

CLUSTER (Consortium Linking Universities of Science and Technology for Education and Research), is a consortium of 12 elite European Universities in Science and Engineering (and architecture) with associate members from around the world. CLUSTER Universities represent the highest quality engineering and technology education in Europe and are active partners in the European knowledge triangle comprising Education, Research and Innovation. Cluster has an active Ph.D. level consortium with 18 top Chinese Universities, the Sino European Engineering Education Platform. In a world facing unprecedented challenges, engineering, science and technology play a central role. The wellbeing of our society depends on answers to such challenges that can not be addressed by a single nation or discipline. Instead, solving these challenges calls for truly international, multi-disciplinary collaboration and a new mindset. In this setting, CLUSTER universities have a pivotal role in educating the game-changers and nurturing the innovation ecosystems of tomorrow.

Cluster members: Aalto University, Finland; Swiss Federal Institute of Technology in Lausanne, Switzerland; Grenoble Institute of Technology, France; Instituto Superior Técnico, Portugal; Karlsruhe Institute of Technology; Germany, Royal Institute of Technology; Sweden, Katholieke Universiteit Leuven, Belgium; Polytechnic University of Turin, Italy; Trinity College Dublin, Ireland; Darmstadt University of Technology, Germany; Eindhoven University of Technology, the Netherlands, Université catholique de Louvain, Belgium (shared membership with KU Leuven); BarcelonaTECH, Spain.

Cluster Statement on MTR Horizon 2020

The Horizon 2020 funding instruments have made a tremendous impact on the boosting of research and innovation within Europe. Horizon 2020 provides an excellent platform for development of the future framework programs. Accordingly, the CLUSTER consortium strongly supports EC's proposal to increase funding for Horizon 2020 until 2020 in order to promote sustainable peace, democracy, prosperity and wellbeing of the citizens of Europe. CLUSTER universities encourage EU framework programmes, such as Horizon 2020, to be aimed at ground-breaking science, excellent research and innovation. This is imperative, so that urgent action may be taken to combat climate change and to promote sustainable development. CLUSTER emphasizes the importance of agility, speed, digitalization and flexibility in future programmes. We call for proactive design of smooth application processes, harmonized ways of working, and synergies between funding instruments. Strong impacts must be supported through outputs, which requires long-term funding for excellent research and boosting of radical innovations. Creating an understanding of the nature of disruptive change is the driver for providing sustainable benefits for society and the global community.

- 1. A Larger budget is required.** In order to maintain Europe's position globally and to drive the creation of added – value from the Horizon 2020 instrument, it is necessary to increase the support to ground-breaking science and excellent research. The value chain from fundamental research to existing and new markets must become ingrained into the fabric of novel innovation ecosystems, with co- creation and collaboration with stakeholders within Europe and beyond. Therefore, **a larger budget is required for the long-term creation of ground-breaking science, excellent research and innovation.** For successor programmes, larger budget allocations should be directed both at (i) bottom-up collaborative projects under the Excellence pillars: FET-Open, MSCA-ITN, ERC-SynG and possibly new multidisciplinary bottom-up schemes, and (ii) at collaborative projects under the Industrial Leadership Pillar. In addition, the gap between ERC-CoG and ERC AdvG needs to be filled.
- 2. Stronger impact needs to be created.** Emerging disruptive technologies and radical innovations call for flexible and proactive collaboration with the best European as well as international academic and intra-sectoral partners. Consequently, facilitating the emergence of new science and technology business in a faster and more efficient way is imperative e.g. via multidisciplinary

bottom-up and collaborative projects. A concerted effort should therefore be on promoting agility, speed and impact. The focus should be on high quality outputs, impacts and solutions, based on an understanding of the nature of disruptive and radical innovations. EU's research needs to be focused on finding solutions, focusing on outputs and not only on inputs. Innovations are needed to tackle major societal and technological challenges e.g. by promoting Open Science, (Open Access publication and Open Data), increasing the attractiveness of Europe for world's top researchers e.g. through ERC funding, and promoting international and inter-sectoral mobility of young researchers e.g. through MSCA funding.

3. **Increase the harmonization of rules and practices and decrease oversubscription.** Harmonization is urgently needed between EU funding programmes in order to facilitate the use of complementary funding. In addition, harmonization of practices between agencies and project officers should be implemented in order to ensure equal treatment of proposers and grantees. Calls for applications must provide clear and easy – access, detailed information concerning financial and administrative rules, and on possible restrictions, enabling applicants and their respective institutions to adjust their practices accordingly. This is essential for enabling project officers at different locations to effectively deal with Horizon 2020 program management. Two-stage applications procedures should be promoted to minimize unnecessary work. High - ranking projects with the seal of excellence should be flexibly transferred to possible other funding sources, without additional administrative burdens or re-submissions. Streamlining application processes is critical for decreasing the current oversubscription challenge. Budgets need to be more balanced between different topics of funding, which leads to better anticipation of realistic success rates and to more balanced and proactive subscription. Digitalization needs to be integrated more effectively into all preparative and managerial measures and technical issues of the participant portal need to be addressed swiftly, in order to improve practical usability.
4. **Exploitation of research results must be reinforced.** A dedicated instrument needs to be created, e.g. ERC-PoC type of scheme for all three pillars. Exploitation of fundamental research (low TRLs) should be increased, e.g. extra Proof-of-Concept grants for highly successful Pillar II and III projects of low TRLs. Currently, there is an over-emphasis on projects with high TRLs as if such projects would be the best or only way to bring innovations to the market. This is in many ways counter-productive, as it tends to promote incremental innovation by encouraging researchers to focus mostly on mature ideas that can be brought to market within a short time span. The notion that some programs select proposals based only on a rigid evaluation of their TRL status and discard others, irrespective of their potential, has caused a rift between pillars and priorities, which is not conducive to the correct alignment between them. Accordingly, the current scheme promotes a disconnect between the “Excellent science“ and the solution of the “Societal Challenges“. Rigid categorization of TRLs are difficult to match with the nature of scientific and rapidly evolving disruptive innovations. The current over-emphasis on high – TRLs is also not conducive to increasing or widening collaboration within Europe, as setting the bar at higher TRLs limits participation of multiple universities and research centers in joint developments. Accordingly, the actions could be simply grouped into **Research – Track to innovation – Innovation** stages. Alternatively, the creation of another instrument able to cover the whole innovation chain could also be proposed. The idea would be to support long-term programs (e.g. over 10 years in duration) in a given field starting from TRL 1 or 2 and ending at TRL 7 or 8. Such types of long-term programmes exist currently only for low TRLs (FET Flagship) or high TRLs (EIT/KICs). Therefore, a new type of project /programme, which links disruptive science and technologies and innovations/products close to market could provide an effective way for ensuring that the most promising results from Academia are transferred to Industry.

5. **Synergies between various EU programmes need strengthening.** Investments in Horizon 2020 create more synergies with other EU programmes and national funds. Therefore, a programme continuum must be established in order to attract even more private investments to help boost Europe's performance in answering to global economic, societal and environmental challenges. The EC proposal to increase the funding of Horizon 2020 is of utmost importance in order to **strengthen the role of universities in feeding disruptive innovation and supporting highly interactive innovation eco-systems as well as safeguarding funding for bottom-up science-driven inventors, entrepreneurs and their ideas.** The EU should prepare a new ethical, legal and financial framework allowing for broad participation of institutions from the entire European Research Area (ERA). It is imperative to strive to develop a less-complex, flexible and proactive way of collaboration. Disruptive and radical innovations do not proceed in a linear manner, and will therefore not be fostered by rigid and highly regulated systems. The vision of the European Innovation Council (EIC) offers many interesting opportunities for the future and CLUSTER is committed to contributing to its further development. Currently, however, due to very differing evaluation criteria and financial and administrative rules in H2020 and ESIF as well as other structural fund programmes, the complementary use of these funding sources cannot be actively encouraged in the Universities. This is particularly troublesome if the goals and regulations of EFSI funds vary dramatically from country to country and region to region. Such regulations are often very strict, irrespective of the nature of the projects, and this is not equally suitable for Universities and other stakeholders, such as industry, local governments etc. Therefore, better synergies between ESIF and other EU funding programs should be created after Horizon 2020. Funding from the European Fund for Strategic Investments (EFSI) should also be made possible in the form of grants for universities in order to allow new ecosystems of Academia and business enterprises to evolve.