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## RESEARCH EXCELLENCE, INNOVATION AND EDUCATION LAY THE FOUNDATION FOR EUROPEAN OPEN STRATEGIC AUTONOMY AND RESILIENCE

EU's ambition to strive for open strategic autonomy has proven even more important in the light of recent crises such as the Covid-19 pandemic and Russia's military offensive in Ukraine. In the current Horizon Europe Strategic Plan (2021-24), open strategic autonomy is mainly associated with EU's industrial leadership and technological sovereignty. Although these are important elements, the next Horizon Europe Strategic Plan must recognize that the foundation for EU's open strategic autonomy is research excellence, collaboration, world-class innovation ecosystems, as well as competitive education and training systems. CSC believes that an even more powerful competence and knowledge base is the key for sustainable Europe's long-term autonomy, resilience and ability to successfully tackle unforeseen crises in the future.

CSC recommends that next Strategic Plan for Horizon Europe, in line with the new European Research Area (ERA) Policy Agenda, boosts the interaction between ERA and the European Education Area (EEA) to allow for coordinated education and research strategies, policies and investments. Europe needs to achieve a higher level of ambition in which education, training, research and innovation are steered in the same direction, to empower Europe's citizens and underpin knowledge as a basis for democratic, resilient and inclusive societies.

CSC is convinced that a reinforced European open strategic autonomy requires enhanced global partnerships with like-minded actors. Europe's future competitiveness, wellbeing and strategic autonomy will require research cooperation that involves partners from all sectors (private, public, research; different research disciplines and diverse fields of industry) and from all European countries as well as like-minded countries outside Europe looking for solutions to shared challenges. A global approach will maximise the pool of competences and capabilities that European RDI can draw on, and leverage opportunities for scalability and interoperability.

## A STRONG RESEARCH INFRASTRUCTURE FOUNDATION SUPPORTS EXCELLENT R&I AND ACCELERATES THE TWIN GREEN AND DIGITAL TRANSITION

The current Horizon Europe Strategic Plan highlights the significant role of Research Infrastructures (RIs) across the different pillars of Horizon Europe and how they contribute to the objectives of Horizon Europe clusters, missions and partnerships. The unique role of RIs is also recognized in the renewed ERA, and in the Pact for Research and Innovation, where improved access and strengthening of RIs are seen as prerequisites to create a truly functional internal market for knowledge.

CSC considers it important for the next Horizon Europe Strategic Plan to recognize how a world-class RI landscape empowers Europe and contributes to long-term resilience. The development of emerging technologies, such as AI and quantum, will be key for Europe's future technological competitiveness and leadership. A priority for Horizon Europe must be to reduce the



fragmentation of the RI landscape by developing a comprehensive and sustainable ecosystem of interoperable, federated digital infrastructures, where high-performance computing, cloud, quantum, artificial intelligence, data management and network connectivity work in convergence, not in silos, to create opportunities for growth and jobs through research, competence development and innovation. The European RIs must be seen as a strategic asset, that requires sustainable funding models and scalability according to needs of research and society.

The European States and European Commission have already reached great achievements by working together in the digital infrastructure domain to develop the European Open Science Cloud (EOSC) and the European High-Performance Computing Joint Undertaking (EuroHPC JU). EOSC and EuroHPC are drivers of the digital transition since they accelerate the production of new knowledge, and HPC is a key technology for making full use of the data made available via EOSC. Going forward, CSC sees the need for more convergence to ensure that these digital, cross-disciplinary infrastructures work jointly towards advancing sustainable growth and that ambitious, large-scale research missions are supported by the large-scale research infrastructures that they are in need of. Development of EOSC and EuroHPC must also be more clearly linked with the common European data spaces, as well as other parallel initiatives such as GAIA-X, to ensure multi-layer interoperability and scalability among the different data infrastructures, and pave the way for further cross-sector data sharing and re-use to fuel innovation and enhance partnerships. There is a need for publicly funded, federated and interoperable European data infrastructures, that allow for secure data management and re-use in Europe, thereby fostering cybersecurity, reducing dependence on global commercial cloud services and increasing trust among the data owners and users.

#### FOCUS ON THE DUAL CLIMATE IMPACT

The European Green Deal states that all EU actions and policies have to play a role in achieving climate neutrality. The next Strategic Plan must continue to ensure that Horizon Europe's key strategic research and innovation priorities will further accelerate the twin green and digital transition, ultimately leading to a climate-neutral Europe by 2050.

In the next Strategic Plan, CSC would like to see more focus on the role of the circular economy in climate change mitigation, by highlighting the climate impact of research itself. Next-generation tools which are instrumental to advance climate research and green innovation, such as e-infrastructures with high energy consumption, must ensure that their own carbon footprint is as small as possible. When evaluating the footprint, all factors and indicators must be taken into account: the whole lifecycle of any large RI construction, purpose of use, total cost of ownership, energy efficiency, possibility to waste heat utilization and supply of renewable energy sources. These factors make a huge and direct impact on the environmental burden, energy security and cost for whole Europe. To assess the full climate impact and formulate clear climate criteria must become an integral part of carrying out research and innovation in the Horizon Europe programme, in the same way as Open Science was recognised as the modus operandi in the current Horizon Europe strategic plan.