



EuroHPC JOINT UNDERTAKING
DECISION OF THE GOVERNING BOARD OF THE EuroHPC JOINT
UNDERTAKING No 7/2018
Adopting the Joint Undertaking's Work Plan for the year 2019

THE GOVERNING BOARD OF THE EuroHPC JOINT UNDERTAKING,

Having regard to Council Regulation (EU) 2018/1488 of 28 September 2018 establishing the European High Performance Computing Joint Undertaking (hereinafter "Regulation")¹,

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

HAS ADOPTED THE FOLLOWING DECISION:

WHEREAS

- (1) The Executive Director should prepare and submit to the Governing Board for adoption a draft annual work plan which shall include the research and innovation activities, the procurement activities, the administrative activities and the corresponding expenditure estimates.
- (2) The work plan should be adopted by the end of the year prior to its implementation.
- (3) The Governing Board should adopt the work plan,

HAS ADOPTED THIS DECISION:

Article 1

The Joint Undertaking's work plan for the year 2019, as annexed to this decision, is hereby adopted. It shall be published on the website of the EuroHPC Joint Undertaking.

¹ OJ L 252, 08.10.2018, p. 1-34

Article 2

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

Done at Luxembourg, on 21 December 2018.

For the Governing Board

Patrick Garda

The Chair

Annex:



European High Performance Computing Joint Undertaking Annual Work Plan 2019

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In accordance with the Statutes of the EuroHPC JU annexed to the Council Regulation (EU) 2018/1488, and with Article 111 of the Financial Regulation of the EU

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

1. INTRODUCTION

The EuroHPC Joint Undertaking (hereinafter “EuroHPC JU”), established by the Council Regulation (EU) 2018/1488² (hereinafter “Regulation”), 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 data infrastructure and to develop and support a highly competitive and innovative High Performance Computing (HPC) ecosystem.

In particular, the overall objectives of the Join Undertaking can be summarised as follows (Article 3 of the Regulation):

- to provide the research and scientific community, as well as the industry including SMEs, and the public sector from the Union or countries associated to Horizon 2020 with the best available and competitive High Performance Computing and data infrastructure and to support the development of its technologies and its applications across a wide range of fields;
- to provide a framework for the acquisition of an integrated, demand-oriented and user-driven world-class petascale and pre-exascale supercomputing and data infrastructure in the Union;
- to provide Union-level coordination and adequate financial resources to support the development and acquisition of such infrastructure, which will be accessible to users from the public and private sector primarily for research and innovation purposes;
- to support an ambitious research and innovation agenda to develop and maintain in the Union a world-class High Performance Computing ecosystem, exascale and beyond, covering all scientific and industrial value chain segments, including low-power processor and middleware technologies, algorithms and code design, applications and systems, services and engineering, interconnections, know-how and skills, for the next generation supercomputing era;
- to promote the uptake and systematic use of research and innovation results generated in the Union by users from science, industry, including SMEs, and the public sector.
- to interconnect and federate regional, national and European High Performance Computing supercomputers and other computing systems, data centres and associated software and applications in cooperation with PRACE and GÉANT.

Given its inter-disciplinary nature and its ability to process large amounts of data and carry out complex computations, HPC is essential to address a wide range of key scientific, industrial and societal applications, such as for example in: earth science and climate change; secure, clean and efficient energy; health, demographic change and wellbeing; food security, sustainable agriculture, marine research and technologies and the bio-economy; pharmaceuticals and chemistry; aerospace and automotive; cybersecurity and defence; smart, green and integrated urban planning; cosmology and astrophysics, etc.

Actions of the EuroHPC programme do not necessarily have to limit themselves to covering only one of these key applications; on the contrary, multi-capability actions will be encouraged wherever relevant. This cross-capability work is vital in creating initiatives of adequate critical mass and vital in fostering innovation that will contribute to the overall goals of EuroHPC.

² OJ L 252, 8.10.2018, p. 1-34.

2. MAIN AREAS OF ACTION

The activities of the Joint Undertaking will consist of:

- **Supercomputing and Data Infrastructure programme:** Acquisition and operation of at least two world-class precursors to exascale supercomputers (capable of around 10^{17} calculations per second) and at least two mid-range petascale supercomputers, and providing and managing access to these systems to a wide range of public and private users. These supercomputers will be hosted in national Supercomputer 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 Participating States of the Joint Undertaking. The acquisitions are foreseen for 2020, as the selection of the hosting entities must be done first.
- **Research and innovation programme on HPC:** to support the development of European supercomputing technology including the first generation of European low-power microprocessor technology, and the co-design of European exascale machines, and to foster applications, skills development and a wider use of High Performance Computing.

Regarding the precursors to exascale systems, the EuroHPC Joint Undertaking will be the owner of these supercomputers it will acquire. The Union's contribution from Horizon 2020 and CEF funds should cover up to 50% of the acquisition costs plus up to 50% of the operating costs of these supercomputers. The operation of each such supercomputer will be entrusted to a hosting entity.

In the case of petascale supercomputers, the Union's contribution from Horizon 2020 and CEF funds should cover up to 35% of the acquisition costs of the supercomputers, to align with the existing funding for innovation procurement in Horizon 2020. The EuroHPC Joint Undertaking should jointly with Participating States procure the petascale supercomputers. The operation of each petascale supercomputer should be entrusted to a hosting entity.

3. CALL FOR SELECTION OF HOSTING ENTITIES

The EuroHPC Joint Undertaking will initiate and manage the Calls for Expression of Interest for hosting petascale and precursors to exascale supercomputers and evaluate the offers received, with the support of independent external experts. The hosting entity will be selected by the Governing Board of the Joint Undertaking following the call for expression of interest.

Pursuant to Article 8 of the EuroHPC Regulation, the EuroHPC Joint Undertaking shall entrust to a hosting entity the operation of each of these supercomputers.

The following Call for Expression of Interest for selection of Hosting Entities is currently foreseen:

Subject	Indicative timetable, 2019
Call for Expression of Interest selection of Hosting Entities	Q1

4. ACQUISITION OF PETASCALE AND PRECURSORS TO EXASCALE SUPERCOMPUTERS

In 2019, the EuroHPC Joint Undertaking will carry out a number of activities for acquiring the above-mentioned precursors to exascale and petascale supercomputers, which will be co-designed with the hosting entities and the amounts will have to be fixed accordingly.

The following list of activities is currently foreseen:

Subject	Indicative timetable, 2019
Calls for Tender of Petascale Supercomputers	Q3
Calls for Acquiring Precursors to Exascale Supercomputers	Q3

The Infrastructure Advisory Group (INFRAG) will make recommendations for supercomputing system architectures that should promote a co-design approach where user requirements will drive the selection of technological solutions.

5. CALLS FOR RESEARCH AND INNOVATION PROPOSALS

The Private Members of the EuroHPC Joint Undertaking, the private associations ETP4HPC and BDVA, representing the HPC community, have identified priorities for indirect actions to be launched in the 2019–2020 period: HPC technologies and systems, and Applications. These priorities will be discussed and adopted in the form of a multiannual strategic research and innovation agenda by the Research and Innovation Advisory Group (RIAG) of the EuroHPC Joint Undertaking.

The final decision concerning the multiannual strategic research and innovation agenda corresponds to the Governing Board, which will adopt an annual work plan and will approve the launch of Calls for proposals for indirect actions with the associated budgets.

The identified priorities address the mastering of the R&D process to develop exascale HPC technologies and systems in Europe for real and relevant applications of scientific, social and industrial value, the development of the software stack, the preparation of applications for the upcoming exascale systems, and the widening of HPC use by supporting competence and skills developments. In particular, the following actions are foreseen:

5.1. European Processor Initiative

The European Processor Initiative (EPI) develops and implements the roadmap for European HPC chips and accelerators facilitating the development of exascale machines. A Framework Partnership Agreement between the European Commission and the EPI consortium (already established) supports with a stable financial and contractual framework the long-term development of such technologies. The EPI Phase 1 is funded by the Horizon 2020 work programme 2018-2019.

The further development of this topic will be financed by the EuroHPC Joint Undertaking and proceed along the following lines:

- EPI Phase 2: developing the first European HPC Systems on Chip and accelerators. Specific focus is on exascale HPC.
- EPI Phase towards Exascale: Co-design and integration of EPI in extreme performance platforms towards European exascale supercomputers.

5.2. Extreme Scale Technologies and Applications

The support for a sustainable exascale HPC ecosystem in Europe requires action on the technology supply to develop extreme scale, power-efficient and highly resilient HPC and data technologies. It requires also actions to adapt and scale up applications with tangible benefits for addressing scientific, industrial or societal challenges for upcoming exascale and extreme performance computing capabilities. This includes the development of the required software stack.

The development of this topic will proceed along the following lines:

- Extreme scale computing technologies (hardware, software, methods and algorithms for key applications)
- HPC applications to ensure European leadership

5.3. Widening HPC skills and use

Widening the use of HPC and attracting new talents requires the creation and coordination of national HPC Competence Centres across the Union. They will engage in training and outreach activities for academic, industrial and public sector users. Especially SMEs need better access to HPC tools and services to increase their innovation capability.

The development of this topic will proceed along the following lines:

- Increase the knowledge and human capital and upraise HPC capabilities, including through the creation of national HPC Competence Centres and their networking and coordination across the Union
- Support to SMEs

Call indicative topic	Indicative timetable	Call process
1. Extreme Scale Technologies and Applications	Q3	single stage
2. Widening HPC skills and use	Q1	single stage
3. European Processor Initiative	Q3	single stage

Details about the eligibility, selection and award criteria; the co-financing rates applied for grants; information on the calls' timetables and the criteria for evaluating the submitted proposals will be described in the calls for proposals of the EuroHPC Joint Undertaking for 2019.

It is foreseen that the calls for proposals will be single stage. Forms of funding envisaged in the calls are exclusively grants.

6. BUDGET

The EU contribution is based on the budget foreseen for the EuroHPC Joint Undertaking in the general Union budget. In 2019, the total EU contribution for the calls for proposals and the calls for acquiring petascale and precursors to exascale supercomputers is **EUR 196.1 million**. This amount represents 100% revenues from the General Union Budget 2019. The amount is subject to its adoption by the budgetary authority and may be updated accordingly.

	2019 EU Budget (EUR million)	2020 EU Budget (EUR million)
Estimated total budget	196.1	280

7. SUPPORT EXPENDITURE

The support expenditure budget will amount to **EUR 2.296.121** in 2019. It will be used to cover staff expenditure and the infrastructure and Joint Undertaking operating expenditure. It represents 100% revenues from the General Union Budget and is subject to its adoption by the budgetary authority; it may be updated accordingly.

- The staff expenditure will cover the costs related to the recruitment of new staff, the remunerations, mission expenses, socio-medical infrastructure and training.
- The infrastructure and operating expenditure will cover the costs related to JU building associated expenses, movable property, telecommunication and other administrative expenditure. It will also serve to cover the running costs in connection with the operational activities (SLAs, evaluations, reviews, etc.), communication and audits.