

European High Performance Computing Joint Undertaking

2020/0260(NLE) - 18/09/2020 - Legislative proposal

PURPOSE: to establish a new European High Performance Computing Joint Undertaking.

PROPOSED ACT: Council Regulation.

ROLE OF THE EUROPEAN PARLIAMENT: the Council adopts the act after consulting the European Parliament but without being obliged to follow its opinion.

BACKGROUND: the European High Performance Computing (EuroHPC) Joint Undertaking was established in October 2018 as a legal and financial framework, pooling resources from the EU, 32 countries, and two Private Members: the European Technology Platform for HPC (ETP4HPC) and the Big Data Value (BDVA) Associations. So far, the Joint Undertaking has used funds from the 2014-2020 Multiannual Financial Framework (MFF) for its strategic investments. After 20 months of operation, it has substantially increased overall investment in HPC at European level and has started to deliver on its mission to restore Europe's position as a leading HPC power.

By the end of 2020, it will deploy a world-class supercomputing and data infrastructure accessible to public and private users all over Europe. This will increase the EU's ability to produce innovative HPC technology.

Global events such as the COVID-19 pandemic have also shown the importance of investing in High Performance Computing and health-related modelling platforms and tools, as they are playing a key role in the fight against the pandemic, often in combination with other digital technologies such as big data and artificial intelligence. High Performance Computing modelling platforms and tools are critical tools for the current and future pandemics, and they will play a key role in health and personalised medicine.

The Council Regulation establishing the EuroHPC Joint Undertaking in 2018 set a target of reaching the next supercomputing frontier, exascale performance, i.e. computing systems capable of executing more than one trillion (10¹⁸) operations per second, by the years 2022 to 2023. This increase of computing power would also come from the deployment of quantum computers and from moving to post-exascale technologies.

CONTENT: the proposed Regulation is in essence a continuation of the existing initiative established under [Council Regulation \(EU\) 2018/1488](#), introducing modifications to adapt the Regulation to the next multiannual financial framework (MFF) Programmes, but also to reflect the priorities of the Commission, and to make it possible for the Joint Undertaking to use funding from the new MFF programmes for 2021-2027. These programmes are [Horizon Europe](#), the [Digital Europe Programme](#) and the [Connecting Europe Facility](#). This funding is essential for Europe to reach this next supercomputing frontier of exascale computing. It will allow the Union to equip itself with a world-class federated, secure and hyper-connected supercomputing and quantum computing service and data infrastructure, and to develop the necessary technologies, applications and skills for reaching exascale capabilities, which is currently foreseen around 2023-2025 and post-exascale around 2025-2027, while promoting a world-class European HPC and quantum computing innovation ecosystem.

Missions and objectives

The mission of the proposed EuroHPC Joint Undertaking is an evolution of the mission of the EuroHPC Joint Undertaking established in October 2018. The long-term objectives in essence are not modified, i.e. the deployment and operation of a world-class High Performance Computing and data infrastructure, and the development and promotion of an excellent European HPC ecosystem. The emphasis is on reaching the exascale era and broadening to new High Performance Computing approaches based on quantum technologies.

The activities of the proposed Joint Undertaking are grouped around five main pillars:

1. Infrastructure: this pillar shall continue focusing on the acquisition of world class supercomputing infrastructure. However, its activities have been expanded to include not only the acquisition, deployment, and operation of a world-class supercomputing infrastructure but also that of a quantum computing infrastructure.

2. Federation of supercomputing services: this is a new pillar. It shall cover activities to provide Union-wide, cloud-based access to federated, secure supercomputing, quantum computing and data resources and services throughout Europe for public and private users. It shall include support for the interconnection of the High Performance Computing, quantum computing and data resources.

3. Technology: this pillar continues to support an ambitious research and innovation agenda for developing a world-class and innovative supercomputing ecosystem. It shall support the technologies and systems required for the interconnection and operation of classical supercomputing systems with other, often complementary computing technologies, in particular neuromorphic or quantum computing.

4. Application: this pillar was part of the technology pillar of the previous EuroHPC Joint Undertaking. However, it is now singled out to recognise its accrued importance, notably the extension to applications of industrial relevance. This pillar shall support activities to achieve excellence and maintain Europe's present leading position in key computing and data applications and codes for science, industry (including SMEs) and the public sector, including support for Centres of Excellence in HPC applications.

5. Widening usage and skills: this pillar was previously part of the technology pillar of the EuroHPC Joint Undertaking, mainly addressing the creation and networking of national HPC Competence Centres. However, it is now singled out to recognise its accrued importance, in particular with the participation in the Digital Skills priority of the Digital Europe Programme. Its aim is to foster industrial access and use of supercomputing and data infrastructures for innovation adapted to industrial needs; and, to provide Europe with a knowledgeable leading scientific community and a skilled workforce.

Joint Undertaking's seat and operation

The Joint Undertaking shall be set up, with its seat located in Luxembourg, and start operating at the latest by early 2021 until 31 December 2033.

Budgetary implications

The EuroHPC Joint Undertaking shall draw its funds from the budgets proposed by the Commission for High Performance Computing activities in the Regulations establishing Horizon Europe, Digital Europe and the Connecting Europe Facility.

The amount from these three programmes shall be matched by an at least equal amount from the Participating States, as part of their national and regional High Performance Computing programmes and their structural funds.

The amount from these three programmes shall be complemented by at least an equal amount from the participating States (Member States and other associated countries) and by EUR 1 billion investments (in kind but also in cash) from the private members of the EuroHPC Joint Undertaking.

The new Joint Undertaking shall have a significantly higher budget than the previous Joint Undertaking until 2033. This amount is expected to be around EUR 8 billion.