Digital Economy and Society Index (DESI) 2021

Research and Innovation: ICT projects in Horizon 2020

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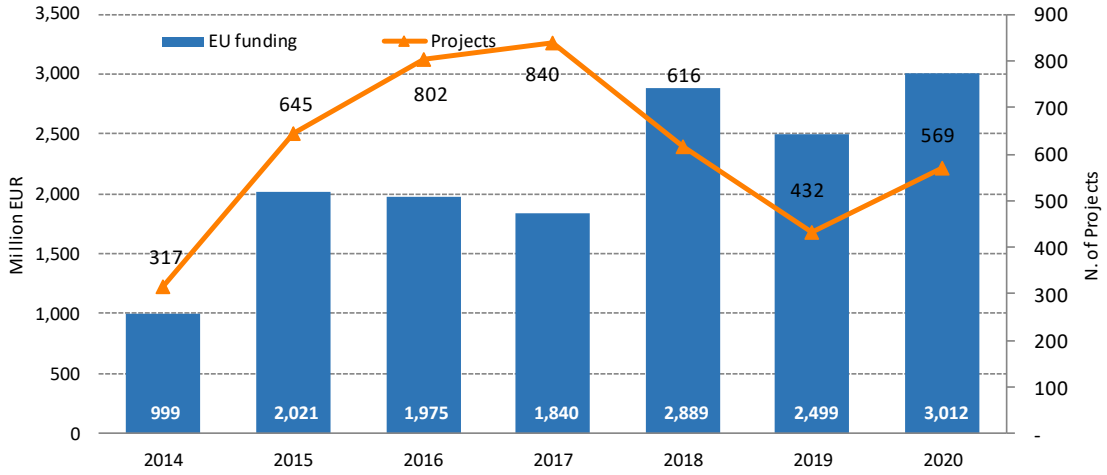
1 Research and Innovation: ICT projects in Horizon 2020

1.1 Projects and EU funding

Between 2014 and 2020, Horizon 2020 allocated more than €15.2 billion of EU funding to about 4,220 projects in ICT-related areas.

In 2020, there were around 570 projects signed, for a total EU funding of approximately €3 billion. After the decreasing trend recorded between 2017 and 2019, the number of ICT-related projects increased again in 2020, although it remained below the peak reached in 2017. In 2020, there was also a notable increase in EU funding.

Figure 1 EU Funding and projects by year, 2014-2020



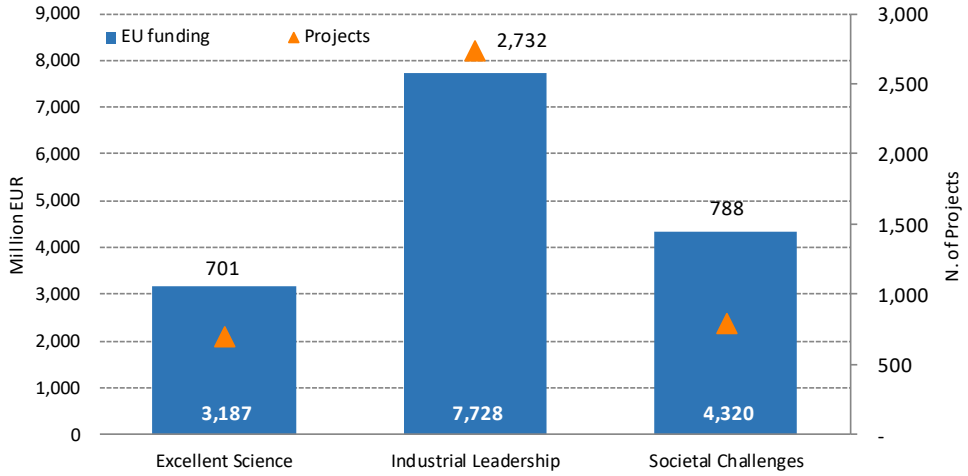
Source: European Commission services

Most of the support has been assigned through the Industrial Leadership pillar, which covers R&I activities on generic ICT technologies driven by either industrial roadmaps or bottom-up processes. This pillar, which includes the component "Leadership in Enabling and Industrial Technologies (LEIT)", accounted for about €7.7 billion, or more than half of all EU funding for ICT related projects. Industrial Leadership also accounts for about 2,700 projects (65 % of the total). Within Industrial Leadership, more than half of the projects (56 %) and of the funding (83 %) could be attributed to LEIT ICT.

The Societal Challenges pillar addresses application-driven R&I from a multi-disciplinary perspective. Projects to some extent involving ICT were financed in all of the seven societal challenges, but in particular: secure, clean and efficient energy; health, demographic change and wellbeing; and secure societies. This pillar accounted for about 28 % of EU funding (€4.3 billion) and 19 % of projects (788 projects).

The Excellent Science pillar supports research to uncover radically new technological possibilities and ICT contributions. It includes "e-infrastructures" and Future&Emerging Technologies (FET). Areas covered include high performance computing (HPC), quantum technologies and neuromorphic computing technologies. It accounted for 21 % of EU funding (€3.2 billion) and 17 % of ICT-related projects (around 700 projects).

Figure 2 EU Funding and projects by pillar, cumulated values 2014-2020



Source: European Commission services

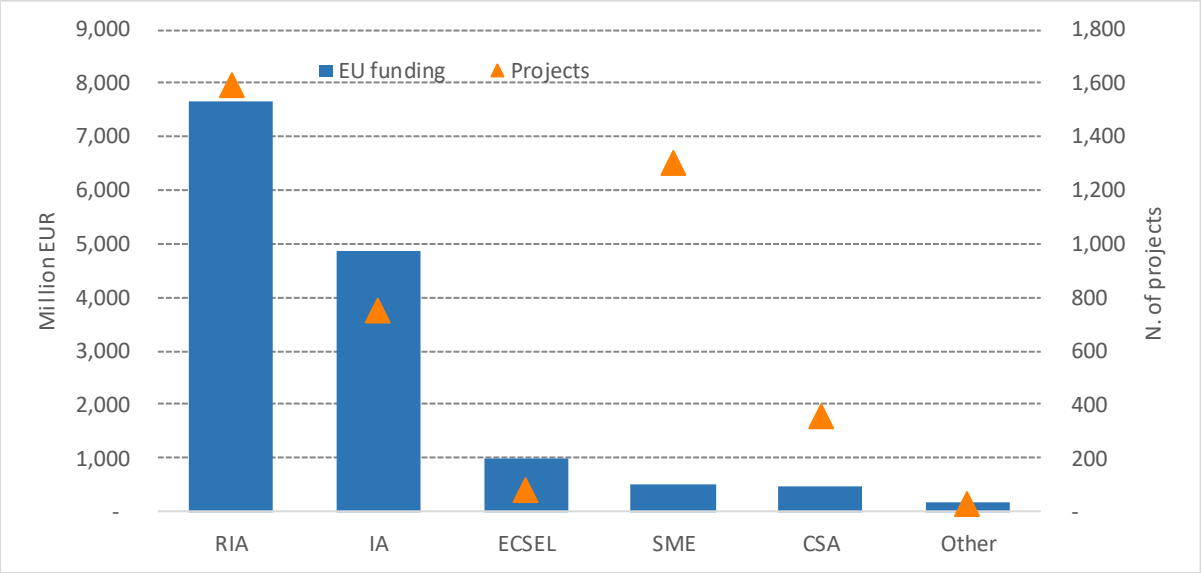
Regarding the distribution of projects and funding by type of actions, research and innovation actions (RIA) accounted for the largest share of EU funding in ICT-related projects under Horizon 2020. Between 2014 and 2020, 51 % of total EU funding was channelled through RIA, corresponding to approximately €7.8 billion. RIA aim to uncover new knowledge and/or explore the feasibility of a new or improved technology, products, processes, services or solutions.

Innovation actions (IA) are the second most important instrument in terms of funding (€4.8 billion or 32 % of total EU funding between 2014 and 2020). They aim to produce plans and arrangements or designs, and may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.

During the same period, other important action types included:

- SME instrument projects, which accounted for about €512 million of EU funding and, given their smaller size, a large share of projects (over 1,300 or 31 % of all ICT-related projects).
- Around 80 projects were channelled through the ECSEL Joint Undertaking (i.e. the Public-Private Partnership for Electronic Components and Systems), accounting for more than €984 million (or 6 %) of the total EU funding for ICT.
- Coordination and support actions (CSA), which focus on accompanying measures such as standardisation, dissemination, awareness-raising and communication, received €453 million (3 % of the funding).
- The remaining action types, such as pre-commercial procurement (PCP), public procurement for innovation (PPI) and European research area (ERA-NET) actions, have a more limited scope of application and accounted for a limited share of both projects and funding.

Figure 3 EU Funding and projects by type of action, cumulated values 2014-2020



Source: European Commission services

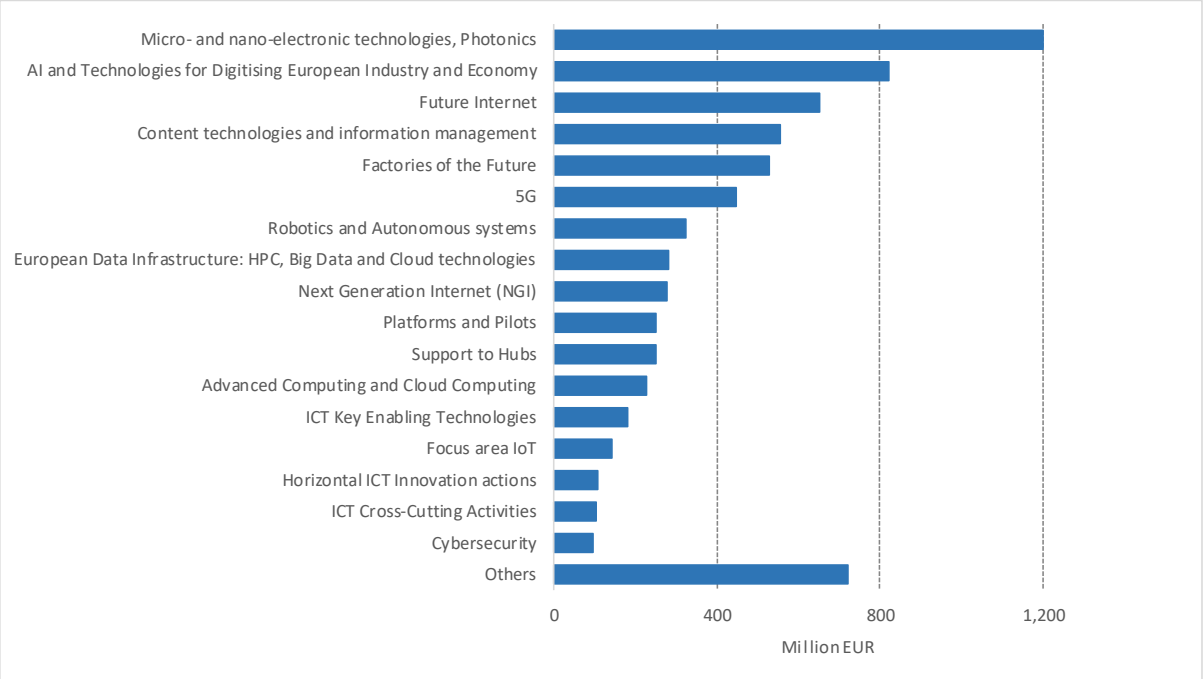
Others include: ERA-NET-Cofund; PCP; SGA-RIA; FPA; COFUND-PCP; PPI; IA-LS; COFUND-PPI.

Looking at the distribution by areas of the work programmes, within the Industrial Leadership pillar, projects under the LEIT components span across a number of areas: from micro- and nano-electronic technologies and photonics, to AI and technologies for digitising European industry, factories of the future, future internet and content technologies and information management (about €3.8 billion, taken all together). This pillar also includes the component "Innovation in SMEs", which offers opportunities for ICT SMEs.

Within Excellent Science, Future and Emerging Technologies (FET) are the major area of work. It includes: FET Open (which received approximately €940 million); FET proactive (around €617 million); and FET flagships (about €526 million). Research infrastructure, which include e-Infrastructures, also received significant funding (about €1 billion).

Under the Societal Challenges, ICT-relevant projects were mainly funded in the area of "secure, clean and efficient energy" (almost €1.8 billion between 2014 and 2020), and in the areas of "health, demographic change and wellbeing" and "secure societies" (respectively €952 million and €637 million).

Figure 4 EU funding, Industrial Leadership pillar- LEIT, by area, cumulated values 2014-2020



Source: European Commission services

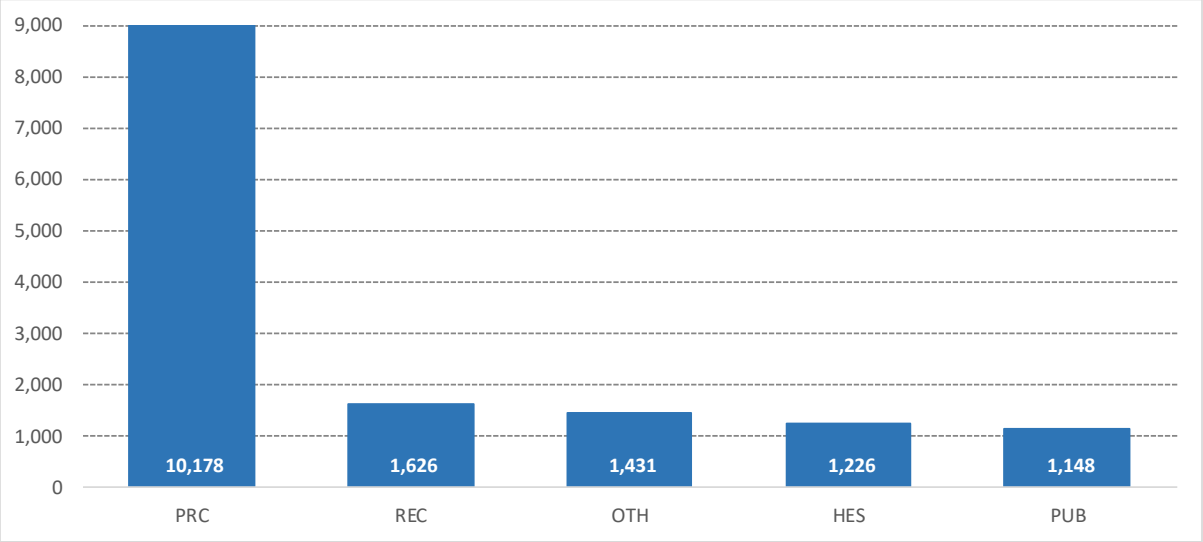
1.2 Participants and geographical distribution

Regarding participants, between 2014 and 2020 there were more than 15,600 participations in Horizon 2020 projects related to ICT topics.

Business involvement was significant, with private for-profit companies (PRC) accounting for 39 % of the funding and 65 % of participations. Secondary and higher education establishments (HES) and research organisations (REC), taken together, accounted for about 18 % of participations and almost half (i.e. 53 %) of total funding.

Public organisations (PUB) other than those involved in research and education accounted for a relatively small share of both funding and participations (about 3.7 % and 7.4 % respectively).

Figure 5 Number of participations, by category, cumulated values 2014-2020

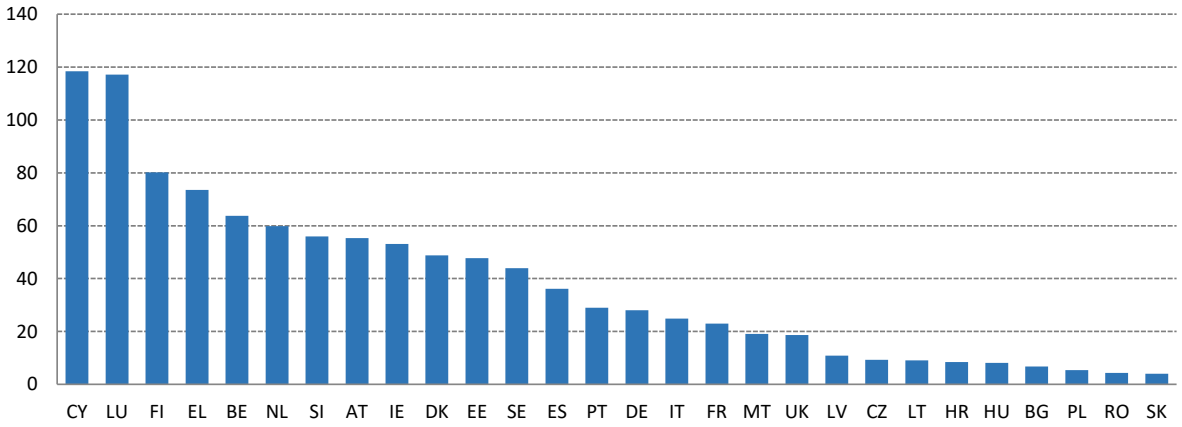


Source: European Commission services

When looking at the geographical distribution, EU-28 Member States accounted for the vast majority of funding and participations in ICT-related Horizon 2020 projects. Between 2014 and 2020, beneficiaries from EU-28 Member States accounted for 92 % of funding and 89 % of participations.

In absolute terms, the EU's largest economies were the main recipients of EU funding for ICT-related projects under Horizon 2020. Germany, Spain, France and Italy accounted for 42 % of participations and 46 % of total EU funding in the period 2014-2020. The United Kingdom was also a large beneficiary, accounting for 7.3 % of the total participations and 8.2 % of the total funding. When considering the country population, Cyprus, Luxembourg, Finland and Greece were among the Member States with the highest amounts of funding per capita.

Figure6 EU funding per capita, cumulated values 2014-2020



Source: European Commission services

The remaining share of funding and participations was mainly absorbed by Associated Counties[1]. Associated countries (primarily Switzerland, Norway and Israel) received 7.3 % of total funding, and 95 % of funding that went to non-EU 28 beneficiaries.

1.3 Methodological notes

Source: The report is based on CORDA data elaborated by DG CONNECT.

Coverage: This report considers projects supported through Horizon 2020 funding in ICT-related topics, as defined in the Commission's "Guide to ICT related activities" covering the period in the scope of the analysis (i.e. 2014-2020). Specifically, the analysis has been based on the following documents, further updated to take into consideration revisions of the Horizon 2020 Work Programmes:

- https://ec.europa.eu/programmes/horizon2020/sites/default/files/ICT%20in%20H2020%20WP2014-15_0.pdf;
- https://ec.europa.eu/programmes/horizon2020/sites/default/files/Guide%20to%20ICT-related%20activities%20in%20WP2016-17.pdf;
- https://digital-strategy.ec.europa.eu/en/library/guide-ict-related-activities-horizon-2020-work-programme-2018-20.

The Fast Track to innovation pilot and the European Innovation Council pilot are excluded from the analysis.

[1] Associated countries (art. 7 of the H2020 Regulation): Iceland, Norway, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey, Israel, Moldova, Switzerland (partial association: Excellent Science Pillar only), Faroe Islands.

The report considers projects signed until 31 December 2020. Only projects for which the signature year was known at the time of writing are taken into account.