roadmap for future collaboration in targeted areas.

Specific conditions	
Expected EuroHPC JU contribution per project	The EuroHPC JU estimates that an EU contribution of EUR 5 million and a duration of up to 3 years would allow these outcomes to be addressed appropriately. Only one proposal is expected to be retained
Indicative budget	The total indicative EU budget for the topic is EUR 5 million.
Type of Action	RIA – for technical reasons, this call will be launched in 2023
Eligibility conditions	The conditions are described in General Annex B.

APPLICATIONS AND HPC CENTRES OF EXCELLENCE

- **CALL ON CENTRES OF EXCELLENCE FOR HPC APPLICATIONS**

HORIZON-EUROHPC-JU-2021-COE-01

Conditions for the Call

Indicative budget(s)

Topics	Type of Action	Budgets EU contribution (EUR million)	Expected EU contribution per project (EUR million)[6]
		2021	
Opening: 27 Jan 2022 Deadline(s): 06 Apr 2022			
HORIZON-EUROHPC-JU-2021-COE-01-01	RIA	45.00	2.00 to 4.00
HORIZON-EUROHPC-JU-2021-COE-01-02	RIA		2.00 to 3.00
Overall indicative budget		45.00	

General conditions relating to this call

Moving applications to exascale requires significant changes and in some cases current application codes cannot run on exascale or post-exascale systems without a complete rethink or substantial code rewrite. Action at European level is needed to support this transition in collaboration with the relevant communities that are key for the evolution of the codes. Changes to support the exascale transition have to take into consideration the heterogeneity of most architectures, code scalability and resilience, and the management of complex workflows at exascale.

In order to allow a balanced coverage between topics, the following minimum amounts of JU contribution will be allocated to proposals eligible for funding:

HORIZON-EUROHPC-JU-2021-COE-01-01: minimum EU contribution of EUR 15 million

HORIZON-EUROHPC-JU-2021-COE-01-02: minimum EU contribution of EUR 15 million

Proposals are invited against the following topic(s):

HORIZON-EUROHPC-JU-2021-COE-01-01: Centres of Excellence preparing applications in the Exascale era

Specific conditions	
Expected EU contribution per project	The EuroHPC JU estimates that an EU and Participating State contribution of between EUR 4 - 8 million per project would allow these outcomes to be addressed appropriately. The expected duration of this action is 4 years. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Type of Action	Research and Innovation Actions
Admissibility conditions	The page limit of the application is 70 pages.
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply:
	In order to achieve the expected outcomes, and safeguard the Union's strategic assets, interests, autonomy, and security, it is important to avoid a situation of technological dependency on a non-EU source, in a global context that requires the EU to take action to build on its strengths, and to carefully assess and address any strategic weaknesses, vulnerabilities and high-risk dependencies which put at risk the attainment of its ambitions.
	Moreover, the HPC Applications Centres of Excellence (CoEs) will cover advances of targeted HPC applications towards highly scalable, optimised flagship codes and exascale

	performance, which are highly sensitive from a security and digital autonomy perspective, as they are part of Europe's critical European HPC infrastructure and ecosystem whereby their integrity, resilience and security have to be duly safeguarded from cyber-attacks and other security threats, and given their key role in the functioning of EU's data infrastructures and, given the potential sensitivity of the data processed (including for instance drug discovery testing and/or nuclear research simulations)
	In addition, as the actions implemented by the CoE might address real time critical applications during emergency situations using dedicated supercomputing resources (meant to, for example, save lives by promptly forecasting and mitigating the impacts triggered by pandemics) the EU needs to avoid a situation of technological dependency on a non-EU source for close-to-market critical technologies.
	Therefore participation is limited to legal entities established in Member States and legal entities established in countries associated to Horizon Europe that are members of the EuroHPC Joint Undertaking. Proposals including entities established in countries outside the scope specified in the call/topic/action will be ineligible.
Procedure	To ensure a balanced portfolio covering different domains, HPC applications and geographical areas, grants will be awarded not only in the order of ranking but also to proposals covering domains, communities and applications not represented in higher ranked proposals in the order of ranking provided that the applications attain all thresholds. In case of several proposals with significant overlap in scope, consortium composition or addressing applications that are subject to a higher ranked proposal , only the higher ranked proposal will be retained for funding.

Legal and financial set-up of the Grant Agreements	As an exception from General Annex G of the Horizon Europe Work Programme, the EU-funding rate for eligible costs in grants awarded by the JU for this topic will be up to 50% of the eligible costs. In case a Participating State decided to entrust the EuroHPC Joint Undertaking with the management of its national contributions, this funding rate will be increased by the additional national funding rate for the eligible entities of this country.
	Beneficiaries will be subject to the following additional dissemination obligations:
	- Dissemination of training activities in collaboration with linked grants and relevant Coordination and Support Actions as a coordinated training programme
	Beneficiaries will be subject to the additional exploitation obligations requiring that first exploitation of the results takes place in the European Union and the Participating States of the EuroHPC Joint Undertaking. Applicants must acknowledge this requirement in the proposal and Annex I to the Grant Agreement.
	Where justified, the grant agreement shall provide for the right for the Commission or the relevant funding body to object to transfers of ownership of results, or to grants of an exclusive licence regarding results, if: (a) the beneficiaries which generated the results have received Union funding; (b) the transfer or licensing is to a legal entity established in a non-associated third country; and (c) the transfer or licensing is not in line with Union interests.
	Grants awarded under this topic will have to submit the following deliverable(s):
	- Collaboration Plan
	Beneficiaries will be subject to the following additional obligations regarding open science practices:
	- Provision of software, algorithms and relevant information to use and validate applications

	without undue delay to the wider European HPC user community and in collaboration with linked actions
	Grants awarded under this topic will be linked to the following action(s):
	HORIZON-EUROHPC-JU-2021-COE-01-01 HORIZON-EUROHPC-JU-2021-COE-01-02

Expected Outcome: Advancing Lighthouse Exascale Applications, at the frontier of technology and relevant for the communities of HPC users, that enable and promote the use of upcoming exascale and post exascale computing capabilities in collaboration with other High Performance Computer (HPC) stakeholders. The goal is to develop or scale up existing parallel codes towards exascale performance, resulting into tangible benefits mainly for scientific challenges. Proposals for Exascale Lighthouse applications will exploit existing federated resources around Europe, developing available competences, and ensuring multidisciplinary (combining application domain and HPC system, software and algorithm expertise). Examples of Exascale Lighthouse applications include weather forecast and climate change, material science, natural hazards, digital twin of the human body.

Scope: Proposals for Centres of Excellence in Topic HORIZON-JTI-EuroHPC-2021-COE-01-01 must clearly identify the Exascale Lighthouse applications addressed, and must convincingly demonstrate their exascale capabilities and needs. Proposals should also be able to articulate clearly the scientific grand challenge(s) which will be addressed by the applications and why the exascale performance is needed. Targeted applications should be relevant for communities of HPC users as well as for future EuroHPC JU systems to be acquired. Proposals should be inherently committed to co-design activities to ensure that future HPC architectures are well suited for the applications and their users.

Requirements for CoEs:

- Clear identification of the targeted applications and related codes, including their user basis and the global impact in their domain.
- Demonstrable advances of the targeted HPC applications towards highly scalable, optimised flagship codes and exascale performance (both computing and extreme data). This includes developing, maintaining, porting, optimising (if needed re-designing) and scaling HPC application codes, addressing the full scientific/industrial workflow, particularly covering data aspects; testing and validating codes and quality assurance
- Addressing the exascale and post exascale related technical challenges, such as load balancing; resilience; heterogeneity programming models, in particular accelerator-based architecture programming; run-time systems; workflow management tools; development environments and production environments.
- Involvement in co-design activities (hardware, software, codes), including the collaboration with HPC vendors and the identification of suitable applications relevant to the development of

European HPC technologies towards exascale and collaboration with European initiatives (e.g. EPI, RISC-V, EuroHPC JU Pilots).

− Activities to improve the energy efficiency of applications, algorithms, methods, libraries and/or tools.

− Enlarging and expanding HPC applications development and use, in particular for new user communities in EU countries and countries associated to Horizon Europe that are members of the EuroHPC Joint Undertaking currently developing and advancing their HPC infrastructure and ecosystem.

− Federating capabilities and integrating communities around exascale computing in Europe.

− Include clear KPIs on the optimal employment of current and/or emerging HPC technologies, allowing the assessment of the progress towards the objectives, both in terms of outputs and ultimate impact.

− Coordinate within the European ecosystem, including Competence Centres, to address the skills gap in the targeted exascale applications and codes, by specialised training and capacity building measures to develop the human capital resources for increased adoption of exascale solutions.

− Coordinate with Competence Centres to ensure wider access to codes and foster their uptake by scientific user communities.

− Proposals should ensure the cooperation with complementary projects launched specifically in the area of the "EuroHPC-2020-01-a: Advanced Pilots towards the European Supercomputers" including also the need to establish from the beginning of this cooperation appropriate IP exploitation agreements and should provide preliminary benchmarking data on new and emerging HPC technologies.

In addition, proposals should ensure collaboration with other Centres of Excellence for HPC applications, and other national and EU funded activities that focus on similar or complementary objectives for HPC codes and applications, in order to maximise the synergies and optimise such codes and applications for current and future architectures of EuroHPC supercomputers. Proposals should also clearly demonstrate that all partners in the consortium have a significant and justified role, including appropriate deliverables under their responsibility which cover their specific contributions.

HORIZON-EUROHPC-JU-2021-COE-01-02: Centres of Excellence for supporting supercomputing applications for Science and Innovation

Specific conditions	
Expected EU contribution per project	The EuroHPC JU estimates that an EU and Participating State contribution of between EUR 4 - 6 million per project would allow these outcomes to be addressed appropriately. The expected duration of this action is 4 years. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Type of Action	Research and Innovation Actions

Admissibility conditions	The page limit of the application is 70 pages.
Eligibility conditions	The conditions are described in General Annex B. The following exceptions apply:

In order to achieve the expected outcomes, and safeguard the Union's strategic assets, interests, autonomy, and security, it is important to avoid a situation of technological dependency on a non-EU source, in a global context that requires the EU to take action to build on its strengths, and to carefully assess and address any strategic weaknesses, vulnerabilities and high-risk dependencies which put at risk the attainment of its ambitions.

Moreover, the HPC Applications Centres of Excellence (CoEs) will cover advances of targeted HPC applications towards highly scalable, optimised flagship codes and exascale performance, which are highly sensitive from a security and digital autonomy perspective, as they are part of Europe's critical European HPC infrastructure and ecosystem whereby their integrity, resilience and security have to be duly safeguarded from cyber-attacks and other security threats, and given their key role in the functioning of EU's data infrastructures and, given the potential sensitivity of the data processed (including for instance drug discovery testing and/or nuclear research simulations)

In addition, as the actions implemented by the CoE might address real time critical applications during emergency situations using dedicated supercomputing resources (meant to, for example, save lives by promptly forecasting and mitigating the impacts triggered by pandemics) the EU needs to avoid a situation of technological dependency on a non-EU source for close-to-market critical technologies.

Therefore participation is limited to legal entities established in Member States and legal entities established in countries associated to Horizon Europe that are members of the EuroHPC Joint |

	Undertaking. Proposals including entities established in countries outside the scope specified in the call/topic/action will be ineligible.
Procedure	To ensure a balanced portfolio covering different domains, HPC applications and geographical areas, grants will be awarded not only in the order of ranking but also to proposals covering domains, communities and applications not represented in higher ranked proposals in the order of ranking provided that the applications attain all thresholds. In case of several proposals with significant overlap in scope, consortium composition or addressing applications that are subject to a higher ranked proposal , only the higher ranked proposal will be retained for funding.
Legal and financial set-up of the Grant Agreements	As an exception from General Annex G of the Horizon Europe Work Programme, the EU-funding rate for eligible costs in grants awarded by the JU for this topic will be up to 50% of the eligible costs. In case a Participating State decided to entrust the EuroHPC Joint Undertaking with the management of its national contributions, this funding rate will be increased by the additional national funding rate for the eligible entities of this country. Beneficiaries will be subject to the following additional dissemination obligations: - Dissemination of training activities in collaboration with linked grants and relevant Coordination and Support Actions as a coordinated training programme Beneficiaries will be subject to the additional exploitation obligations requiring that first exploitation of the results takes place in the European Union and the Participating States of the EuroHPC Joint Undertaking. Applicants must acknowledge this requirement in the proposal and Annex I to the Grant Agreement.

	Where justified, the grant agreement shall provide for the right for the Commission or the relevant funding body to object to transfers of ownership of results, or to grants of an exclusive licence regarding results, if: (a) the beneficiaries which generated the results have received Union funding; (b) the transfer or licensing is to a legal entity established in a non-associated third country; and (c) the transfer or licensing is not in line with Union interests.
	Grants awarded under this topic will have to submit the following deliverable(s):
	- Collaboration Plan
	Beneficiaries will be subject to the following additional obligations regarding open science practices:
	- Provision of software, algorithms and relevant information to use and validate applications without undue delay to the wider European HPC user community and in collaboration with linked actions
	Grants awarded under this topic will be linked to the following action(s):
	HORIZON-EUROHPC-JU-2021-COE-01-01 HORIZON-EUROHPC-JU-2021-COE-01-02

Expected Outcome: Advancing the transition towards exascale capabilities by developing or scaling up existing parallel codes, resulting into effective applications to solve scientific, industrial or societal challenges and addressing the needs of the user communities.

Scope: The Centres of Excellence (CoE) address scientific and industrial applications and user communities that run world leading codes or ensembles that aggregate to pre-exascale workloads, and may require exascale resources in specific cases.

All CoEs should be user-driven and inherently committed to co-design activities to ensure that future HPC architectures are well suited for the applications and their users (both from academia and industry), providing a high performance and scalable application base.

CoEs should federate existing resources around Europe, exploiting available competences, and ensuring multidisciplinary (combining application domain and HPC system, software and algorithm expertise) and synergies with national/regional programmes.

CoEs should further enlarge and expand these capabilities all over Europe, in particular by including users communities from EU countries currently developing and advancing their HPC infrastructure and ecosystem (e.g. countries not currently hosting Tier 0 and/or Tier 1 supercomputing facilities).

Requirements for Centres of Excellence:

- The provision of services supporting different usage models for the community needs, including developing, maintaining, optimising (if needed re-designing) and scaling HPC application codes, addressing the full scientific/industrial workflow, particularly covering data aspects; testing and validating codes and quality assurance,
- Enhancing HPC applications and ensembles of coupled applications towards highly scalable, optimised codes.
- Streamline development, collaboration, automated testing and deployment processes throughout the application development and maintenance cycle, for example, by provisioning and using state-of-the-art development tools, platforms and software management models.
- Fostering pre-exascale-oriented codes and innovative algorithms that address societal challenges and/or are important for key scientific and industrial applications. Demonstration of clear societal, industrial, and/or scientific benefit is mandatory.
- Provision of codes aimed at capacity pre-exascale systems for ensemble workloads that might not need tight interconnection between runs. Proposals must convincingly demonstrate the ensemble pre-exascale capabilities and needs.
- Collaboration with EuroHPC JU systems and infrastructure federation initiatives to implement a robust and reliable automated deployment process for applications, in order to make novel developments timely available to the EuroHPC JU user communities.
- Involvement in co-design activities (hardware, software, codes), including the collaboration with HPC vendors and the identification of suitable applications relevant to the development of European HPC technologies towards exascale.
- Enlarging and expanding HPC applications development and use, in particular for new users communities in EU countries and countries associated to Horizon Europe that are members of the EuroHPC Joint Undertaking currently developing and advancing their HPC infrastructure and ecosystem.
- Ensure wider access to codes and foster their uptake by user communities, in particular industry and SMEs.
- Federating capabilities and integrating communities around exascale computing in Europe.
- Address the skills gap in the targeted domain by specialised training and capacity building measures to develop the human capital resources for increased adoption of advanced HPC in industry and academia.
- Complementarity and synergy with National HPC Competence Centres and EU projects.
- Include clear KPIs on the optimal employment of current and/or emerging HPC technologies, allowing the assessment of the progress towards the objectives, both in terms of outputs and ultimate impact.

Proposals should ensure the cooperation with complementary projects launched by the EuroHPC JU including also the need to establish from the beginning of this cooperation appropriate IP exploitation

agreements and should provide preliminary benchmarking data on new and emerging HPC technologies. Proposals should also clearly demonstrate that all partners in the consortium have a significant and justified role, including appropriate deliverables under their responsibility which cover their specific contributions.

- **New algorithms for applications on European exascale supercomputers**

The availability of new European hardware and supercomputer architectures for exascale and post-exascale computers requires the radical redesign, reimplementation and even reinvention of algorithms to exploit the massively parallel and heterogeneous processing capabilities. In order to boost the performance of HPC applications to a qualitatively new level on current and future European supercomputers, new approaches must be identified and validated with prototypical technical implementations. In a second funding phase and after evaluation, the most promising proof-of-concept implementations should be developed towards stable software libraries and integrated into applications to achieve a broad impact on the HPC application ecosystem and user community.

Call - New algorithms for applications on European exascale supercomputers

HORIZON-EUROHPC-JU-2022-ALG-02

Conditions for the Call

Indicative budget(s)

Topics	Type of Action	Budgets (EUR million) 2022	Expected EU contribution per project (EUR million)[9]	Number of projects expected to be funded
Opening: 20 Apr 2022 Deadline(s): 27 Oct 2022				
HORIZON-EUROHPC-JU-2022-ALG-02-01	HORIZON-JU-RIA	5.00	4.00 to 5.00	1
Overall indicative budget		5.00		

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[9]   Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

General conditions relating to this call

The availability of new European hardware and supercomputer architectures for exascale and post-exascale computers require the radical redesign, reimplementation and even reinvention of algorithms to exploit the massively parallel and heterogeneous processing capabilities. Whilst porting applications, for example to accelerated systems, often notably increases performance and reduces power consumption of HPC applications, ground breaking performance gains which allow the solution of computational problems currently considered intractable require the conversion of innovative concepts to novel algorithms and their efficient and reliable implementation. In order to boost the performance of HPC applications to a qualitatively new level on current and future European supercomputers, new approaches must be identified and validated with prototypical implementations.

Proposals are invited against the following topic(s):

- **HORIZON-EUROHPC-JU-2022-ALG-02-01: New algorithms for applications on European exascale supercomputers**

Specific conditions	
Expected EU contribution per project	It is estimated that an EU contribution of 5.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
Indicative budget	The total indicative budget for the topic is EUR 5.00 million.
Type of Action	HORIZON JU Research and Innovation Actions
Eligibility conditions	The conditions are described in General Annex B. The following additional eligibility criteria apply: Types of entities: - Supercomputing centres - Research and academic institutions focused on HPC - Other entities in exceptional and well-justified cases such as for-profit entities directly participating in the European exascale initiatives at a relevant technical level
Technology Readiness Level	Activities are expected start at TRL 0-1 and achieve TRL 3-4 by the end of the project – see General Annex B.
Procedure	The granting authority can fund a maximum of one project.

Legal and financial set-up of the Grant Agreements	The EU-funding rate for eligible costs in grants awarded by the JU for this topic will be up to 100% of the eligible costs. Beneficiaries may provide financial support to third parties. The support to third parties can only be provided in the form of grants. The maximum amount to be granted to each third party is EUR 200 000. The threshold for financial support to third parties referred to in Article 204 of the Financial Regulation may be exceeded where it is necessary to achieve the objectives of the action. Since the development and implementation of a new algorithm from TRL 0-1 to TRL 3-4 requires substantial personnel resources, a threshold of EUR 200 000 will apply. The higher threshold reflects the estimated required effort of up to two full-time equivalent (FTE) developers for a duration of up to 12 months and the associated personnel costs according to the usual remuneration in some eligible countries. Beneficiaries and third parties receiving financial support under this topic will be subject to the additional exploitation obligations requiring that first exploitation of the results takes place in the European Union and the Participating States of the EuroHPC Joint Undertaking. Applicants must acknowledge this requirement in the proposal and Annex I to the Grant Agreement. Where justified, the grant agreement shall provide for the right for the Commission or the relevant funding body to object to transfers of ownership of results, or to grants of an exclusive licence regarding results, if: (a) the beneficiaries or third parties which generated the results have received Union funding; (b) the transfer or licensing is to a legal entity established in a non-associated third country; and (c) the transfer or licensing is not in line with Union interests.
Consortium agreement	Members of consortium are required to conclude a consortium agreement, in principle prior to the signature of the grant agreement.

Expected Outcome: At the end of the action, the following will be accomplished:

- Contribution to the realisation of the EuroHPC overall and specific objectives

- Novel and outstanding ideas to address the exascale challenge in HPC applications will be identified and the potential impact on HPC applications substantiated by a proof-of-concept implementation

- Wider participation of researchers in the exascale challenge from different domains with so far little exposure to exascale technology in the European HPC ecosystem

- Prepared underrepresented research communities to participate in upcoming calls in the field of HPC algorithms and applications

Each third-party which received financial support in this action will deliver by the end of the project at least:

- A proof-of-concept implementation running on real hardware including meaningful benchmark data that demonstrates significant supremacy compared to existing solutions

- With respect to the base line provided in the application for financial support: a revised estimate of the reduction for time-to-solution of a list of applications and use cases, based on the best available benchmark data

- An impact assessment on the reduction of HPC resource consumption taking into account the present usage pattern and potential use cases of the algorithms

- Documentation of the new algorithms and their technical implementation

Objective: The action will provide financial support through an open and competitive call to small teams of researchers to develop novel algorithms for the upcoming European exascale supercomputers. Targeting the highest possible impact on HPC applications, the developed proofs of concepts will demonstrate great potential to solve currently intractable computational challenges or to substantially improve time-to-solution and energy-to-solution for important use cases.

Scope: Proposals are expected to define an outreach approach for identifying and attracting innovative ideas to efficiently exploit current and future European exascale HPC systems. A mechanism involving financial support to third parties should be defined, which will adequately stimulate such innovation potential of researchers and software engineers participating in the action. The focus of the action should aim at solutions to computational problems in an exascale context which are common in European flagship HPC applications, offering outstanding potential to improve their efficiency on European HPC systems and reduce time-to-solution for common use cases, possibly across scientific domains.

The proposal should define the process of selecting novel algorithms to be developed from TRL 0-1 to TRL 3-4 (proof-of-concept), for which financial support will be granted. The central selection criterion for granting financial support to third parties should be based on the expected impact for the imminent exascale era, measured in recovered compute time or reduced time-to-solution taking into account the expected usage pattern on European exascale systems, but also consider novel solutions to computational problems with high impact. Considering the complexity of developing, implementing and validating algorithms for new European hardware and exascale supercomputer architectures, typically the financial support will be in the order of EUR 50 000 – 200 000 per third-party project and should primarily cover personnel costs. At least 80% of the total grant should be allocated to financial support for these third parties.

Calls for proposals should be widely disseminated among the EU and Participating States of the EuroHPC JU. The proposal should clearly describe how relevant target groups are addressed in the different countries. In particular, scientific communities in relevant domains such as applied mathematics, theoretical physics and computer science should be specifically addressed and encouraged to apply.

Additionally, the consortium should

- provide relevant information to applicants for the preparation of their proposals, e. g. on system architecture, software and technical specifications of European exascale technology. Ideally, the consortium should also provide access to exascale technology for specific development purposes to selected projects of third parties as appropriate.

- perform a final review of the funded projects carried out by third parties, including a technical inspection and approval of the developed software, and provide an assessment on each algorithm and implementation. The final reports should include clear and comparable indicators for all projects on the progress made, taking into account the baseline, and the maturity of the implementation at the end of the project.

- collaborate with the national HPC Competence Centres, European Centres of Excellence for HPC Applications and the related coordination actions to organise additional support for third-party projects.

- provide support for coordination with other European projects such as the Advanced Pilots towards the European supercomputers, if relevant for a third-party project.

The JU considers that proposals requesting a contribution from the JU of up to EUR 5 million and a duration of 18 months would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another duration or requesting other amounts. Only one proposal will be selected.

<u>Selection of third parties for financial support: Award criteria and evaluation procedure</u>

The consortium is expected to describe the procedure and the criteria used to ensure appropriate organisations and projects will be selected, in agreement with the provisions of the Digital Europe programme.

When launching calls for proposals for the award of financial support, the consortium members may use their own procedure provided this procedure complies with the principles of proportionality, sound financial management, equal treatment and non-discrimination.

The process should also aim at reducing administrative burden for third parties, while at the same time ensuring sound financial management. In particular, the application forms and procedures should be tailor-made and appropriate to the technical and managerial capacities of the targeted applicants and scope of the projects. Calls for proposals must remain open for at least two months.

Beneficiaries must ensure transparency with adequate publication of calls for proposals and prevent conflicts of interest throughout the entire award procedure. They will have to clearly demonstrate this in their application and report on it throughout the project.

The consortium must publish the outcome of the call(s) on their website, including a description of the selected projects, award dates, project durations, final recipients' legal names and countries of establishment. The indicative timeline for this publication is within two months after the submission deadline of the call the proposal or equivalent date for open-end calls.

Financial support to third parties: Budget, duration and location

- The indicative amount of financial support per third party should be the equivalent of 2 FTEs for 12 months, based on the usual remuneration of the institution for staff in a relevant role. Financial support to one application must not exceed a total amount of EUR 200 000.

- Applicants for financial support to third parties should be able to use simplified cost options and in particular lump sums.

- Activities carried out by third parties must take place in EU Member States or associated countries that are members of the EuroHPC JU.

- Only cost incurred during the grant implementation period can be considered eligible.

Types of organisations/third parties that may receive financial support:

In order to be eligible for financial support, the third parties must neither be affiliated entity(ies) of the beneficiaries nor associates nor contractors. Natural persons are not eligible.

Third-party projects receiving financial support should be subject to at least the following requirements:

- Identify and propose novel, forward-looking and potentially disruptive approaches to the solution of complex mathematical, numerical or data processing problems on current and future European exascale supercomputers.

- Explain the concept and design a fundamentally new and innovative algorithm - porting, reimplementation, incremental improvements or parallelization of an existing implementation are not sufficient.

- Present a sound theoretical concept, substantiated e.g. by peer-reviewed publications, with a credible and convincing plan to achieve a first proof-of-concept implementation which clearly demonstrates significantly superior performance compared to existing solutions and exploits the specific capabilities of exascale supercomputers.

- Solutions must demonstrate the potential to be integrated into important applications, addressing relevant use cases with a broad user base.

- Clearly describe the state of the art (baseline) of the concept and implementation which should be in line with the scope of the call regarding TRL.

- Provide a list of applications frequently used on HPC systems with typical use cases which could substantially benefit from the proposed solution including an estimate of the reduction of time-to-solution for the use cases.

- Algorithms using emerging technology such as quantum computers are only eligible if linked to HPC, for example, by exploiting hybrid quantum-classical exascale architectures.

LEADERSHIP IN USE & SKILLS

National Competence Centres for High Performance Computing

The uptake of HPC services by SMEs, industry, academia and the public sector is a critical element for the development of a sustainable High Performance Computing (HPC) ecosystem in Europe. Pooling resources in a pan-European network of National Competence Centres (NCCs) for HPC fostering coordination, cooperation and collaboration represents a fundamental challenge to unlock the full potential of HPC in Europe and to achieve a more balanced development of the HPC ecosystem among the EuroHPC JU Participating States.

- The further development of existing and the creation of new NCCs for HPC will support the widening of HPC skills, the adoption of HPC and attract new HPC users in the private and public sector. The NCCs will specifically address SMEs which need better access to HPC resources to increase their innovation capability such as tools, services and training programmes tailored for their specific requirements. The NCCs will inter alia engage in training and outreach activities for academic, industrial and public sector users, facilitate access of national stakeholders to European HPC competences and resources addressing different scientific and industrial domains, and liaise with other initiatives including the European Digital Innovation Hubs and **Centres** of Excellence in HPC.

Proposals are invited against the following topic(s):

- **DIGITAL-EUROHPC-JU-2022-NCC-01-01: National Competence Centres for High Performance Computing**

Expected Outcome: By the end of the action, an effective support network in the field of HPC will have been established providing services to local communities from the public and private sector with a specific focus on SMEs. Through cooperation with other European initiatives the network will provide a knowledge hub for HPC offering a comprehensive support infrastructure from basic training and initial uptake of HPC to specialist knowledge covering the entire HPC value chain including related topics such as intellectual property.

In the course of the action, the NCCs will have demonstrated their significant impact on the innovation capacity of the European HPC ecosystem supported by quantitative key performance indicators measuring the specific impact of individual NCCs with respect to the baseline established on the basis of common criteria for all NCCs.

A detailed competence map of the European HPC ecosystem will be available to identify expertise, monitor and assess the evolution HPC competences in the constituencies of the individual NCCs and in a European context.

The NCCs will address the following areas:

- Contribution to the realisation of the EuroHPC overall and specific objectives
- Promoting the use of HPC at national level by identifying relevant users and matching their needs with the available expertise in the HPC Competence Centres
- Effective establishment of a wide range of HPC services (as referred in the scope of the call)
- Support the development of leading-edge, innovative solutions by targeted regional/national stakeholders in the private and public sector
- Provision of support to interested end users that are/will use HPC and HPDA in their daily business.
- Contribute in ensuring European technological autonomy in this field

Objective: The aim is to support existing or the creation of up to one NCC in a maximum number of EuroHPC JU Participating States. The NCCs will provide HPC services to industry (in particular to SMEs), academia and public administrations, delivering tailored/modular solutions for a wide variety of users, with an aim to ease and foster the transition towards wider uptake of HPC in Europe. NCCs will be a focal point of HPC in the respective country, liaising with national initiatives in the area of HPC, facilitating access of national stakeholders to European HPC competences and opportunities in different industrial sectors and domains. SMEs will be central to the NCC's activities. Academic institutions and stakeholders may be addressed only to a limited extent and most of the resources of an NCC will be dedicated to support local SMEs, industry and public services.

Scope: Set-up and operate one Competence Centre for HPC in a maximum number of EuroHPC JU Participating States. The NCC will represent the focal point of national competences in HPC and provide leading-edge knowledge to enable the development of innovative solutions in their constituency, taking into account national HPC needs and requirements emanating from different user communities (industry, academia, public administrations) and application domains. The NCC will establish and maintain a network of national HPC users, promote HPC use in the private and public sector, reach out to potential new users and develop the necessary expertise for HPC applications close to the relevant national and, in collaboration with other NCCs, European communities. Each NCC will act as an access point to the European network of NCCs and other European HPC initiatives such as the Centres of Excellence for HPC applications to ensure that local stakeholders have access to the best available support in Europe if the required expertise can not be provided by the NCC or is out of scope of the NCC's activities. In return, NCCs will support stakeholders from other regions and countries that need their expertise coordinated through the NCC network and the complementary Coordination and Support Action. NCCs will implement a flexible and modular approach in the services to be provided, taking into account the degree of maturity of the national HPC ecosystem and in close coordination and collaboration with the other NCCs to achieve the highest possible impact and the widest possible spread of knowledge, ensure the most efficient use of NCC resources and to avoid duplication of effort among the NCCs and with other initiatives. Proposals

should demonstrate the implementation of effective measures to close the gap between advanced and less developed NCCs.

HPC Competence Centres will, for example, engage in the following activities:

- Facilitate access to the HPC ecosystem including testbeds, hands-on sessions on HPC, HPC application optimising and scaling by connecting national communities with other initiatives such as the European Centres of Excellence for HPC applications.
- Facilitate uptake of HPC applications by different users, including SMEs (e.g. promoting locally relevant success stories), academia and public administrations.
- Provide scientific/technical expertise/consulting through application-oriented HPC knowledge/focus (e.g. HPC and High Performance Data Analytics (HPDA)), as well as access to advanced simulation and modelling algorithms, software codes and tools.
- Contribute with the expertise to the development activities (TRL 4-6) of SMEs and the public services to enable their efficient use of HPC resources (e.g., software porting and customization, deployment of advanced simulation and modelling algorithms, methods, and tools etc.).
- Provide on-site evaluations of new technologies, experimenting, proofs of concept as well as enable validation and demonstration of HPC technologies, software codes, tools, and algorithms in relevant environments.
- Facilitate access to supercomputing and data management for exploring innovation solutions of interest to end users, including SME user industries.
- Local and national training and skills development in the area of HPC and related subjects (e.g. HPDA, parallel programming, etc.), through face-to-face as well as online training (e.g. MOOC platforms).
- Awareness raising and outreach on the benefits of HPC to potential user industries, including SMEs.
- Raise awareness and support national and local communities in identifying and protecting intellectual property in an HPC context and provide advice on licensing policies in collaboration with the pan-European network of NCCs.
- Implement technology transfer activities at local/national level and the Digital Single Market.

It is required that the NCC – hosted by either one or several national organisations - is formally designated and mandated by the national authorities of the EU Member State or the EuroHPC JU Participating State. The NCC must be established as an organisation with appropriate visibility to the national communities and an independent organisational structure. The NCC must ensure that the NCC's activities are clearly identifiable and distinct from activities of the institution(s) hosting the NCC. In general, NCCs should employ HPC specialists, primarily full time, with expertise in areas most relevant for the national communities and NCC staff should not work under external supervision. Applicants are encouraged to implement a pan-European collaboration scheme for talent management including the identification and recruitment of HPC experts by the NCCs. Moreover, proposals should clearly set out an effective governance structure and decision making process within the consortium and the complementary Coordination and Support Action.

Individual NCCs will focus on activities where local support is most effective such as communication, consultation services, support specific to the relevant national and local communities and necessary co-

development to fulfil the mission of NCC. Co-development activities with SMEs should be limited to SMEs and a maximum of 5% of the personnel resources of an NCC may be used for all direct development activities by the NCC. Moreover, development work of NCC staff must not overlap with activities pursued by other NCCs or initiatives and must be duly justified and formally endorsed by the coordinator of the NCC network and/or linked Coordination and Support Action. Actions of potentially broader scope will be coordinated with or transferred to the pan-European network of NCCs and complementary initiatives such as the European Centres of Excellence for HPC. Research activities as well as operation, administration or procurement of HPC systems are not within the scope the NCCs, but NCCs are expected to advise on such activities and support knowledge transfer e. g. from relevant European R&D initiatives to the local HPC ecosystem.

Proposals should clearly describe the mechanisms for exchange of information on the NCCs activities with the coordinator and the relevant Coordination and Support Action to ensure the identification of synergies, take into account lessons learned in preceding similar activities, prevent redundant work and strengthen collaboration and cohesion. The NCCs will further support the coordinator and the relevant Coordination and Support Action in the development, implementation and reporting of common standards such as assessment criteria for NCCs, competence mapping, key performance indicators, measures on the impact of the NCCs on the European HPC ecosystem and a strategic roadmap for the further development of the NCC network.

The JU considers that proposals requesting a contribution from the JU of up to EUR 1 million per national HPC Competence Centres[10] matched by the Participating States with a similar amount, and a duration of 3 years would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals with another duration or requesting other amounts.

Type of Action: DIGITAL JU Simple Grants

DIGITAL-EUROHPC-JU-2022-NCC-01-02: Networking and coordination of national HPC Competence Centres and Centres of Excellence

Expected Outcome: Upon completion of the action, the European HPC ecosystem will be strengthened through an effective network of National Competence Centres (NCCs) supporting the adoption and use of HPC in particular by SMEs, but also by the private and public sector in general, and taking into account the specific needs of the local and national ecosystem. More advanced users and NCCs will benefit from access to the expertise, training and services provided by the European Centres of Excellence for HPC Applications (CoEs) through a single point of contact. The coordinated network will facilitate access to HPC resources and knowledge transfer horizontally and vertically within and between the NCCs and CoEs. The Coordination and Support Action will ensure the network of NCCs and CoEs will be embedded in the European HPC ecosystem with strong links to other European initiatives, for example, in the area of training in HPC.

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[10] Please refer to the Annex of the Work Plan for the contact details of the competent national funding authorities

Moreover, the action will result in

- Contributions to the realisation of the EuroHPC overall and specific objectives
- Effective coordination and exchange of best practices and information among the network of NCCs and CoEs
- Facilitated access to services and training offered at national level to interested NCCs and other potential users (from industry, academia or public sector)
- Maximised visibility and outreach of NCCs and CoEs, in particular to SMEs and industry
- Improved coordination and increased availability of training activities on HPC across NCCs and CoEs and within the European HPC ecosystem

Objective: Central objective of the Coordination and Support Action is to maximize existing European HPC knowledge and expertise across Europe. The tasks and services will provide a single focal point at European level, which will be responsible for the coordination of the National Competence Centres (NCCs) for HPC and the European Centres of Excellence for HPC Applications (CoEs), the exchange of best practices within and between the two initiatives, facilitating the sharing of applications, knowledge and information, networking and training across NCCs and CoEs. In order to accomplish these objectives, the selected consortium will also establish effective cooperation with other European initiatives, in particular regarding a coordinated European training programme on HPC.

Scope: Proposals should aim at coordinating the National Competence Centres (NCCs) for HPC and European Centres of Excellence for HPC Applications (CoEs). In particular, it is expected to establish a communication platform, facilitate dialogue, promote the objectives of the Centres and organize outreach events and workshops (on topics identified by the NCCs and CoEs). The activities should leverage on synergies and complementarity of the centres. It is expected to identify potential training solutions and tools available from the NCCs network and the CoEs to support and assist NCCs in addressing requests and/or needs of their constituencies and help networking of respective national and European activities, for example, through the provision of mentoring and twinning schemes.

The Coordination and Support Action should:

- Coordinate the activities and exchange of best practices across of the NCCs and CoEs
- Assist the development of the NCCs/CoEs and coordinate the collaboration of NCCs and CoEs.
- Organize the sharing of existing HPC codes, libraries and facilitate access to upgraded HPC application codes
- Attract new users and support the engagement of industry and SMEs in CoE's activities, e. g. through the NCC network.
- Advise and support CoEs with the development of sustainability and business plans to diversify their funding sources.
- Educate, advise and support NCCs/CoEs on the adoption of state-of-the-art software development concepts to ensure sustainable, high-quality, reliable and reusable code and coordinate between CoEs and EuroHPC Hosting Entities to ensure applications are promptly available on EuroHPC systems with appropriate quality checks (results are reproducible).
- Provide knowledge and advice to NCCs/CoEs to develop credible and convincing plans for legacy code including the development of best practices and lessons learned

- Educate and assist NCCs/CoEs regarding IP management and licensing policy
- Enhance mobility of HPC specialists between communities, academia, public and private sectors
- Define and monitor meaningful qualitative and quantitative KPIs for NCCs and CoEs to measure the impact of these initiatives on the European HPC ecosystem
- Facilitate access to services and training offered at national level to interested HPC Competence Centres and other potential users (from industry, academia or public sector) and at European level by CoEs
- Maximise visibility and outreach of NCC/CoEs, in particular to SMEs, industry and the public sector beyond academic and research institutions.
- Implement and promote a market place in close collaboration with the NCCs and CoEs for services specifically addressing the needs of SMEs and taking into account the diversity of the European ecosystem.
- Implement and coordinate technology transfer activities at European level and for the Digital Single Market .

It is expected that such an activity will be driven by the relevant actor(s) bringing in the required expertise and a solid and robust track record in offering services in the context of NCCs and CoEs to a variety of users including industry, as well as HPC-related training activities at European level.

The JU considers that proposals requesting a contribution from the EU of up to EUR 3 million and a duration of 3 years would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting another duration or other amounts. Only one proposal will be selected.

Type of Action: DIGITAL JU Coordination and Support Actions

Conditions for the Call - National Competence Centres for High Performance Computing

Opening date(s), deadline(s), indicative budget(s): 11

Topics (Type of Action)	Budgets (EUR million)	Deadlines
	2022	
Opening: 20 April 2022		
DIGITAL-EUROHPC-JU-2022-NCC-01-01 (DIGITAL-JU-SIMPLE)	40.00	28 June 2022
DIGITAL-EUROHPC-JU-2022-NCC-01-02 (DIGITAL-JU-CSA)	3.00	
Overall indicative budget	43.00	

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∅ **_HPC Training Activities_**

HPC technologies evolve at such a fast pace that requires a constant update of these digital skills. More coordination is needed to establish the different training needs, the core competences that are required and the types of trainings activities that should be developed. EuroHPC JU has been allocated EUR 10 million from the Digital Europe Programme – Strategic Objective 4 which is focussed on training and skills. The activities listed below account for EUR 7 million and will be committed in 2022. The remaining EUR 3 million will be allocated in 2023 for training activities.

An action will be developed to tackle two areas of priority which are a) the development of a EuroHPC JU training platform which will support a training portal and b) the continuation of the European contribution to the well-established and respected International HPC Summer School. A consortia will funded to undertake the running of the two initiatives set out below:

- **_Development of EuroHPC Training Platform_**

Scope: To build on the PRACE Training Advanced Centres, to develop a EuroHPC Training Platform which will coordinate existing training initiatives supported by a portal

Objective: EuroHPC JU would like to invite applications from consortia who will develop a EuroHPC Training Platform which will be a portal that will provide a central database of HPC training services based on a user-oriented approach, is inclusive, interactive, easy to administer, and provide a neutral and independent platform to promote training initiatives from across the EuroHPC ecosystem.

Outcome: The Platform would pull together training initiatives including upcoming courses, events organised by EU funded HPCs centres of excellence, national HPC competence centres, EuroHPC hosting entities, EU supercomputing Centres, universities and schools with HPC and Quantum courses, EuroHPC's private members, companies and SMEs. The platform would provide an accessible archive of courses and other learning materials (preferably open and for free). Lastly, the retained consortium would work with experts and European training providers, including other EuroHPC JU initiatives that offer HPC training, to implement a common standardised EuroHPC training framework. The standardisation efforts should lead to a pan-European HPC training and certification scheme, covering existing an new courses offered within the European HPC ecosystem and build on work of existing initiative, in particular the European HPC Certification Forum.

Eligibility: A consortia made up EuroHPC Participating States based organisations. This consortia would operate and maintain the platform on behalf of EuroHPC JU.

- **_EuroHPC support to the International HPC Summer School_**

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Objective: EuroHPC JU would like to build on prior experience to support an International Summer School in HPC and to gradually increase the participation compared to previous International schools.

The existing initiative brings together once a year up to 80 participants . EuroHPC JU would like to bring together 100 advanced HPC users, primarily from the EuroHPC Participating States, annually to meet an share best practice in the field of HPC and Quantum computing.

The Summer School aims to attract HPC users who are usually graduate students and post-doctoral researchers with relevant knowledge in HPC. The participants must come from a number different scientific communities from across the world.

Based on the experience build up by the International HPC Summer School (https://ihpcss.org), EuroHPC JU would like to invite calls to ensure that this cooperation is sustained.

Outcome: The International School brings together once a year up 80-100 advanced HPC users who are usually graduate students and post-doctoral researchers with relevant knowledge in HPC. It will in different locations across the world. The European part of the programme will include up to 40 students from EuroHPC JU participating States and contribute to the costs of organising the weekly long event.

Lectures from leading computational scientists and HPC experts on

- HPC and Big Data challenges in major scientific disciplines
- HPC programming proficiencies
- Performance analysis and profiling
- Software engineering
- Numerical libraries
- Big data analysis and analytics
- Deep learning
- Scientific visualization
- Canadian, European, Japanese and U.S and other third countries HPC-infrastructures

As part of the curricula, participants to the course will be provided with an overview of EuroHPC JU activities.

Eligibility: European organisations who are willing to cooperate with other non-EU organisations and who are part of the IHPCSS organisation committee. They are:

- Extreme Science and Engineering Discovery Environment (XSEDE, United States)
- RIKEN Center for Computational Science (R-CCS, Japan)
- SciNet HPC Consortium (Canada)

Specific conditions: CALL DIGITAL-EUROHPC-JU-2022-TRAINING	
Expected EuroHPCJU contribution per project	The EuroHPC JU estimates that an EU Contribution from DEP SO4 of up to EUR 2 million for this action. Only one proposal is expected to be retained
Indicative budget	The total indicative budget for the topic is EUR 2 million.
Indicative Duration of the Action	2 years
Indicative launch of the Call	15 December 2022
Type of Action	Grant
Eligibility conditions	The conditions are described in General Annex B.

Call to develop EuroHPC traineeships in Hosting Entities, Centres of Excellence and Competence centres SMEs and Industry

The objective is to train future HPC specialists to acquire the necessary advanced digital skills needed for the deployment of a specific technology, by providing traineeships in either an HPC competence centre, companies or SMEs using HPC systems or EuroHPC Hosting Entities. Trainees will be trained 'on the job' to develop their skillsets in HPC infrastructure development, applications and software develop. This will be an opportunity for the trainee to acquire valuable work experience, but also to become proficient and put in practice the advanced HPC skills.. This action is in line with the objectives of the Digital Education Action Plan 2021-2027 and more specifically the strategic priority to enhance digital skills and competences for the digital transformation, boosting advanced digital skills among young people.

Objective: The topic will provide future HPC users access to training and working experience competence centres, companies, SMEs or a EuroHPC Hosting Entities by being trained 'on-the-job'.

This action builds on the successful pilot project "Digital Opportunity Traineeships", continued under Erasmus+ as part of the Digital Education Action Plan, and it will focus on highly specialised skills, notably in HPC for the first two years.

Scope: A consortium of different HPC actors would organise:

- a number of paid traineeships within their own organisations
- as a second stage, would organise paid traineeships to be allocated in other HPC organisations involved in the EuroHPC ecosystem who are not members of the consortium

- The traineeships are open to applicants under 40 year old, willing to work in Europe, as long as they have met all local immigration and labour laws in the countries of the EuroHPC JU Participating States. Trainees have to prove an interest in HPC technologies and applications. The traineeships will serve to train the next generation of HPC High level support staff to work in the private or public sector.

Outcome:

The action will contribute to bridge the gap between education and labour market, providing future HPC users across the EU with the opportunity to work in HPC environments, having access to the latest technological developments and valuable know-how. Each participant on this traineeship will be able to use HPC technologies and applications and find jobs in current and future sectors of the economy who use supercomputing.

Eligibility: A consortium made up of different actors in the European HPC sector who would organise traineeships in national HPC competence centres, companies, SMEs, European & EuroHPC Participating States Supercomputing Centres or a EuroHPC Hosting Entities. This consortium would:

- Identify traineeships opportunities in national HPC competence centres, companies, SMEs, European & EuroHPC Participating States Supercomputing Centres or a EuroHPC Hosting Entities
- Identify prospective candidates who are willing to participate in these traineeships
- Promote the action widely to ensure a minimum of 50 participants per annum
- Identify traineeships in competence centres, companies, SMEs or a EuroHPC Hosting Entities
- Identify prospective candidates who are willing to participate in these traineeships
- The consortium would place them in the HPC place of work for up to six months.
- The consortium would pay these trainees for the period of traineeship (this would include subsistence and accommodation)
- The consortium would also support the in-company expenses (tbc) that the training organisation incurs.

Specific conditions: CALLDIGITAL-EUROHPC-JU-2022-TRAINEESHIP	
Expected EuroHPC JU contribution per project	The EuroHPC JU estimates an EU Contribution from DEP SO4 of up to EUR 5 million for this action. Only one proposal is expected to be retained
Indicative budget	The total indicative budget for the topic is EUR 5 million.
Indicative Duration of the Action	4 years
Type of Action	Grant

Eligibility conditions	The conditions are described in General Annex B.

USER Forum Project

The JU will organise the first User Forum with support from INFRAG and RIAG. The User Forum will include participants from future users of HPCs. This meeting will inform EuroHPC JU in order for it to develop a policy document on a future 'User Forum' to be approved by the Governing Board in 2023. The first User Forum will also discuss the terms of reference on a pilot programme to be launched in 2022.

Furthermore, in order to allocate of Union's access time to the EuroHPC supercomputers requires the use of a fair and transparent peer review process, the JU will set up a web-based application for the submission of the different proposals to get access to the EuroHPC Supercomputers which is an integral part of the peer review process.

Indicative EU contribution for the topic is EUR 1 million and will be 100% funded by EU in 2023

C) ADMINISTRATION

Multi Annual Strategic Plan 2021-2027 (MASP)
The Multi Annual Strategic Plan 2021-2027 sets out the long-term strategy for the work of the JU will be reviewed by INFRAG and RIAG. Both Advisory Committees will review and propose amendments which will be considered by the Governing Board. The Governing Board may decide to incorporate these amendments into a revised MASP in 2023.

Communications
In 2022, the EuroHPC JU will continue to build its public image. The JU will do so by providing up-to-date information on its website, to announce its new calls, actions or achievements. The JU will further engage with the public at large by re-enforcing its press and social media activities and taking part in various public events.

In addition, the EuroHPC JU will specifically use some key highlights over the year to boost its public visibility:

- **Inauguration of the first EuroHPC pre-exascale supercomputers**

In 2022, the first two pre-exascale EuroHPC supercomputers will become operational. To celebrate this significant milestone, the EuroHPC JU will organise two inauguration ceremonies with the respective hosting entities:

a) in Finland, in June 2022 to inaugurate the supercomputer LUMI;
b) in Italy, to inaugurate the supercomputer LEONARDO in November 2022.

Both inaugurations will be high-level events, attended by national and EU officials and politicians. These events will be amongst the highlights of year for the public visibility of the EuroHPC JU.

In addition, due to COVID Pandemic, the Karolina inauguration took place virtually.

Two additional supercomputers will become operational in 2023 such as DEUCALION, the EuroHPC petascale supercomputer located in Portugal and MARE NOSTRUM 5 in Spain.

- **EuroHPC Summit week 2022**

The EuroHPC Summit Week (EHPCSW) is a major HPC event which brings together relevant European supercomputing stakeholders and decision makers, allowing them to share the latest technological developments, define synergies, express their current and future needs, and participate in shaping the future of European supercomputing. It allows the EuroHPC JU to present the latest developments, both from a political and from a technological point of view.

EuroHPC Summit Week (EHPCSW) 2022 will take place from 22 to 24 March 2022 in Paris, France.

The EHPCSW 2022 will be a very special and strategic edition as the first in-person edition since 2019 and organised in Paris during the French EU presidency. The EuroHPC JU will take advantage of this important event to showcase its achievements, present its new mandate and objectives as its upcoming activities and calls. The event will also be a key moment to strengthen the network of the EuroHPC JU.

- **Launch of first pan-European Master's programme in HPC**

Following the call for proposals EuroHPC-2020-03 "Training and Education on HPC", a consortium of European partners led by the University of Luxembourg has been selected by the EuroHPC JU to design and implement the first pan-European HPC pilot Master's programme. From Autumn 2022, the consortium will offer courses providing students with outstanding career perspectives in the rapidly expanding field of HPC. In coordination with the selected consortium, the EuroHPC JU will largely communicate on this concrete achievement to make known this new programme.

- **Support for communication and stakeholder outreach activities post 2022**

The EuroHPC JU will launch a call in 2022 to identify a service provider who will support the organisation of the EuroHPC Summit for the next 5 years. The service provider would also support the EuroHPC JU for various communication and outreach activities such as organisation of public events and production of communication materials (videos, visuals, interactive reports)

Indicative EU contribution for the topic is EUR 1 million and will be 100% funded by EU.

What for?

a) **EuroHPC Summit Week** in 2023 to gather the main European HPC stakeholders, showcase EuroHPC achievements and European HPC innovation, and raise awareness of the public image of the JU.
b) **Regular in-person meetings between key EuroHPC stakeholders** (RIAG, INFRAG, the Hosting Entities, R&I partners) to ensure efficient and coordinated collaboration and to develop synergies.
c) **Communication materials**
- Videos to support the JU during public events, on social media, and when engaging with the public

- Graphic support for webpage, social media and other external activities
- Interactive publications of JU reports such as the Annual Activity Report, the Systems Report. This will improve the attractiveness of the documents and will boost our website audience.

Commercial Access

The EuroHPC JU will procure in 2022 a study on user requirements with regards to commercial access of super computers. To do this, the EuroHPC JU will procure a study which will set out the market situation in Europe with regards to commercial use of supercomputing, market pricing for the use of access time including the supporting services provided. This study should also provide information comparing the market situation in third countries such the US, and China.

Legal

The JU is dependent on excellent legal support in order to do its work. It will procure, where necessary, external legal counsel to support it in implementing its operational activities. The JU will continue to defend the Lenovo versus EuroHPC JU case currently with the European Court of Justice.

IT and Office activities

With the growth of the JU and the subsequent recruitments, IT resources will grow accordingly. In addition, discussions will begin with the Luxembourg authorities to add new offices to the current ones in the Drosbach building.

Finance, audit and budgetary discharge

The JU will prepare to defend its first European Parliament discharge on 2020 activities.

D) BUDGET 2022

1. Revenue

In accordance with the provisions of the legal framework applicable to the EuroHPC JU, the contributors to the budget of the JU are defined in article 5, 6, 7 and 8 of Council Regulation (EU) 2021/1173.

The 2022 budget presented below now includes revenues allocated under Horizon 2020 and the new Multi Annual Programmes 2021-2027 which are Digital Europe Programme, Horizon Europe and Connected Europe Facility.

Table 1 Revenue Commitment Appropriations

Table 1: Revenue Commitment Appropriations					
			2022		
REVENUE (EUR)	**Approved Budget GB Dec. 26/2022**	**Re-activated credits from previous year (Amd. no. 1) GB Dec. No. 06/2022**	**Total Budget after Amd. no. 3 in GB Dec. 26/2022**	**Proposal for GB Dec. 33/2022**	**Total budget after Amd. no. 4 in 33/2022**
1. Revenue from Fees and Charges					
2. EU Contribution with EFTA included	**441.057.415,99**	**555.562.824,66**	**996.620.240,65**	**-**	**996.620.240,65**
of which Regulation (EU) 2021/1173 Administrative (Title 1 and Title 2) *	3.337.679,38		3.337.679,38		3.337.679,38
of which old Regulation (EU) 2018/1488 Administrative (Title 1 and Title 2)	1.740.965,29	3.006.679,51	4.747.644,80		4.747.644,80
of which Regulation (EU) 2021/1173 Operations (Title 3)	435.978.771,32	469.367.000,00	905.345.771,32		905.345.771,32
of which old Regulation (EU) 2018/1488 Operations (Title 3)		83.189.145,15	83.189.145,15		83.189.145,15
3. Third Countris Contribution	**-**	**-**	**-**	**-**	**-**
of which EEA/EFTA					**-**
supplementing Title 1 & 2					**-**
supplementing Title 3					**-**
of which Non-EEA					**-**
4. Other Contributions	**52.000.000,00**	**325.705.000,00**	**377.705.000,00**	**-**	**377.705.000,00**
Participating States					**-**
contribution to the procurement MN5, Leonardo & Lumi		75.705.000,00	75.705.000,00		75.705.000,00
PT contribution to procurement of petascale			**-**		**-**
contribution to the call of the high-end (exascle) supercomputer	**-**	250.000.000,00	250.000.000,00		250.000.000,00
contribution to the call of the quantum computers	52.000.000,00		52.000.000,00		52.000.000,00
Private Members					**-**
Total REVENUE (EU + 3rd Countries + Participating States Contributions	**493.057.415,99**	**881.267.824,66**	**1.374.325.240,65**	**-**	**1.374.325.240,65**
red = in WP 2021					
green = in WP 2022					
* The amount of €172.800 is excluded (SI2.865323 commitment done by CNECT to cover the REA experts)					

Table 2 Revenue Payment Appropriations

Table 2: Revenue Payment Appropriations	2022				
REVENUE (EUR)	Approved Budget GB Dec. 26/2022	Re-activated credits from previous year (Amd. no. 1) GB Dec. No. 06/2022	Total Budget after Amd. no. 3 in GB Dec. 26/2022	Proposal for GB Dec. 33/2022	Total budget after Amd. no. 4 in 33/2022
1. Revenue from Fees and Charges					
2. EU Contribution with EFTA included	407.004.905,45	99.713.513,20	506.718.418,65	-	506.718.418,65
of which Regulation (EU) 2021/1173 Administrative (Title 1 and Title 2) *	3.337.679,38		3.337.679,38		3.337.679,38
of which old Regulation (EU) 2018/1488 Administrative (Title 1 and Title 2)	1.740.965,29	2.975.493,34	4.716.458,63		4.716.458,63
of which Regulation (EU) 2021/1173 Operations (Title 3)	334.654.339,71		334.654.339,71		334.654.339,71
of which old Regulation (EU) 2018/1488 Operations (Title 3)	67.271.921,07	96.738.019,86	164.009.940,93		164.009.940,93
3. Third Country Contributions	-	-	-	-	-
of which EEA/EFTA					
supplementing Title 1 & 2					-
supplementing Title 3					-
of which Non-EEA					-
4. Other Contributions	75.004.569,18	83.917.695,68	158.922.264,86	- 35.884.839,60	123.037.425,26
Participating States Contributions					-
contribution to the procurement MN5, Leonardo & Lumi **	3.105.497,18	83.917.695,68	87.023.192,86	- 29.502.405,10	57.520.787,76
PT contribution to procurement of petascale	6.299.072,00		6.299.072,00	- 4.032.434,50	2.266.637,50
contribution to the call of the high-end (exascale) supercomputer	50.000.000,00		50.000.000,00	13.250.000,00	63.250.000,00
contribution to the call of the quantum computers	15.600.000,00		15.600.000,00	- 15.600.000,00	-
Private Members					-
Total REVENUE (EU + 3rd Country + Participating States Contributions	482.009.474,63	183.631.208,88	665.640.683,51	- 35.884.839,60	629.755.843,91

The amount of €172.800 is excluded (SI2.865323 commitment done by CNECT to cover the REA experts)

*** The amount of € 28.580.525 of PA (C2 Credits foreseen in 2020 to be paid by PS for the MN5) are now deducted as the Adm. Agreement was only signed in 2022 - PS will only contrbute in 2023*

Budget Expenditure

Titles 1&2:. The EU funding share to these appropriations will be released according to the JU needs during the period of 2022–2027. It will add up to EUR 92.000.000 – the amount foreseen in the EuroHPC Council Regulation. The currently available (and unspent) commitment credits will be re-activated in 2022 and the following years.

Title 3: The operational expenditure will be used for grants and procurement of the EuroHPC JU supercomputers. More details of pre-financing and interim payments can be found below.

Table 3: Expenditure Commitment Appropriations

COMMITMENT Appropriations (EUR)	Approved Budget GB Dec. 26/2022	Re-activated credits from previous year (Amd. no. 1) GB Dec. No. 06/2022	2022 Total Budget after Amd. no. 3 in GB Dec. 26/2022	Proposal for GB Dec. 33/2022	Total budget after Amd. no. 4 in 33/2022
Title 1. Staff Expenditure	**3.659.489,78**	**1.040.311,51**	**4.699.801,29**	**-**	**4.699.801,29**
11 Salaries & Allowances	3.124.000,00	730.003,77	3.854.003,77	-	3.854.003,77
of which Establishment plan posts	*1.936.717,83*	*121.422,65*	*2.058.140,48*		*2.058.140,48*
of which External personnel	*1.187.282,17*	*608.581,12*	*1.795.863,29*		*1.795.863,29*
12 Expenditure relating to recruitment	2.872,34	63.456,80	66.329,14		66.329,14
13 Mission and travel expenses	57.769,44	154.201,44	211.970,88		211.970,88
14 Socio-medical infrastructure and training	474.848,00	92.649,50	567.497,50		567.497,50
Title 2. Building, Equipment and Operating Costs	**1.419.154,88**	**1.966.368,00**	**3.385.522,88**	**-**	**3.385.522,88**
20 Buildings and associated costs	110.805,92	160.000,00	270.805,92		270.805,92
21 Information Technology	180.979,72	400.000,00	580.979,72		580.979,72
22 Movable property and associated costs	12.161,84	5.000,00	17.161,84		17.161,84
23 Current administrative expenditure	694.962,11		694.962,11		694.962,11
24 Postage and Telecommunications	6.080,92	26.368,00	32.448,92		32.448,92
25 Expenditure of formal and other meetings	212.832,15	600.000,00	812.832,15		812.832,15
26 Running costs in connection with operational activities	91.213,78	160.000,00	251.213,78		251.213,78
27 Information and Publishing	35.037,67	115.000,00	150.037,67		150.037,67
28 Expert contracts and meetings *	75.080,79	500.000,00	575.080,79		575.080,79
Total ADMIN (Tilte I and II)	**5.078.644,67**	**3.006.679,51**	**8.085.324,18**	**-**	**8.085.324,18**
Title 3. Operational Expenditure					
30 Grants, HPC Operations, R&I Activities	**299.000.000,00**	**6.999.999,03**	**305.999.999,03**	**- 11.000.000,00**	**294.999.999,03**
Regulation (EU) 2018/1488 Calls	*-*	*6.999.999,03*	*6.999.999,03*	*-*	*6.999.999,03*
EuroHPC-2019-1			-		-
EuroHPC-2019-2			-		-
EuroHPC-2019-3			-		-
EuroHPC-2020 -1			-		-
EuroHPC-2020 -2			-		-
EuroHPC-2020 -3		6.999.999,03	6.999.999,03		6.999.999,03
Opex Grants (LUMI, LEONARDO, MN5)					
Regulation (EU) 2021/1173 Calls	*299.000.000,00*	*-*	*299.000.000,00*	*- 11.000.000,00*	*288.000.000,00*
c. Federation Pillar	45.000.000,00		45.000.000,00		45.000.000,00
d. Technologies Pillar	135.000.000,00		135.000.000,00		135.000.000,00
e. Applications Pillar	50.000.000,00		50.000.000,00		50.000.000,00
f. Usage & Skills Pillar	64.000.000,00		64.000.000,00	- 11.000.000,00	53.000.000,00
g. International Cooperation Pillar	5.000.000,00		5.000.000,00		5.000.000,00
31 HPC Infrastructure Activities	**188.978.771,32**	**871.261.146,12**	**1.060.239.917,44**	**11.000.000,00**	**1.071.239.917,44**
Regulation (EU) 2018/1488	*-*	*151.894.146,12*	*151.894.146,12*	*-*	*151.894.146,12*
LUMI - PreExscale Supercomputer			-		-
LEONARDO - PreExscale Supercomputer			-		-
MNS5 - PreExscale Supercomputer		151.894.146,12	151.894.146,12		151.894.146,12
Deucalion - Petascale Supercomputer			-		-
Meluxina - Petascale Supercomputer			-		-
Regulation (EU) 2021/1173	*188.978.771,32*	*719.367.000,00*	*908.345.771,32*	*11.000.000,00*	*919.345.771,32*
High-end (Exascale) supercomputer		500.000.000,00	500.000.000,00		500.000.000,00
Midrange supercompters (1-3)	45.978.771,32	119.367.000,00	165.345.771,32	3.000.000,00	168.345.771,32
Hyperconnectivity for HPC Resources call		100.000.000,00	100.000.000,00		100.000.000,00
Upgrading EuroHPC supercomputers	33.000.000,00		33.000.000,00		33.000.000,00
Quantum computers	104.000.000,00		104.000.000,00		104.000.000,00
Access and allocation of EuroHPC computing resources and services	5.000.000,00		5.000.000,00	- 5.000.000,00	-
EuroHPC Summit 2023 + Communications	1.000.000,00		1.000.000,00		1.000.000,00
Energy Crisis Call *			-	12.000.000,00	12.000.000,00
User Forum *			-	1.000.000,00	1.000.000,00
Total OPERATIONAL (Title III)	**487.978.771,32**	**878.261.145,15**	**1.366.239.916,47**	**-**	**1.366.239.916,47**
TOTAL	**493.057.415,99**	**881.267.824,66**	**1.374.325.240,65**	**-**	**1.374.325.240,65**

* Energy Crisis call has replaced the "access and allocation of EuroHPC computing resources and services" - this call is postponed to 2023

Table 4: Expenditure Payment Appropriations

Table 4: Expenditure Payment Appropriations			2022		
PAYMENT Appropriations (EUR)	Approved Budget GB Dec. 26/2022	Re-activated credits from previous year (Amd. no. 1) GB Dec. No. 06/2022	Total Budget after Amd. no. 3 in GB Dec. 26/2022	Proposal for GB Dec. 33/2022	Total budget after Amd. no. 4 in 33/2022
Title 1. Staff Expenditure	**3.659.489,78**	**1.142.720,07**	**4.802.209,85**	**-**	**4.802.209,85**
11 Salaries & Allowances	3.124.000,00	739.897,45	3.863.897,45	-	3.863.897,45
of which Establishment plan posts	*1.936.717,83*	*121.422,65*	*2.058.140,48*		*2.058.140,48*
of which External personnel	*1.187.282,17*	*618.474,80*	*1.805.756,97*		*1.805.756,97*
12 Expenditure relating to recruitment	2.872,34	63.456,80	66.329,14		*66.329,14*
13 Mission and travel expenses	57.769,44	164.078,44	221.847,88		*221.847,88*
14 Socio-medical infrastructure and training	474.848,00	175.287,38	650.135,38		*650.135,38*
Title 2. Building, Equipment and Operating Costs	**1.419.154,88**	**1.832.773,27**	**3.251.928,15**	**-**	**3.251.928,15**
20 Buildings and associated costs	110.805,92	160.000,00	270.805,92		270.805,92
21 Information Technology	180.979,72	506.293,71	687.273,43		687.273,43
22 Movable property and associated costs	12.161,84	5.000,00	17.161,84		17.161,84
23 Current administrative expenditure	694.962,11	-	694.962,11		694.962,11
24 Postage and Telecommunications	6.080,92	26.000,00	32.080,92		32.080,92
25 Expenditure of formal and other meetings	212.832,15	360.479,56	573.311,71		573.311,71
26 Running costs in connection with operational activities	91.213,78	214.976,50	306.190,28		306.190,28
27 Information and Publishing	35.037,67	115.000,00	150.037,67		150.037,67
28 Expert contracts and meetings	75.080,79	445.023,50	520.104,29		520.104,29
Total ADMIN (Tilte I and II)	**5.078.644,67**	**2.975.493,34**	**8.054.138,01**	**-**	**8.054.138,01**
Title 3. Operational Expenditure					
30 Grants, HPC Operations, R&I Activities	**226.205.724,56**	**32.992.662,94**	**259.198.387,50**	**- 8.800.000,00**	**250.398.387,50**
Regulation (EU) 2018/1488 Calls	*19.624.784,85*	*32.992.662,94*	*52.617.447,79*	*-*	*52.617.447,79*
EuroHPC-2019-1	5.316.281,25		5.316.281,25		5.316.281,25
EuroHPC-2019-2	3.993.503,60	2.993.656,07	6.987.159,67		6.987.159,67
EuroHPC-2019-3	515.000,00	515.000,00	1.030.000,00		1.030.000,00
EuroHPC-2020 -1		4.310.564,37	4.310.564,37		4.310.564,37
EuroHPC-2020 -2		15.075.942,50	15.075.942,50		15.075.942,50
EuroHPC-2020 -3		5.600.000,00	5.600.000,00		5.600.000,00
Opex Grants (LUMI, LEONARDO, MN5)	9.800.000,00	4.497.500,00	14.297.500,00		14.297.500,00
Regulation (EU) 2021/1173 Calls	*206.580.939,71*	*-*	*206.580.939,71*	*- 8.800.000,00*	*197.780.939,71*
c. Federation Pillar	31.110.811,70		31.110.811,70		31.110.811,70
d. Technologies Pillar	85.870.128,01		85.870.128,01		85.870.128,01
e. Applications Pillar	38.400.000,00		38.400.000,00		38.400.000,00
f. Usage & Skills Pillar	51.200.000,00		51.200.000,00	- 8.800.000,00	42.400.000,00
g. International Cooperation Pillar	-		-		-
31 HPC Infrastructure Activities	**250.725.105,40**	**147.663.052,60**	**398.388.158,00**	**- 27.084.839,60**	**371.303.318,40**
Regulation (EU) 2018/1488	*57.051.705,40*	*147.663.052,60*	*204.714.758,00*	*- 33.534.839,60*	*171.179.918,40*
LUMI - PreExscale Supercomputer	4.062.504,83	61.120.645,30	65.183.150,13	- 1.878.887,80	63.304.262,33
LEONARDO - PreExscale Supercomputer	23.978.628,57	55.337.170,68	79.315.799,25	23.978.628,57	55.337.170,68
MNS5 - PreExscale Supercomputer *	22.711.500,00	28.580.525,00	51.292.025,00	- 3.644.888,73	47.647.136,27
Deucalion - Petascale Supercomputer	6.299.072,00		6.299.072,00	- 4.032.434,50	2.266.637,50
Meluxina - Petascale Supercomputer		2.624.711,62	2.624.711,62		2.624.711,62
EURO-IT4I - Petascale Supercomputer					-
Vega - Petascale Supercomputer					-
Dicoverer - Petascale Supercomputer					-
Regulation (EU) 2021/1173	*193.673.400,00*	*-*	*193.673.400,00*	*6.450.000,00*	*200.123.400,00*
High-end (exascale) supercomputer	100.000.000,00		100.000.000,00	13.250.000,00	113.250.000,00
Midrange supercompter(s) (1-3)	23.673.400,00		23.673.400,00	1.722.400,00	25.395.800,00
Hyperconnectivity for HPC Resources call	30.000.000,00		30.000.000,00		30.000.000,00
Upgrading EuroHPC supercomputers	8.600.000,00		8.600.000,00	1.300.000,00	9.900.000,00
Quantum computers	31.200.000,00		31.200.000,00	- 15.600.000,00	15.600.000,00
Access and allocation of EuroHPC computing resources and services	-		-		-
EuroHPC Summit 2023 + Communications	200.000,00		200.000,00	177.600,00	377.600,00
Energy Crisis Call **			-	4.800.000,00	4.800.000,00
User Forum ***			-	800.000,00	800.000,00
Total OPERATIONAL (Title III)	**476.930.829,96**	**180.655.715,54**	**657.586.545,50**	**35.884.839,60**	**621.701.705,90**
TOTAL	**482.009.474,63**	**183.631.208,88**	**665.640.683,51**	**35.884.839,60**	**629.755.843,91**

*the amount of € 28.580.525 of PA (C2 Credits foreseen in 2020 to be paid by PS for the MN5) are now deducted as the Adm. Agreement was only signed in 2022 - PS will only contrbute in 2023

*** Energy Crisis call has remplaced the "access and allocation of EuroHPC computing resources and services" - this call postponed for next year

*** this will be a procurement and not a grant

Table 5: Cash Flow Operational Budget – Title III

Table 5 Cash Flow - Operational Budget Title 3

5a) EUROHPC GRANTS - 3000

FY 2022	Type of payment*	2022 - C1 Credits
EFLOWS4HPC -H2020-JTI-EuroHPC-2019-1	IP	357.665,61
SCALABLE H2020-JTI-EuroHPC-2019-1	IP	141.533,33
LIGATE H2020-JTI-EuroHPC-2019-1	IP	261.206,09
ACROSS H2020-JTI-EuroHPC-2019-1	IP	399.911,59
OPTIMA H2020-JTI-EuroHPC-2019-1	IP	174.247,75
NextSim H2020-JTI-EuroHPC-2019-1	IP	188.470,46
DComEX H2020-JTI-EuroHPC-2019-1	IP	135.937,50
RED-SEA H2020-JTI-EuroHPC-2019-1	IP	399.685,50
IO-SEA H2020-JTI-EuroHPC-2019-1	IP	399.797,63
SPARCITY H2020-JTI-EuroHPC-2019-1	IP	130.273,63
DEEP-SEA H2020-JTI-EuroHPC-2019-1	IP	753.473,90
REGALE H2020-JTI-EuroHPC-2019-1	IP	330.929,26
eProcessor H2020-JTI-EuroHPC-2019-1	IP	399.998,75
ADMIRE H2020-JTI-EuroHPC-2019-1	IP	398.164,31
MAELSTROM H2020-JTI-EuroHPC-2019-1	IP	215.620,52
TIME-X H2020-JTI-EuroHPC-2019-1	IP	151.212,69
HEROES H2020-JTI-EuroHPC-2019-1	IP	32.834,67
EXAFOAM H2020-JTI-EuroHPC-2019-1	IP	240.180,46
TEXTAROSSA H2020-JTI-EuroHPC-2019-1	IP	205.137,64
EuroHPC-2019-1		**5.316.281,29**
951745 - FF4EUROHPC - H2020-JTI-EUROHPC-2019-2	IP	999.847,50
951740 - CASTIEL - H2020-JTI-EUROHPC-2019-2 -	IP	199.988,13
951732 - EUROCC - H2020-JTI-EUROHPC-2019-2	IP	2.793.667,94
EuroHPC-2019-2		**3.993.503,57**
946002 - MEEP - H2020-JTI-EUROHPC-2019-3	IP	515.000,00
EuroHPC-2019-3		**515.000,00**
LUMI - CSC OPERATING GRANT - EUROHPC JU	IP	5.005.000,00
LEONARDO- EUROHPC GRANT AGREEMENT WITH CINECA FOR PRE-EXACALE SUPERCOMPUTERS	IP	4.795.000,00
Total Opex Grants		**9.800.000,00**
Total Legacy		**19.624.784,85**
c6) High Level support Teams for EuroHPC systems	PP	4.000.000,00
c7) Federation of supercomputing and data resources call	PP	27.110.811,70
d8) HPC Open Hardware Technologies (Risk V)	PP	51.270.128,01
d9) HPC Open Software Stack Technologies	PP	34.600.000,00
e10) Centres of Excellence	PP	34.500.000,00
e11) New algorithms for applications on European exascale supe	PP	3.900.000,00
f12) HPC Competence Centres	PP	32.000.000,00
f13) Networking and coordination of national HPC Competence	PP	2.400.000,00
f16) Digital Opportunity Traineeships project	PP	8.000.000,00
Regulation (EU) 2021/1173 Calls		**197.780.939,71**
Total		**217.405.724,57**

* IP - Interim Payments, PP - Pre-financing

5b) EUROHPC INFRASTRUCTURE Activities (3100)

FY 2022	Type of payment*	2022 - C1 Credits	
		EU Contribution	PS Contribution
LUMI - PreExscale Supercomputer	maintenance		2.183.617,08
LUMI - PreExscale Supercomputer	IP / FP		
LEONARDO - PreExscale Supercomputer	IP		
MN5 - PreExscale Supercomputer	PP	47.647.136,27	
DEUCALION - Petascale Supercomputer	IP		2.266.637,50
Regulation (EU) 2018/1488		*47.647.136,27*	*4.450.254,58*
High-end (Exascale supercomputer) (2) - 1 in 2022	PP	50.000.000,00	63.250.000,00
Midrange supercompter (1-3)	PP	25.395.800,00	
Hyperconnectivity for HPC Resources call	PP	30.000.000,00	
Upgrading EuroHPC supercomputers - between 2022 and 2027	PP	9.900.000,00	
Quantum computers	PP	15.600.000,00	
EuroHPC Summit 2023 + Communications	PP	377.600,00	
Energy Crisis Call	PP	4.800.000,00	
f14) USER Forum Project	PP	800.000,00	
Regulation (EU) 2021/1173		*136.873.400,00*	*63.250.000,00*
Total EU Contribution/ PS Contribution		**184.520.536,27**	**67.700.254,58**
Total			**252.220.790,85**

2. Information of the use of EuroHPC JU financial resources

a) Title 1: Staff Expenditure

Chapter 11 – Salaries and Allowances

The Joint Undertaking will organise the recruitment of new staff and cover the salaries, social security and other related allowances of staff in place. This appropriation is to cover the remuneration cost of establishment plan posts (temporary staff) and external personnel (contract staff, Seconded National Experts, interim), in accordance with the Staff Regulations.

It includes the cost for basic salaries, promotions, family allowances, expatriation and foreign residence allowances. It is also intended to cover the employers' social security contributions, insurance against sickness, accidents and occupational disease, unemployment insurance, birth and death allowances, annual travel costs from the place of employment to the place of origin, in accordance with the Staff Regulations of Officials of the European Union and the Conditions of Employment of Other Servants of the Union. This chapter also covers the costs for the SLA signed with PMO which is the Commission organisation that handles salaries and staff benefits.

Chapter 12 – Expenditure relating to recruitment

This appropriation will cover the expenditure arising from the search for suitable candidates (publishing vacancies) and subsequent administration costs of the recruitment of new staff members (installation, resettlement and daily subsistence allowances, removal and travel expenses).

Chapter 13 – Mission and travel expenses

As part of its duties and once the sanitary situation permits, the staff of the Joint Undertaking will have to travel to various conferences, meetings and workshops related to the activities of the Joint Undertaking and to the actions funded. The mission appropriation is to cover travel expenses, daily subsistence allowances and ancillary or exceptional expenditure incurred by statutory staff in the interest of the service.

Chapter 14 – Socio-medical infrastructure and Training

This appropriation is intended to cover the costs of the annual medical check-up of staff and associated analyses required, complementary health insurance and schooling allowances. This chapter also covers the cost for training of staff and the SLAs signed with the Commission's DG HR.

b) Title 2: Building, Equipment and Operating Costs

Chapter 20 – Buildings and associated costs

The JU has to ensure that the working conditions of its staff comply with the standards of the EU institutions. The office premises are provided by the JU hosting country. This appropriation includes costs

related to the infrastructure including insurance, water, electricity and heating, cleaning and maintenance, security and surveillance. The SLA from OIL is also covered in this chapter.

Chapter 21 – Information Technology

To allow its staff to perform its work, especially now that activities will be undertaken both virtually and physically, the Joint Undertaking is equipped with state-of-the-art and where possible hybrid office equipment and networking facilities, allowing to use the standard IT toolchain of the EU programmes provided by the EU institutions. This appropriation is intended to cover the purchase of computing and other similar electronic office equipment and hardware as well as the installation, configuration and maintenance of this equipment. The procurement and maintenance of programme packages and software licences necessary for the normal operation of the JU, the expenditure on services contracts for analysis, programming and technical assistance necessary for the JU, the cost of external services contracts to manage and maintain the data and systems, training and other support activities.

It covers the cost of SLAs with a number of Commission departments, necessary for the provision of IT equipment/services (SLA with the Commission DGs: DIGIT, REA, RTD and/or CNECT) to allow for the smooth running of the JU. It also includes costs specific to the secure data communication needs of the JU and to access the JU's accounting and auditing systems.

Chapter 22 – Movable property and associated costs

This chapter includes the necessary resources to cover the costs of office organisation, archive spaces and meeting rooms.

Chapter 23 – Current administrative expenditure

This chapter includes costs of office supplies, stationery, badges, office material and other consumables necessary for the operation of the office as well as any costs incurred for any mandatory translations) In this chapter are covered the costs related to the SLAs signed with Centre de Traduction (CdT) and the costs for the SLA with signed DG BUDG.

Chapter 24 – Postage and Telecommunications

This chapter covers all correspondence, postage, delivery services and telecommunication (fixed, mobile telephony and videoconference equipment/licencing) costs of the JU.

Chapter 25 – Expenditure of formal events and other meetings

When the sanitary situation improves, and as part of the activities of the Joint Undertaking, some meetings (like Governing Board meetings and community workshops) are likely to require conference facilities that are not available at the JU premises. These appropriations will finance meetings that will take place inside or outside of the JU premises. Funds will also be used to prepare the 'access' policy implementation activities.

Chapter 26 – Running costs in connection with operational activities

Auditing and legal assistance are key elements to ensure that the JU complies with the legal framework. This appropriation is covering all audit related expenditure: the costs for internal audit capability, external auditors and ex-post audits.

In addition, the communication policy of the Joint Undertaking is an important element to ensure public awareness and understanding of the programme. This appropriation will also cover the activities related to communications and publications, and in particular:

- Communication material for conferences, info days and workshops,

- Website development and consolidation,

- General public relations and publicity.

Chapter 27 – Information, Studies and Publishing

This appropriation is intended to cover costs of the communication activities of the Joint Undertaking, to ensure public awareness and understanding of the scopes. It is also covering the activities related to production and printing the Annual Activity and other Reports. It will cover the costs of studies that the JU may wish to undertake.

Chapter 28 – Expert contracts and meetings

This chapter includes the costs related to the evaluation, selection and review of projects, as well as the costs incurred for evaluators and reviewers.

c) Title 3: Operational Expenditure

The main purpose of the Joint Undertaking is the indirect implementation of EU budget in the field of High Performance Computing. Detailed description of the operational activities undertaken in 2021 are presented in the Work Plan below.

Chapter 30 – Grants, R&I Activities

Table 5 on page 16 sets out contributions made to HPC Grants (R&I) established under Regulation 2018/1488 and Regulation 2021/1173 in 2022.

Chapter 31 – HPC Infrastructure Activities

In 2022, this appropriation is related to the final acquisition costs of the three precursor to exascale supercomputers and petascale supercomputers that remain to be built and/or have received their acceptance. Supercomputer maintenance are also foreseen to be paid annually from 2022 (depending on final acceptance date). In addition, it will also include appropriations related to the acquisition of the medium range and exascale supercomputers. Table 5 above sets out contributions made to HPC Infrastructure activities established under Regulation 2018/1488 and Regulation 2021/1173 in 2022.

Hyper connectivity for HPC resources

Following the conclusion of the preparatory phase, the EuroHPC JU will prepare a call to be agreed by the Governing Board.

Precursors to exascale supercomputers

As the EuroHPC JU will be the owner of the pre-exascale supercomputers it procures, the Participating States will transfer to the EuroHPC JU their share to match the financing paid by the EuroHPC JU. The installation of the precursor to exascale supercomputers is ongoing.

LUMI: will be financed on the basis of several milestones in 2021 and final payment (50% of set-up) planned for 2022.

LEONARDO: prefinancing of 30% of set-up took place in 2020, a delivery payment (20% of set-up) and acceptance payments (50% of set-up) are planned in 2022.

Mare Nostrum 5: The JU will launch a new open procurement procedure before the end of 2021. The award of the contract will take place in 2022 and we expect a prefinancing of 30% of set-up planned in 2022, a delivery payment (20% of set-up) and an acceptance payments (50% of set-up) in 2022

Petascale supercomputers

The installation of all five petascale supercomputers is planned to be completed by the end of 2022.

The JU will own 35% of the four other Petascale supercomputers (LU, BG, SI, CZ) and are run by the Hosting Entities who own up to 65% of these Petascale machines.

Following the explicit request of Portugal, this petascale supercomputer was procured by the Joint Undertaking. As the EuroHPC JU will become the owner of this supercomputer, the appropriation includes not only EU funding but also the Participating State's share (13.224.072€). The operating costs of this supercomputer will be covered by the Hosting Entity from 2022 onwards.

E) HUMAN RESOURCES

The Staff establishment plan gives an overview and forecast of annual staff positions for 2022-2027, taking into account the new Council Regulation of 2021/1173 of 13 July 2021 stablishing EuroHPC JU and repealing the Regulation of 2018. The estimation of the cost of human resources is based on the total average cost.

With the entry into force of the new Regulation, the main focus of the Human Resources in 2022 will be on the recruitment and integration of the newcomers in the team, as well as enhancing team cohesion within new re-organised JU. In view of the future growth, the organization needs a solid structure, in order to ensure both the efficiency and effectiveness of its operations.

The implementation of the HR tools, policies and procedures, in line with the Implementing Rules adopted by the Governing Board will continue. Effort will be made to strengthen the existing and develop new

competencies. As the team grows, relevant training offer will be determined for different groups of staff. Efforts will also be made to stimulate interaction and knowledge sharing between colleagues, as well as maintain good team spirit.

Priorities for the 2022 recruitments:

The recruitment for the "priority posts", determined on the basis of the business continuity, business needs and recommendations of European Court of Auditors, started in 2021, following the adoption of the 2021 establishment plan by the Governing Board. The following posts have been identified as priority: HR Assistant, Programme Officers, IT Officer, Internal Control and Audit Officer, Financial Assistant, Legal Officer.

Human resources planning for the period of 2022-2027:

	2021	2022	2023	2024	2025	2026	2027
Establishment plan posts: TA	4	22	27	27	27	27	27
Total establishment plan posts	4	22	27	27	27	27	27
Contract Agents	11	25	27	27	27	27	27
Seconded National Experts	1	0	0	0	0	0	0
Total Staff*	16**	47	54	54	54	54	54

***Reduction in total staff from 2023 (adoption of the Chip Act)*

** Posts allocated under Regulation (EU) 2018/1488

Breakdown of Temporary Staff by grade in 2021 and 2022

Category and grade	2021*	2022
	TA	TA
AD 16		
AD 15		
AD 14	1	1
AD 13		

AD 12		1
AD 11		
AD 10	1	2
AD 9		1**
AD 8	2	13
AD 7***		2
AD 6		1
AD 5		
Total AD	4	21
AST 4	0	1
Total AST/SC	0	1
TOTAL	4	22

*By the end of 2021, all Temporary Agent posts allocated under Regulation (EU) 2018/1488 have been filled

** Modification based on art. 38 of the COMMISSION DELEGATED REGULATION (EU) 2019/715 of 18 December 2018 on the framework financial regulation for the bodies set up under the TFEU and Euratom Treaty and referred to in Article 70 of Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council

*** *POs - entry into service to date*

Breakdown of external staff by Function Group in 2021 and 2022

External Personnel – Contract Agents	2021*	2022
Function Group IV	5	9
Function Group III	4	13
Function Group II	2	3
SNE	1	0
Total Staff	12	25

* By the end of 2021, all Contract Agent posts allocated under Regulation (EU) 2018/1488 have been filled except for the SNE post, which was discontinued from 2022 onwards

Organisation Chart of the EuroHPC JU – 2022

Organisation chart of the EuroHPC JU
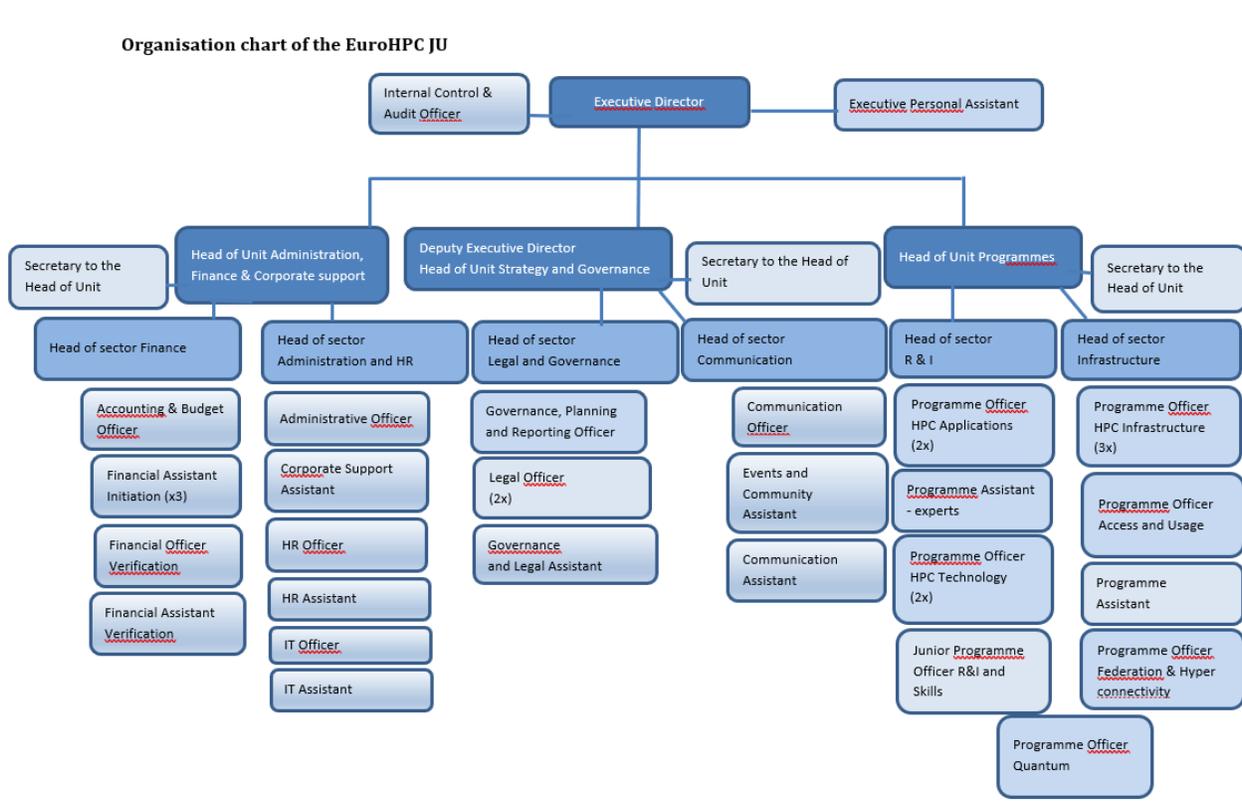
Executive Director

The Executive Director is the chief executive responsible for the day-to-day management of the EuroHPC Joint Undertaking, providing leadership at the strategic and operational level ensuring the achievement of the Joint Undertaking's objectives. The Executive Director is its legal representative and performs his tasks with independence. He is accountable to the Governing Board.

Executive Personal Assistant – VACANT

The Executive Secretary provides the secretarial support to the Executive Director, and the Deputy Executive Director. She/he organises the activities of the Executive Director's Office. She/he provides administrative support in relations with the ED and Deputy ED's external meetings. She/he does the general coordination with the JU Units of tasks which concern the whole JU such as meeting organisation, support to the Governing Board, document management etc. She/he registers and dispatches the incoming correspondence for the ED office.

Internal Control and Audit Officer - VACANT

The Internal Control and Audit Officer provides advice on risk management and internal control and ensures that risks are appropriately and continuously identified and managed.

She/he maintains and keeps up to date the Internal Control System of the JU. She/he evaluates the effectiveness of the internal control strategy and related system and provides advice to the management on improving the sound financial management and compliance.

She/he acts as a coordinator of risk assessment process, provides advice and guidance on the implementation of corrective/preventive actions and contributes to defining, maintaining and improving of the JU's procedures, processes and systems, in collaboration with different units.

She/he acts as contact point and coordinator with regard to the implementation of the internal audit function. She/he coordinates of audit implementation with all the relevant actors, monitors the audit reporting and the implementation of audit plan in view of audit related KPIs and follows-up on the implementation of the audit/findings/Action plan.

She/he draws up the annual audit plan of the internal audit capability taking into consideration inter alia the Executive Director's assessment of risk in the JU.

Deputy Executive Director and Head of Unit Strategy and Governance - VACANT

The Deputy Executive Director supports the Executive Director in his work and decisions. She/he acts on behalf of the Executive Director during his absence. She/he supports the Executive Director in day-to-day management and overall coordination of the JU.

In his/her capacity as the Head of Unit, she/he oversees the governance, legal, strategic coordination, stakeholders relations and communication activities of the JU. She/he ensures supports the ED in the coordination of the Governing Board and other Advisory Committees, ensuring the optimal outreach of the JU messages, as well as the dissemination of results, in line with JU's objectives. She/he oversees the governance aspects of the JU and relations with stakeholders. The HoU oversees the planning and reporting of the JU, as well as the activities of the legal team which include procurement activities and support to the Operational teams in the JU. She/he coordinates the preparation of the Annual Strategic Plans and the Multi-Annual Strategic Plans.

Secretary to the Head of Unit

The Secretary to the Head of Unit provides the secretarial support to the Unit. He assists the Head of Unit with ensuring the follow-up and respect of deadlines in the Unit activities. He coordinates the document management of the Unit, assists in preparation of missions, prepares / copies documents for transmission and maintains files, provides administrative and logistical support for the organisation of internal and external events such as meetings, workshops, conferences and public events; participates in the planning of logistical needs of the unit.

Head of Sector Legal and Governance - VACANT

The Head of Sector Legal and Governance coordinates the day-to-day work of the team. She/he coordinates the legal advice in all aspects related to the functioning of the JU, such as procurement, HR, governance etc. She/he oversees the documentation related to the grants and procurement procedures, as well as governance of the JU. She/he contributes to JU reporting documents.

Governance, Planning and Reporting Officer - VACANT

The Governance, Planning and Reporting Officer manages the secretariat of the Governing Board of the JU. She/he plans and organizes meetings of the Governing Board, including all required documentation and voting procedures. She/he works with the legal team on all Decisions of the GB and other legal or procedural documents.

She/he coordinates drawing up of the key planning and reporting documents of the JU, such as the Annual Activity Reports. She/he provides input into the Annual Work Programmes.

She/he provides input into the definition of JU's objectives and performance monitoring tools. She/he monitors progress in planning and programming and reports on it. She/he ensures systematic monitoring and follow-up of strategic decisions and actions.

Legal Officer

The Legal Officer provides the Executive Director and the JU Team with all relevant legal advice and support for the smooth operation of the activities of the JU, monitors the implementation of contractual obligations of the JU, drafts legal documents of the JU and is the JU's Data Protection Officer. She assists in the implementation of the staff policy and ensures compliance with EU and JU rules and regulations. She supports the Planning and Reporting Officer in preparing decisions for the Governing Board. She supports the Operational teams on legal aspects of procurement and grants. She provides liaises with external lawyers (where required) and provides input to the legal procedures and litigations.

Legal Officer

The Legal Officer provides advice on the legality and compliance of the grant agreements and procurement procedures. She/he supports Programme Officers and other units in drafting tender documents (invitations to tender, technical specifications, contracts). She/he provides support for contract activities including drafting and reviews of contract and amendment templates.

She/he contributes to preparation of manuals, vade-mecums and internal procedures. She/he provides legal advice related to the implementation of procurement contracts and grant agreements.

Governance and Legal Assistant - VACANT

Governance and Legal Assistant provides support with updating templates, checklists, and any other documents related to the procurement and Model Grant Agreement cycles. She/he supports the

communication with the members of the JU's Governing Board, assist in preparation of the supporting documents, and oversees the correspondence, including invitations, voting etc.

She/he creates templates and repository of legal advice and supports the team with drafting replies to new requests. She/he supports Programme Officers in performing administrative verification of received offers.

Head of Sector Communication – VACANT

The Head of Sector coordinates the work of the sector. She/he supports the Head of Unit in defining effective communication policy and strategy, in order to increase the visibility and positioning of JU as an important actor in the HPC ecosystem. She/he will oversee the design and implementation of communication campaigns, press relations and events.

She/he oversees the production of online and offline materials to convey and disseminate key messages of the JU. She/he will support the Head of Unit in providing relevant KPIs and other data demonstrating that the objectives of the JU are reached. She/he ensures adequate outreach and dissemination of information related to the JU's initiatives and results.

Communication Officer

The Communication Officer is responsible for the JU's communication, press activities, including managing the JU website, developing and overseeing the execution of a communications activity plan implementing the Communications Strategy of the JU. She is responsible for media relations. In collaboration with the Programme Officers and Director's Office, she/he reports on the HPC projects and procurement stories and best practice.

Events and Community Assistant - VACANT

The Events and Community Assistant supports the organization of internal and external meetings and events and community-building activities of the JU. In collaboration with the Programme Officers and Director's Office, she/he identifies the speaking opportunities for the JU representatives at external events and coordinates JUs presence at such events.

She/he works closely with other units, in particular the Programmes Unit, in order to deliver on the stakeholder needs and position the JU as an important actor of the HPC community.

She/he assists other team members in providing the tools and platforms supporting effective communication and community building, such as newsletters, online discussion fora, expert groups, networking events etc.

Communication Assistant

The Communication Assistant supports the team in the implementation of the communication strategy, and in particular drafting texts, information gathering, press monitoring and dissemination of clippings,

managing social media, providing input to newsletters etc., maintaining databases of press contacts, preparation of contracts for external support to organise events such as EuroHPC Summit. She/he supports the team in the organization of internal and external events.

Head of Unit Programmes - VACANT

The Head of Programmes is central to the implementation of the JU's Programmes, overseeing the work the procurement and R&I activities. She/he seeks to enhance the quality, efficiency and effectiveness of the programmes managed by the JU, overseeing the work performed within the projects implementing the JU Programme to achieve its objectives. She/he gives scientific and technical direction to the unit and coordinate the scientific input of the JU's Advisory Boards into the planning activities of the JU. She/he provides direction to the Programmes Unit and its staff including the HR management aspects.

Secretary to the Head of Unit - VACANT

The Secretary to the Head of Unit provides the secretarial support to the Unit. She/he assists the Head of Unit with ensuring the follow-up and respect of deadlines in the Unit activities. She/he coordinates the document management of the Unit, assists in preparation of missions, prepares / copies documents for transmission and maintains files, provides administrative and logistical support for the organisation of internal and external events such as meetings, workshops, conferences and public events; participates in the planning of logistical needs of the unit.

Head of Sector R & I

The Head of Sector coordinates the activities related to the R & I. He provides input to the yearly Work Programme. He coordinates the work of the team in the R&I sector.

He organises and is involved in the evaluation of proposals (selection of experts, logistics etc.), manages the process of selection of projects, monitors and reviews the execution of grant agreements, carries out project reviews and ensures compliance with the prevailing rules and regulations. He works with the other Programme Officers and also negotiates strategic, scientific, managerial and financial aspects of research contracts and amendments.

He liaises with relevant JU stakeholders and communities of experts.

Head of Sector Infrastructure

The Head of Sector coordinates the activities related to the Infrastructure. He provides input to the yearly Work Plan. He coordinates the work of the team in the Infrastructure sector.

He organises and is involved in the evaluation of public tenders (publication, opening, selection of experts, logistics etc.), manages the selection process, monitors and reviews the execution of associated contracts, monitors the allocation of supercomputer access times and ensures compliance with the prevailing rules and regulations.

He liaises with relevant JU stakeholders and communities of experts.

Programme Officer HPC Infrastructure –3 posts – 2 VACANT

The Programme Officer organises and is involved in the evaluation of public tenders (publication, opening, selection of experts, logistics etc.), contributes to the development of tender and technical specifications, manages the selection process, monitors and reviews the execution of associated contracts, monitors the allocation of supercomputer access times and ensures compliance with the prevailing rules and regulations.

She/he liaises with relevant JU stakeholders and communities of experts.

Programme Officer Federation & Hyper connectivity - VACANT

The Programme Officer organises and is involved in the evaluation of public tenders (publication, opening, selection of experts, logistics etc.), manages the selection process, monitors and reviews the execution of associated contracts, monitors the allocation of supercomputer access times and ensures compliance with the prevailing rules and regulations.

The PO F&H contributes to the Federation and Hyperconnectivity pillar of the JU overviewing the implementation of actions and policies necessary to establish the relevant services within the pan-European HPC infrastructure deployed and operated by the JU.

Programme Officer Access and Usage – VACANT

The Programme Officer organises and is involved in the definition and implementation of the EuroHPC JU Access Policy. He aids in the definition of the various calls for Access published by the JU and the implementation of the various Peer-review processes and evaluations organized as part of the Access Policy implementation. She/he monitors the allocation of supercomputer access times, ensures compliance of the Hosting Entities activities in terms of access provision and user support as defined in the respective Hosting Agreements.

Programme Assistant – VACANT

The Programme Assistant provides support to the implementation of the JUs programme management activities, such as evaluation of proposals for R&D grants and public tenders, grant preparation, monitoring the technical execution of the grants and provides any technical support to the Programme Officers. She/he also supports the auditing activities including KPIs related to grants and procurement activities and ensures compliance with applicable rules and regulations.

She/he provides administrative support to the Programme Officers.

Programme Officer Quantum Computing - VACANT

The Programme Officer organises and is involved in the evaluation of public tenders (publication, opening, selection of experts, logistics etc.), and grants, manages the selection process, monitors and reviews the execution of associated contracts, monitors and reviews the execution of grant agreements, carries out project reviews and ensures compliance with the prevailing rules and regulations.

The PO Quantum contributes to the delivery of strategic goals and the implementation of mandate of the JU in what concerns the development of Quantum technologies and the procurement and deployment of Quantum computers in Europe.

Programme Officer HPC Applications - 2 posts - 2 VACANT

The Programme Officer organises and is involved in the evaluation of proposals (selection of experts, logistics etc.), manages the process of selection of projects, with the prevailing rules and regulations. She/he works with the other Programme Officers and also negotiates strategic, scientific, managerial and financial aspects of research contracts and amendments.

Programme Officer HPC Technology – 2 posts – 1 VACANT

The Programme Officer organises and is involved in the evaluation of proposals (selection of experts, logistics etc.), manages the process of selection of projects, monitors and reviews the execution of grant agreements, carries out project reviews and ensures compliance with the prevailing rules and regulations. She/he works with the other Programme Officers and also negotiates strategic, scientific, managerial and financial aspects of research contracts and amendments.

Junior Project Officer

The Junior Project Officer organises and is involved in the evaluation of proposals (selection of experts, logistics etc.), manages the process of selection of projects, monitors and reviews the execution of grant agreements, carries out project reviews and ensures compliance with the prevailing rules and regulations. She/he works with the other Programme Officers and also negotiates strategic, scientific, managerial and financial aspects of research contracts and amendments.

Programme Assistant – experts

The Programme Assistant – experts supports the team in all aspects related to experts' management: selection, communication and planning, contract preparation, reimbursement of costs, payments etc.

She/he supports the Programme Officers in the logistical aspects of the organization of evaluation panels.

Head of Unit Administration, Finance and HR – VACANT

The Head of Administration is responsible for managing the human and financial resources of the JU according to the principle of sound financial management and in compliance with underlining regulations.

She/he will also be responsible for implementing internal controls aiming at providing reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance.

She/he contributes to the development of the budgetary and financial resource management procedures of the JU. She/he ensures the follow-up of recommendations issued by the IAS and the Court of Auditors. She/he ensures the effective management of the IT infrastructure and specific applications needed to support the activities of the JU

Secretary to the Head of Unit

The Secretary to the Head of Unit provides the secretarial support to the Unit. She assists the Head of Unit with ensuring the follow-up and respect of deadlines in the Unit activities. She coordinates the document management of the Unit, assists in preparation of missions, prepares / copies documents for transmission and maintains files, provides administrative and logistical support for the organisation of internal and external events such as meetings, workshops, conferences and public events; participates in the planning of logistical needs of the unit.

Head of Sector Administration and HR – VACANT

The Head of Sector Administration and HR coordinates the logistical, administrative, human resources and IT/infrastructure aspects of the JU operations. She/he coordinates the work of the team. She/he ensures that measures are in place to provide a safe working environment, tailored to the JU's business needs and compliant with applicable rules and requirements. She/he oversees the recruitment, training and wellbeing of JU staff, stimulating the collaborative working methods and team spirit.

She/he ensures that the adequate tools and procedures are in place, in order to guarantee the efficiency of administrative processes and effective functioning of the JU.

Administrative Officer

The Administrative Officer maintains the Unit activity plans and ensures follow-up and respect of deadlines of the JU activities, provides support to the activities of the Governing Board, contributes to administrative quality checks on files for signature, participates in the planning of JU's infrastructure and logistics needs.

He implements relevant Service Level Agreements and framework and other procurement contracts, ensuring effective and efficient operations of the JU.

Corporate Support Assistant – VACANT

Corporate Support Assistant supports the Administration and HR Unit in preparation and implementation of relevant contracts and agreements, such as SLAs and Framework and other procurement contracts with external service providers/suppliers.

She/he is involved in office supplies planning, in coordination with other units. She/he supports Unit in organization of internal events.

She/he will liaise with building administration and other internal and external services in order to ensure compliance with applicable Health & Safety rules. She/he provides support to the organization of the office move and preparation of the office space for newcomers.

HR Officer

The HR Officer is responsible for the design and implementation of the Human Resources Management strategy and the HR policies and procedures of the JU, in line with applicable rules and regulations and JU's mission and objectives.

She implements the necessary IT tools, related to Human Resources Management. She organizes initiatives aiming at ensuring staff well-being.

HR Assistant

The HR Assistant supports the HR Officer in recruitment and selection procedures and day-to-day Human Resources Management, including HR personnel files, learning and development, SYSPER (leave manager).

She/he manages relevant HR functional mailboxes and ARES files.

IT Officer - VACANT

The IT Officer provides appropriate definition of requirements, implementation of policy and maintenance of the ICT infrastructure and service of the JU. She/he contributes to the preparation of the budget and provides IT-related input into JU's activity reports.

The IT Officer oversees the management of the IT infrastructure of the JU, ensuring compliance with applicable rules and requirements. She/he monitors to correct operation of the systems, ensuring that the IT systems respond to business needs.

She/he plans the hardware and software needs of the JU and ensures their timely procurement.

IT Assistant

IT Assistant is responsible for the day-to-day management of IT and Telecommunication Systems of the JU. He provides help-desk assistance to JU staff. He supports the IT Officer in preparation of contracts and purchase orders, in order to ensure that the JU's IT needs are met.

He provides input into the budgetary planning and reporting.

Head of Sector Finance – VACANT

She/he leads a team of financial officers and assistants, contributing to the sound implementation of the JU's administrative and operational budget, compliant with EC Financial Regulation and ensures overall coordination with the other actors of the financial circuits. She/he oversees the financial procedures and circuits and model documents.

She/he provides input to budgetary planning and contributes to the design, implementation and evaluation of the JU's control mechanisms and fraud prevention.

Accounting & Budget Officer

The Accounting & Budget Officer monitors that the JU is complying with the applicable EU financial and accounting rules, is the interface with the EC Accountant (DG BUDG), provides advice and recommendations to improve the efficiency, effectiveness and financial management of the JU.

She prepares annual budgetary and financial accounts and monitors budget execution. She contributes to the preparation of the Annual Activity report, including the corresponding costs. She prepares and manages reporting on budgetary and general accounts. She contributes to the development and implementation of financial procedures and the elaboration and updating of model documents.

Financial Assistant Initiation – 3 posts

The Financial Assistant is responsible for the financial initiation with regard to administrative and operational expenditure (budget, procurement and grants) of the JU. She/he ensures the financial and administrative compliance of the grants and contracts, performs the administrative quality checks on files for signature, monitors the operational and administrative expenditures.

She/he provides support in the preparation, planning, reporting, forecast and follow-up of the budget.

Financial Officer Verification - VACANT

The Financial Officer verifies the financial and administrative compliance of the grants, contracts and procedures, performs the administrative quality checks on files for signature, monitors the operational and administrative expenditures. She/he performs ex-ante verification of commitments, payments and recovery orders. She/he ensures legality and regularity by verifying the respect of Financial Regulation and other related rules and budgetary dispositions.

She/he contributes to the JU's risk assessment annual exercises and the review of financial circuits, and works with the Audit Manager to ensure the implementation of the Internal audit and other activities linked to management of risk and prevention of fraud.

Financial Officer Verification

The Financial Assistant supports the verification of the financial and administrative compliance of the grants, contracts and procedures, performs the administrative quality checks on files for signature, assists in monitoring the operational and administrative expenditures. She/he supports the process of ex-ante

verification of commitments, payments and recovery orders. She/he ensures legality and regularity by verifying the respect of Financial Regulation and other related rules and budgetary dispositions.

[1] *OJ L 256, 19.7.2021, p. 3–51*

[2] This corresponds to the budget envelope indicated in the Call for Expression of Interest in the EuroHPCWP2021

[3] This corresponds to the budget envelope which is indicative and may appear in the 2023 Work Programme.

[4] This corresponds to the budget envelope indicated in the Call for Expression of Interest in the EuroHPCWP2021

[5] This corresponds to the budget envelope indicated in the Call for Expression of Interest in the EuroHPCWP2021

[6] Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.

[7] Regulation (EEC, Euratom, ECSC) No 259/68 of the Council of 29 February 1968 laying down the Staff Regulations of Officials and the Conditions of Employment of Other Servants of the European Communities and instituting special measures temporarily applicable to officials of the Commission (OJ L 56, 4.3.1968, p. 1).