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COMMISSION STAFF WORKING DOCUMENT

EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT

Accompanying the document

Proposal for a Council Regulation

on establishing the European High Performance Computing Joint Undertaking

{COM(2018) 8 final} - {SWD(2018) 6 final}

A. Need for action
What is the problem and why is it a problem at EU level?
<p>Despite efforts and investments made so far, the EU does not have the most performant supercomputers and those existing depend on non-European technology. The available supply of computation time cannot satisfy an ever growing demand. To fill the gap, European scientists and industry need to process their data outside the EU. This can create problems related to privacy, data protection, commercial trade secrets, and ownership of data in particular for sensitive applications.</p> <p>Although the costs have become prohibitive for most market actors, including national governments in Europe, Member States do not coordinate their High Performance Computing (HPC) investment strategies, nor pool the resources. Compared to its competitors from USA, China or Japan, Europe is clearly underinvesting in HPC with a funding gap of EUR 500-750 million per year.</p> <p>The European HPC technology supply chain is weak and the integration of European technologies into operational HPC machines remains insignificant. Without clear prospects of a lead market, without clear prospects of selling an exascale machine to the public sector, the European suppliers will not take the risk to develop the machines on their own.</p> <p>Without the necessary action to ensure the development of the whole HPC ecosystem (from technology components to systems and machines, and to applications and skills) and coordination and pooling of investments in leading-edge HPC infrastructures based on EU technologies, long term negative effects are to be expected, both on the digital economy but also for Europe's sovereignty and scientific and industrial leadership.</p>
What should be achieved?
<p>The objectives are to procure and deploy in Europe in competitive timeframes a world-class pre-exascale HPC infrastructure; make it available to public and private users for developing leading scientific and industrial applications that would foster the development of a broad pre-exascale ecosystem in Europe; and support the timely development of the next generation European HPC technologies and their integration into exascale systems in order to be ready to procure them in competitive timeframes with respect to our world competitors. This will support the EU to rank among the world's top supercomputing powers by realising exascale supercomputers around 2022, based on a competitive EU technology. To reach the target the work has to start now, since a development cycle typically takes four to five years.</p>
What is the value added of action at the EU level (subsidiarity)?
<p>The fragmentation of public HPC efforts across the EU and within Member States leads to inefficient use of resources and only partial cross-border exchange of expertise. No single Member State has the financial means to acquire exascale computing capabilities and develop, acquire and operate the necessary exascale HPC ecosystem on its own and in competitive time frames with respect to the USA, China or Japan. A shared infrastructure and common use of existing capabilities would benefit everyone, from industry, SMEs, science, public sector and especially Member States without self-sufficient national HPC infrastructures. It would secure in particular EU's own independent access to top HPC technology.</p>
B. Solutions
What are the various options to achieve the objectives? Is there a preferred option or not? If not, why?
<p>The different options are: Business-As-Usual, European Research Infrastructure Consortium, Joint Undertaking (JU), European Economic Interest Grouping, Galileo-type program and intergovernmental organisation. The JU is the preferred option as it is the only instrument that allows to effectively and efficiently combining joint procurement and ownership of supercomputers, as well as joint investment in the development of technology for</p>

the procured machines.
What are different stakeholders' views? Who supports which option?
85% of respondents to the targeted consultation (61% of which come from academia/research organisations, 22% business, 4% public sector, and 2% industry associations) agreed that there is a problem with the current state of HPC in Europe and confirmed the need for further action at EU level. Thirteen countries (twelve EU Member States and one Associated Country) already signed the EUROHPC Declaration in which they commit to work together and with the European Commission for acquiring and deploying an integrated world-class HPC infrastructure.
C. Impacts of the preferred option
What are the benefits of the preferred option (if any, otherwise of main ones)?
A JU would have clear positive economic, societal and environmental impacts when compared to all the other explored options. It would lead to the deployment of a world-class HPC infrastructure in Europe, with competitive computational performance and an increased availability to European public and private users (scientists, industry, including SMEs, and the public sector). It would permit to accelerate the advances of European science as well as the competitiveness of the European technology supply industry and the user industry in many sectors and application areas of high economic, societal and environmental relevance.
What are the costs of the preferred option (if any, otherwise of main ones)?
The EuroHPC JU shall be jointly funded by its participating members. The Union financial contribution to the JU to cover administrative and operational costs shall be up to EUR 476 million in the current financial framework.
What are the impacts on SMEs and competitiveness?
SMEs would greatly benefit as they would get better access to the most performing supercomputers in the world, which are nowadays an essential tool to provide competitive products on the global market. Building the HPC ecosystem will also provide more opportunities for SMEs to participate in the development and commercialisation of HPC solutions.
Will there be significant impacts on national budgets and administrations?
The EuroHPC participating states are expected to make a financial contribution to the operational costs of the EuroHPC JU in the order of EUR €476 million in the current financial framework.
Will there be other significant impacts?
A reduction of the administrative burden can be expected as there would be one single legal entity coordinating national and European programmes and investments in HPC.
Proportionality?
The preferred option includes balanced measures, all deemed necessary to achieve the objectives at stake without imposing excessive burden on the relevant stakeholders.
D. Follow up
When will the policy be reviewed?
The JU should be operational by 2019, in particular to launch the procurement of the pre-exascale computers within the current financial framework. After the subsequent acceptance tests of the procured machines the policy would be reviewed to determine if the JU is effective and efficient to coordinate European and Member States programmes with a view of establishing an exascale ecosystem by 2022/2023.