












Procedure file

Basic information		
NLE - Non-legislative enactments Regulation	2020/0260(NLE)	Procedure completed
European High Performance Computing Joint Undertaking		
Subject 3.30.06 Information and communication technologies, digital technologies 8.40.08 Agencies and bodies of the EU		

Key players			
European Parliament	Committee responsible	Rapporteur	Appointed
	 Industry, Research and Energy	 CARVALHO Maria da Graça	17/12/2020
		Shadow rapporteur	
		 HRISTOV Ivo	
		 SOLÍS PÉREZ Susana	
		 NIINISTÖ Ville	
		 ROOS Robert	
		 BORCHIA Paolo	
		 MATIAS Marisa	
	Committee for opinion	Rapporteur for opinion	Appointed
	 Budgets	The committee decided not to give an opinion.	
Council of the European Union European Commission	Commission DG Communications Networks, Content and Technology	Commissioner BRETON Thierry	

Key events			
18/09/2020	Legislative proposal published	COM(2020)0569	Summary
11/11/2020	Committee referral announced in Parliament		

26/05/2021	Vote in committee		
31/05/2021	Committee report tabled for plenary, 1st reading/single reading	A9-0177/2021	Summary
23/06/2021	Debate in Parliament		
24/06/2021	Results of vote in Parliament		
24/06/2021	Decision by Parliament	T9-0310/2021	Summary
02/07/2021	Act adopted by Council after consultation of Parliament		
19/07/2021	Final act published in Official Journal		

Technical information

Procedure reference	2020/0260(NLE)
Procedure type	NLE - Non-legislative enactments
Procedure subtype	Consultation of Parliament
Legislative instrument	Regulation
Legal basis	Treaty on the Functioning of the EU TFEU 187; Treaty on the Functioning of the EU TFEU 188 -a1
Other legal basis	Rules of Procedure EP 159
Stage reached in procedure	Procedure completed
Committee dossier	ITRE/9/04195

Documentation gateway

Legislative proposal	COM(2020)0569	18/09/2020	EC	Summary
Document attached to the procedure	SWD(2020)0179	18/09/2020	EC	
Committee draft report	PE689.611	05/03/2021	EP	
Amendments tabled in committee	PE691.126	26/03/2021	EP	
Committee report tabled for plenary, 1st reading/single reading	A9-0177/2021	31/05/2021	EP	Summary
Text adopted by Parliament, 1st reading/single reading	T9-0310/2021	24/06/2021	EP	Summary
Commission response to text adopted in plenary	SP(2021)514	09/08/2021	EC	

Final act

[Regulation 2021/1173](#)
[OJ L 256 19.07.2021, p. 0003](#)

European High Performance Computing Joint Undertaking

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 Undertakings 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.

European High Performance Computing Joint Undertaking

The Committee on Industry, Research and Energy adopted the report by Maria da Graça CARVALHO (EPP, PT) on the proposal for a Council regulation on establishing the European High Performance Computing Joint Undertaking.

As a reminder, the proposed new regulation aims to establish the European High Performance Computing Joint Undertaking (EuroHPC JU), with a budget of EUR 8 billion for the period 2021-2033. This report builds on this proposal and includes a set of amendments aimed at ensuring that this joint undertaking will fulfil its greater goal of serving EU citizens, businesses (including SMEs), research institutions and administrations, while remaining aligned with the EU's main development and sustainability goals.

Overall objectives

The report develops the overall objectives of the Joint Undertaking to include, inter alia, the following:

- to federate the hyper-connected supercomputing and data infrastructure, through high-quality network infrastructures in all Member States, and interconnect it with the European data spaces, in particular with the European Health Data Space;
- to further develop and support a highly competitive, social, sustainable, energy-efficient and innovative, interconnected, interoperable and secure supercomputing and data ecosystem in Europe contributing to the scientific and technological leadership and the standing strategic autonomy of the Union in the digital transition, while reducing dependence on foreign technology;
- to promote, facilitate and widen the use of supercomputing services in all sectors and to contribute to the development of advanced digital skills, competences and knowledge that European science, society, economy, environment and industry need to achieve autonomy and global leadership, with emphasis on enhancing women and girls participation in STEM through involvement and employment and reducing the gender gap in the digital sector.

The Joint Undertaking should also:

- implement its mission and objectives in a clear, simple and flexible way in order to increase attractiveness towards industry, SMEs and all relevant stakeholders. To ensure access to key decisions, Members recommended the creation of a user forum to advise the steering committee and advisory groups;
- minimise any risk involved in handling, storing and processing of personal data in the supercomputing infrastructures and shall comply with the General Data Protection Regulation and other relevant Union legislation;
- ensure that High Performance Computers are exclusively accessible to entities that comply with the same rules and that its resources are open to scientists from all Participating States;
- contribute to safeguarding the interests of the EU when procuring supercomputers and supporting the development of world-class High Performance Computing technologies, systems and applications;
- enable a co-design approach for the acquisition of world-class supercomputers, while safeguarding the security of the supply chain of procured technologies and systems and ensure the highest standards of cybersecurity applicable to supercomputers.

EUs financial contribution

The report stated that the EU's financial contribution should be used for capability building across the whole Union, including the acquisition, upgrades of only supercomputers owned by the EuroHPC Joint Undertaking and operation of High Performance Computers, quantum computers or quantum simulators, the federation of the High Performance Computing and quantum computing service and data infrastructure and the widening of its use, and the development of advanced skills and training, accessible also to citizens living in geographically isolated and disadvantaged areas and taking in due account the need to improve the gender equality.

Synergies and complementarities with other EU funds

Financial contributions under programmes co-financed by the Recovery and Resilience Facility, ERDF, the ESF+, the EMFAF and the EAFRD should also be considered as a contribution of the participating State to EuroHPC, provided that the relevant provisions of the Common Provisions Regulation for 2021-2027 and the fund-specific regulations are complied with.

Environmentally responsible practices

Members insisted that all initiatives and activities should be in line with the European Green Deal. The Joint Undertaking should place particular emphasis on the principle of energy efficiency, stimulate constant technological advancements to improve power-efficiency in both new and existing system designs, and actively research, develop and test novel energy-efficient approaches including in particular fully renewables-based approaches that improve the GHG emission and environmental footprint of supercomputers.

The report also suggested the implementation of an energy management plan with a strategy to increase the energy efficiency of facilities and access to renewable energy through renewable energy purchase agreements.

Awareness raising

To contribute to reducing the skills gap across the EU, the Joint Undertaking should engage in awareness-raising campaigns and promote education and dissemination activities, involving academic, scientific and knowledge networks, social and economic partners, the media, business and SME organisations and other stakeholders, while preventing all kinds of biases, especially gender and racial biases from being introduced in the algorithms, products or conclusions resulting from its work.

European High Performance Computing Joint Undertaking

The European Parliament approved by 643 votes to 9, with 44 abstentions, following the consultation procedure, a legislative resolution on the proposal for a Council regulation on establishing the European High Performance Computing Joint Undertaking.

As a reminder, the proposed new regulation aims to establish the European High Performance Computing Joint Undertaking (EuroHPC), with a budget of EUR 8 billion for the period 2021-2033.

Parliament approved the proposal subject to the following amendments:

Joint Undertakings missions

Members considered that the Joint Undertaking should have the following tasks:

- develop, deploy and extend and maintain a federated, secure, hyper-connected, world-class supercomputing and quantum computing ecosystem of services and data infrastructures in the EU, thus contributing to the EU's world-leading position in science, digital and industrial areas;
- support the development and operation, preferably within the EU, of innovative and competitive supercomputing systems based on a supply chain of critical raw materials and components, state-of-the-art technologies and knowledge limiting the risk of disruption, and to develop a wide range of optimised applications for these systems based on the principles of trust, openness, security, interoperability and portability
- extend the use of this supercomputing infrastructure to a large number of public and private users in the EU, with particular attention to SMEs and start-ups, including those in the research and development phase;
- supporting the development of advanced digital skills, competencies and knowledge for European society, science and industry.

The Joint Undertaking should also:

- implement its mission and objectives in a clear, simple and flexible way in order to increase attractiveness towards industry, SMEs and all relevant stakeholders. To ensure access to key decisions, Members recommended the creation of a user forum to advise the steering committee and advisory groups;
- minimise any risk involved in handling, storing and processing of personal data in the supercomputing infrastructures and shall comply with the General Data Protection Regulation and other relevant Union legislation;
- ensure that High Performance Computers are exclusively accessible to entities that comply with the same rules and that its resources are open to scientists from all Participating States;
- contribute to safeguarding the interests of the EU when procuring supercomputers and supporting the development of world-class High Performance Computing technologies, systems and applications;
- support Europe's global leadership in high value-added products and services, to provide essential components, technologies and skills to close the technology gap with third countries;
- enable a co-design approach for the acquisition of world-class supercomputers, while safeguarding the security of the supply chain of procured technologies and systems and ensure the highest standards of cybersecurity applicable to supercomputers.

EU financial contribution

The Joint Undertaking should be organised around seven pillars, of which one is administrative and six are technical.

The infrastructure pillar, part of the federation of supercomputing services pillar and the widening usage and skills pillar should be funded by the Digital Europe Programme. The remaining activities of the federation of supercomputing services pillar, including the interconnection with the Union's common European data spaces and secure cloud infrastructures, should be funded by Connecting Europe Facility.

The technology, the application and the international cooperation pillars should be funded by the Horizon Europe Framework Programme.

Members proposed that the Union financial contribution should cover up to 50% (compared to 35% proposed by the Commission) of the acquisition costs plus up to 50% of the operating costs of the mid-range supercomputers.

Synergies and complementarities with other EU funds

Financial contributions under programmes co-financed by the Recovery and Resilience Facility, ERDF, the ESF+, the EMFAF and the EAFRD should also be considered as a contribution of the participating State to EuroHPC, provided that the relevant provisions of the Common Provisions Regulation for 2021-2027 and the fund-specific regulations are complied with.

Access time

User allocation of access time to the supercomputers of the Joint Undertaking should be free of charge for private users, including NGOs and individuals, related to research and innovation activities, as well as for private innovation activities carried out by start-ups, based on fair and transparent criteria and procedures. This allocation of access time should be based on open, transparent, periodic and peer-reviewed calls for expressions of interest to ensure a balanced and appropriate allocation of HPC resources.

Environmentally responsible practices

Members insisted that all initiatives and activities should be in line with the European Green Deal. The Joint Undertaking should take into account the energy efficiency principle with a view to improving energy efficiency in the design of new and existing systems and testing new energy efficiency approaches based on renewable energies that improve greenhouse gas emissions and the environmental footprint of supercomputers.

Parliament also suggested the establishment of an energy management plan with a strategy to increase the energy efficiency of facilities and access to renewable energy through renewable energy purchase agreements.