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Europe's Digital Progress Report 2016

6. R&D AND ICT SECTOR

METHODOLOGICAL NOTE

Definition of the ICT sector

In this section, the ICT sector is defined according to the definition provided by the OECD on the basis of the NACE (Statistical Classification of Economic Activities in the European Community) Rev.2 (2008) nomenclature. The ICT sector has 12 sub-sectors:

- ***ICT manufacturing***

C261 Manufacture of electronic components and boards
C262 Manufacture of computers and peripheral equipment
C263 Manufacture of communication equipment
C264 Manufacture of consumer electronics
C268 Manufacture of magnetic and optical media

- ***ICT services***

G4651 Wholesale of computers, computer peripheral equipment and software
G4652 Wholesale of electronic and telecommunications equipment and parts
J5820 Software publishing
J61 Telecommunications
J62 Computer programming, consultancy and related activities
J631 Data processing, hosting and related activities; web portals
S951 Repair of computers and communication equipment

Comprehensive vs operational definition

The **comprehensive definition** of the ICT sector applies to EU Member States for the period 2008-2012. It corresponds to the definition provided by the OECD in 2007.

The **operational definition** of the ICT sector enables an international comparison with non-EU countries over a longer period (2006-2012), as some of these countries do not have the necessary disaggregated information to estimate all the ICT sub-sectors included in the comprehensive definition. The operational definition does not include the following sectors: manufacture of magnetic and optical media (268) and ICT trade industries (465).

Sector analysis

In the following section, a sector analysis is made for each indicator. The 12 sub-sectors are aggregated into four sectors: ICT manufacturing (excluding communication equipment), communication equipment, ICT services (excluding telecommunications) and telecommunications.

Source

Joint Research Centre – Institute for Prospective Technological Studies (JRC-IPTS) calculations and estimates, based on Eurostat, the OECD's structural analysis database (STAN), EU-KLEMS data, and the JRC's PREDICT project.

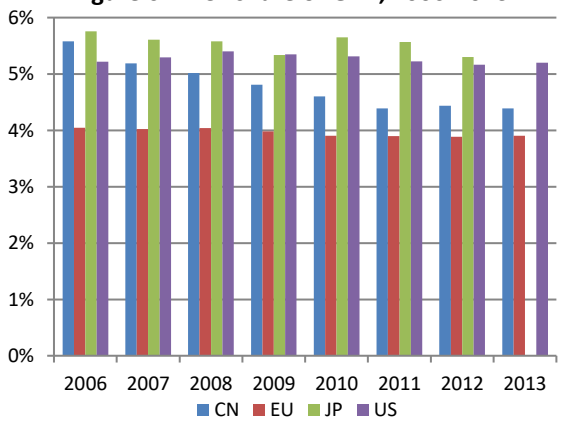
All data contained in these databases come from official sources (e.g. Eurostat, OECD, national statistical institutes). However, there may be some discrepancies with the original sources, e.g. owing to updates of the original data or the use of multiple auxiliary sources and variables.

VALUE ADDED IN THE ICT SECTOR
at EU and global level

Value added in the ICT sector (comprehensive definition*) accounted for 4.3 % of EU GDP in 2013. However, value added in the ICT sector (operational definition*) in the EU (3.9 %) was behind China (4.4 %) and the US (5.2 %) in 2013 (no data for Japan in 2013, but Japan and the US had similar levels in 2012).

** See methodological note.*

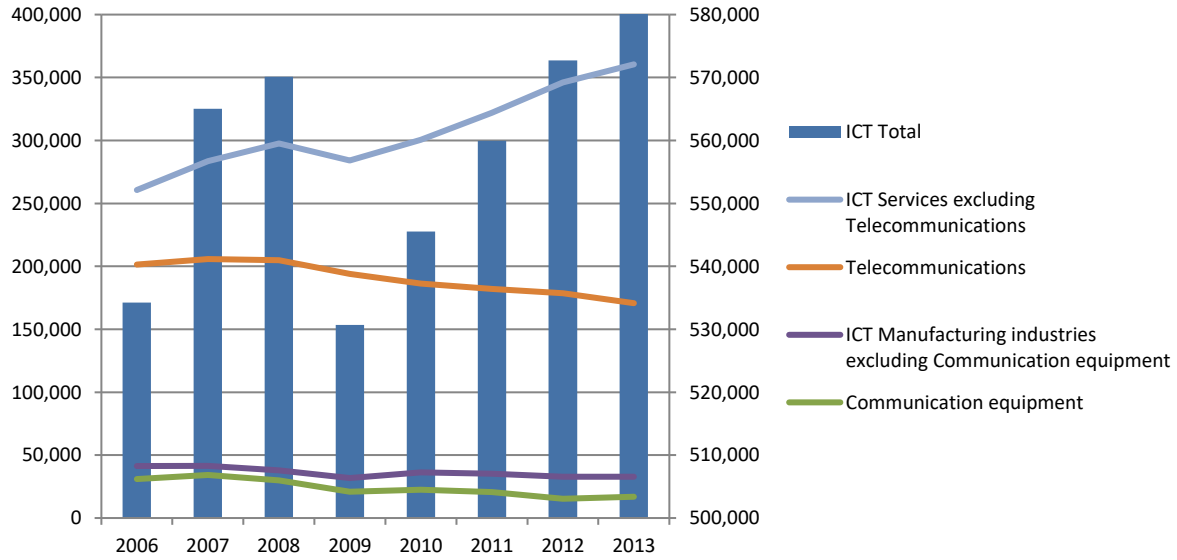
Figure 6.1: ICT share of GDP, 2006-2013



Source: European Commission, PREDICT database

The ICT sector **value added** amounted to €581 bn in 2013. After a slowdown in 2009, the ICT sector experienced a recovery. A breakdown by sub-sector shows the predominance of ICT services (€531 bn and 91 % of total ICT value added in 2013) over ICT manufacturing industries (€50 bn and 9 % of total ICT value added in 2013). The ICT services sector (excluding telecommunications) is the only one that saw an increase in value added over the medium-term period (2006-2013) up to €360 bn. The communication equipment sector experienced the sharpest decline over the medium-term period (2006-2013). After peaking at €34 bn in 2007, it fell to €17 bn in 2013, indicating structural decline.

Figure 6.2: Value added in the ICT sector, 2006-2013 (in € millions)

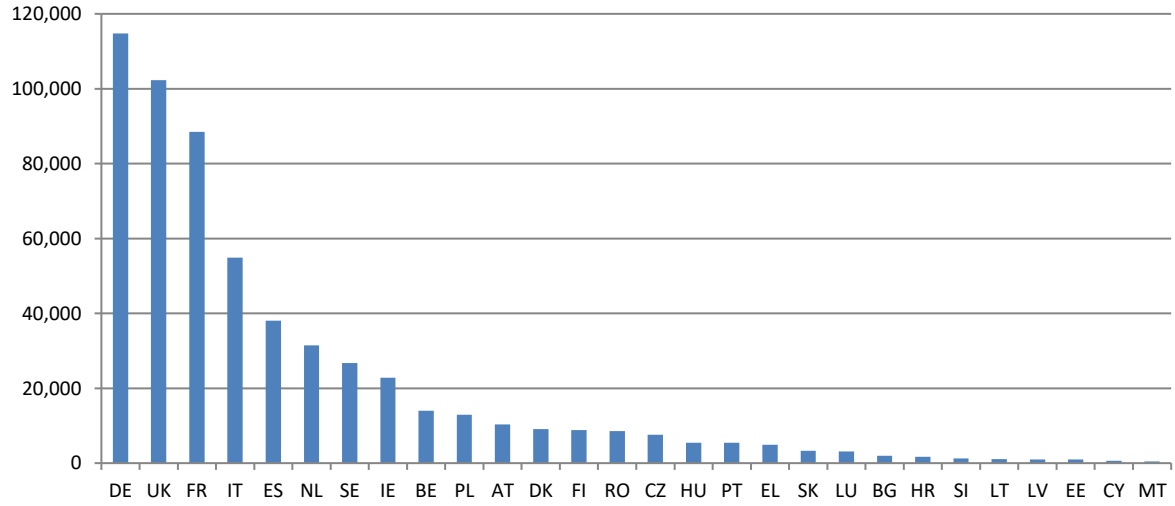


Source: European Commission, PREDICT database

VALUE ADDED IN THE ICT SECTOR
by Member State

Unsurprisingly, the five largest economies were also the **five biggest contributors** to ICT value added in 2013: Germany (€115 bn or 20 %), the United Kingdom (€102 bn or 18 %), France (€88 bn or 15 %), Italy (€55 bn or 9 %) and Spain (€38 bn or 7 %). Together, these five countries represented 69 % of total EU ICT value added in 2013.

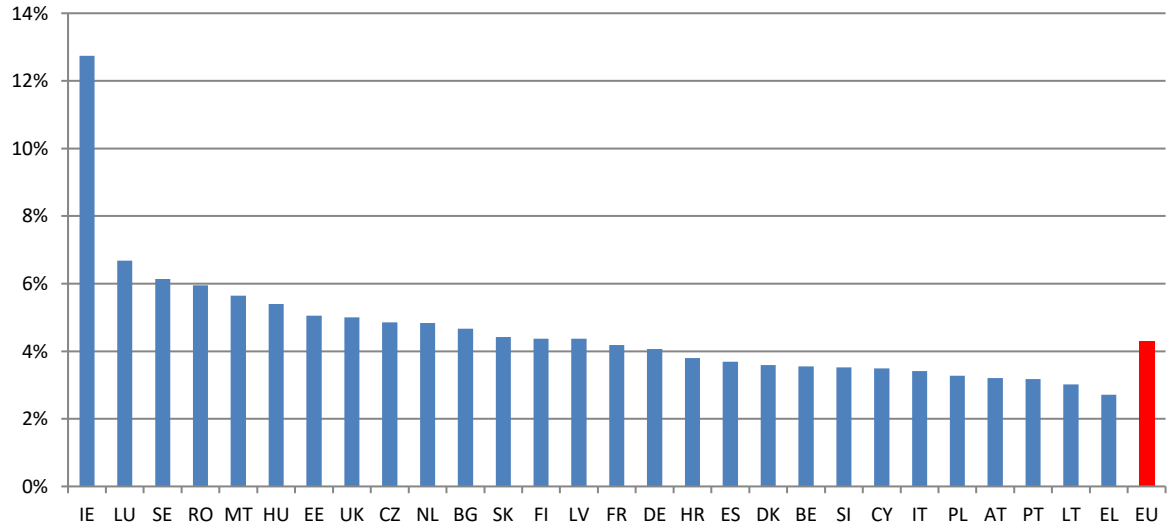
Figure 6.3: Value added in the ICT sector, 2013 (in € millions)



Source: European Commission, PREDICT database

Ireland had — by far — the highest ICT share of GDP, with a rate of 12.7 % in 2013, while Greece was lagging behind with less than 3.0 %. After Ireland, countries with the highest share of ICT included Luxembourg (6.7 %) and Sweden (6.1 %). Some eastern Member States (Romania, Hungary, and Estonia) also had a high rate of ICT as a share of GDP. In most other Member States, ICT remained broadly stable as a proportion of GDP over the medium-term period (2006-2013), except in Finland, where the rate fell by 4.2 pp. in 2006-2013.

Figure 6.4: ICT as share of GDP, 2013



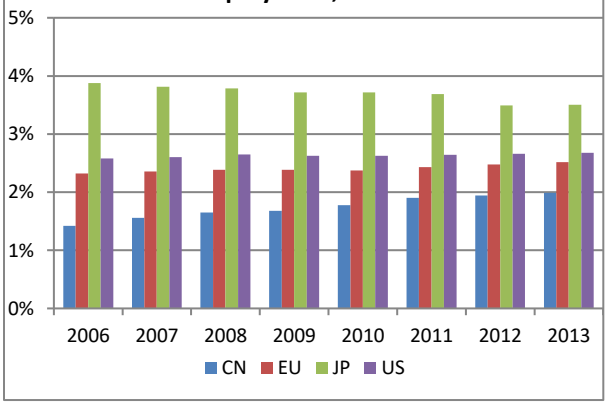
Source: European Commission, PREDICT database

EMPLOYMENT IN THE ICT SECTOR
at EU and global level

Employment in the ICT sector (comprehensive definition*) represented 2.8 % of EU total employment in 2013, remaining stable over the medium-term period. In comparison with the US (2.7 %), the EU (2.5 %) fared better than China (2.0 %), but all three lagged markedly behind Japan (3.5 %) in 2013 (comparable operational definition*)

** See methodological note.*

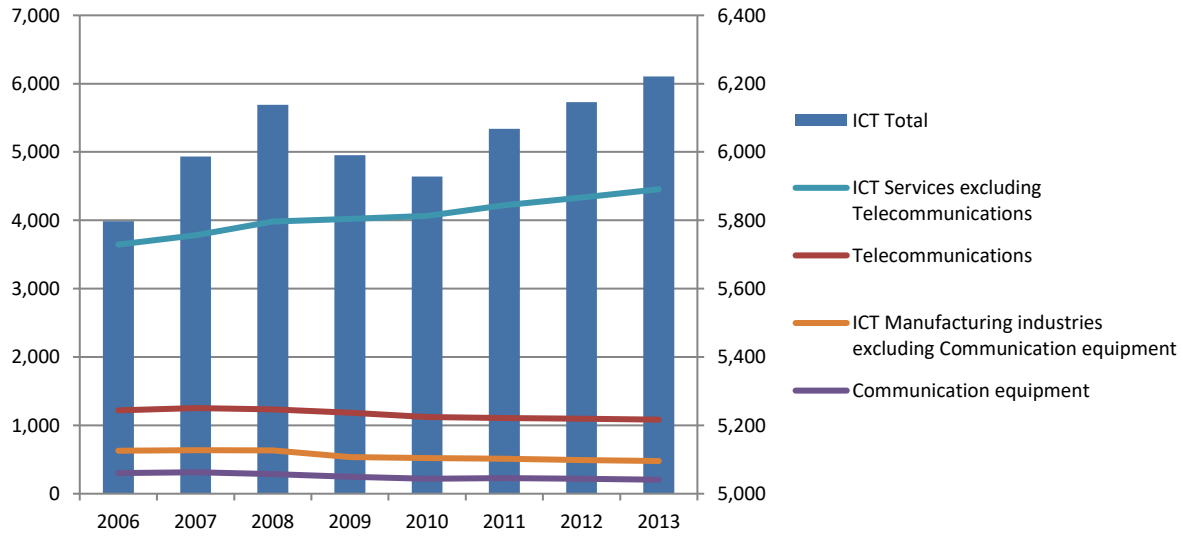
Figure 6.5: ICT employment as a share of total employment, 2006-2013



Source: European Commission, PREDICT database

The ICT sector **employed** a just over 6.2 m people in 2013, close to its peak of 6.2 m in 2008. The ICT services sector (excluding telecommunications) employed 4.5 m people and accounted for 70 % of total ICT employment in 2013. It is the only sector that recorded a structural increase over the medium-term period (2006-2013). The telecommunications sector employed over 1 m people in 2013, a number which fell over the medium-term period. The ICT manufacturing industries sector (excluding communications equipment) employed 478 000 people in 2013 and this number was falling. The communication equipment sector recorded the sharpest structural decline in 2013, falling to 204 000 people.

Figure 6.6: Employment in the ICT sector, 2006-2013 (in thousands of people)

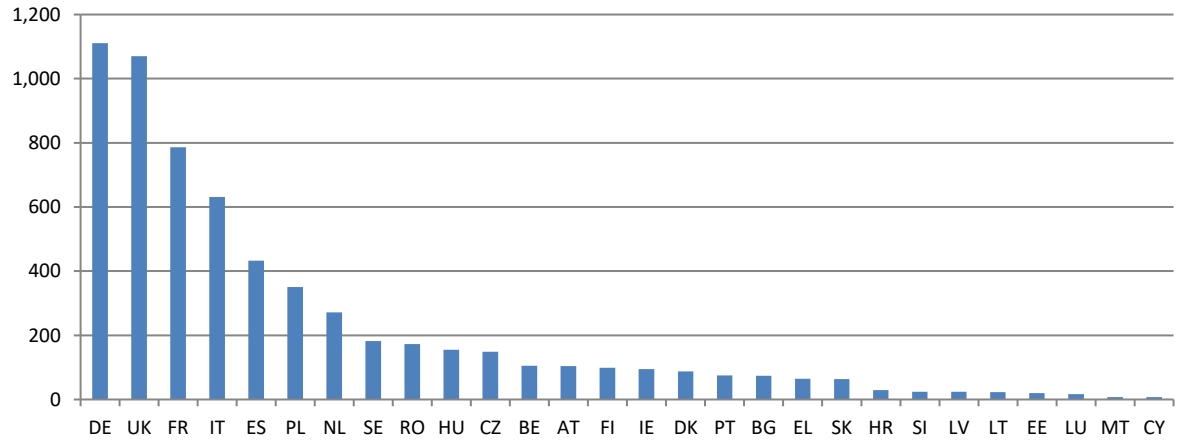


Source: European Commission, PREDICT database

EMPLOYMENT IN THE ICT SECTOR
by Member State

As in the case of value added, the five largest economies were also the **five largest employers** in the ICT sector in 2013: Germany (1.1 m people or 18 %), the United Kingdom (1.1 m people or 17 %), France (0.78 m or 13 %), Italy (0.63 m or 10 %) and Spain (0.43 m or 7 %). Together, the five largest employers represented 65 % of total ICT employment in 2013.

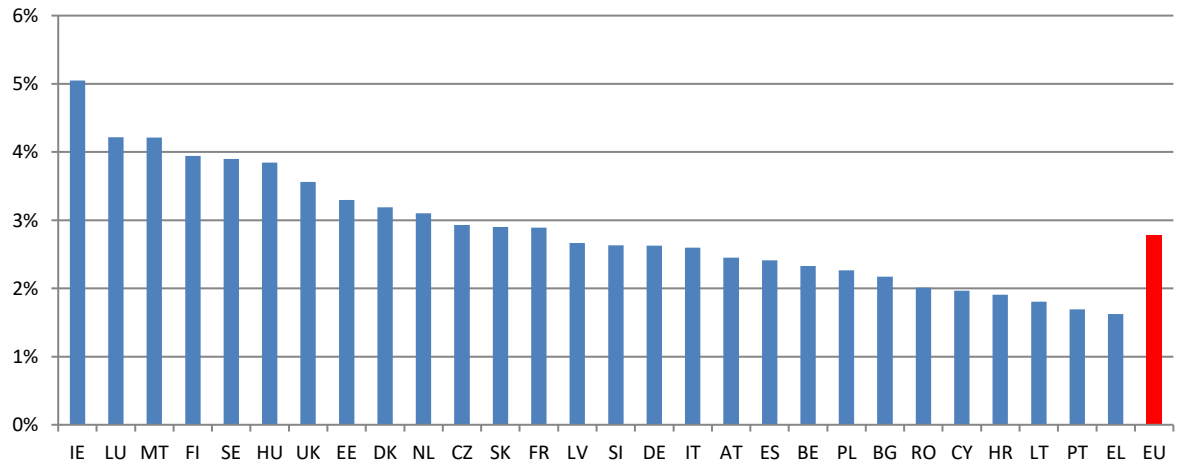
Figure 6.7: Employment in the ICT sector, 2013 (1000 persons)



Source: European Commission, PREDICT database

Ireland was in pole position with 5.1 % ICT employment as a share of total employment in 2013, and Greece had the lowest rate of only 1.6 %. Other countries that were performing well include Luxembourg and Malta (4.2 % in 2013). Finland, Sweden and Hungary followed closely behind with rates of between 3.8 % and 3.9 %. Over the medium-term period (2006-2013), the share of ICT employment as a proportion of total employment remained stable in most countries.

Figure 6.8: ICT employment as a share of total employment, 2013



Source: European Commission, PREDICT database

PRODUCTIVITY IN THE ICT SECTOR
at EU and global level

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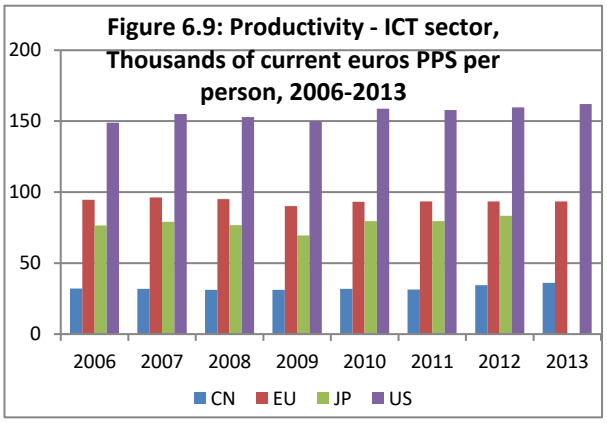
Regarding the **productivity** of the ICT sector (operational definition*), the EU is somewhat behind the US (€162 000 per person), but far higher than China (€36 000 per person), which in this respect still an emerging country (no data are available for Japan in 2013, but Japan and the EU had similar ICT productivity levels in 2012).



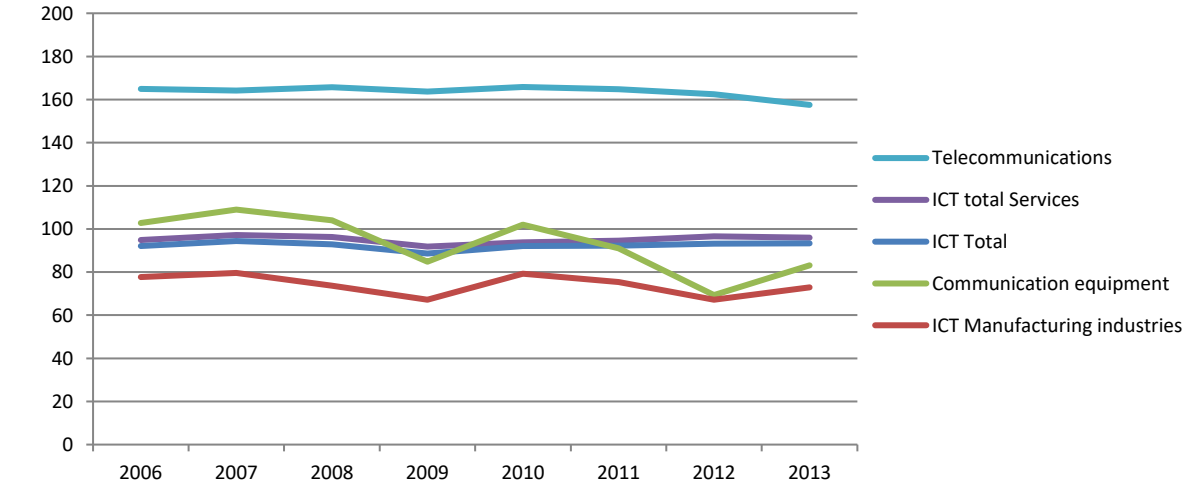
** See methodological note.*

Source: European Commission, PREDICT database

Productivity in the ICT sector (comprehensive definition*) amounted to €93 000 per person in 2013, remaining broadly stable over the medium-term period. In the ICT manufacturing sector, productivity was below average (€73 000 per person in 2013); moreover, it is volatile and pro-cyclical in relation to the business cycle. The communications equipment sector is even more sensitive to the business cycle. Unlike the manufacturing sector, productivity in the ICT services sector as a whole (i.e. services and trade), which stood at €96 000 per person in 2013, is not sensitive to business cycles. Although productivity in the telecommunications sector is very high (at €158 000 per person in 2013), wholesale trade productivity is average (at €92 000 per person in 2013).

** See methodological note.*

Figure 6.10: Productivity — ICT sector (comprehensive definition), thousands of current euros per person, 2006-13

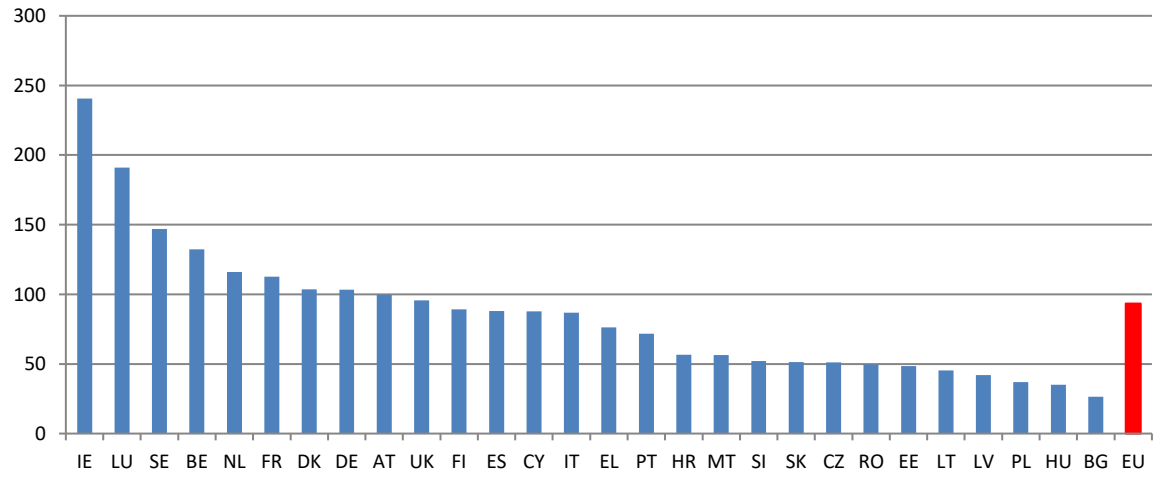


Source: European Commission, PREDICT database

PRODUCTIVITY IN THE ICT SECTOR
by Member State

In terms of **labour productivity** in the ICT sector, Ireland (€240 000 per person), Luxembourg (€191 000 per person) and Sweden (€147 000 per person) led the way in 2013. At the opposite end of the scale were Poland (€37 000 per person), Hungary (€35 000 per person) and Bulgaria (€26 000 per person).

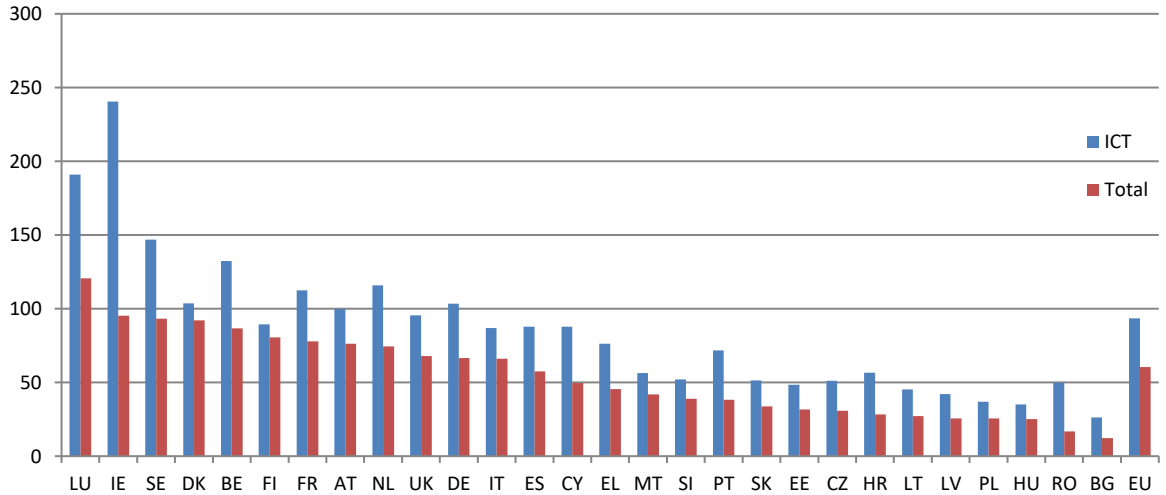
Figure 6.11: Productivity — ICT sector (comprehensive definition), thousands of current euros per person, 2013



Source: European Commission, PREDICT database

The picture for **labour productivity** in the economy as a whole was broadly similar. Luxembourg (€121 000 per person), Ireland (€95 000 per person) and Sweden (€93 000 per person) were still the best-performing countries, while Hungary (€25 000 per person), Romania (€17 000 per person) and Bulgaria (€12 000 per person) were at the bottom of the table.

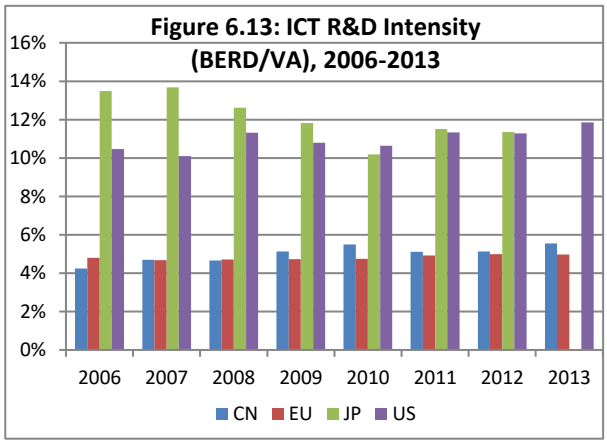
Figure 6.12: Productivity — ICT and total, thousands of current euros per person, 2013



Source: European Commission, PREDICT database

BUSINESS ENTERPRISE R&D (BERD) EXPENDITURE IN THE ICT SECTOR at EU and global level

R&D intensity in the ICT sector (comprehensive definition*) amounted to 5.0 % in 2013. Although the EU compares therefore favourably to China (5.5 %), both the EU and China lagged behind the US (11.8 %) in 2013 (comparable operational definition*, no rate available for Japan in 2013, but Japan and the US were at a comparable level in 2012).

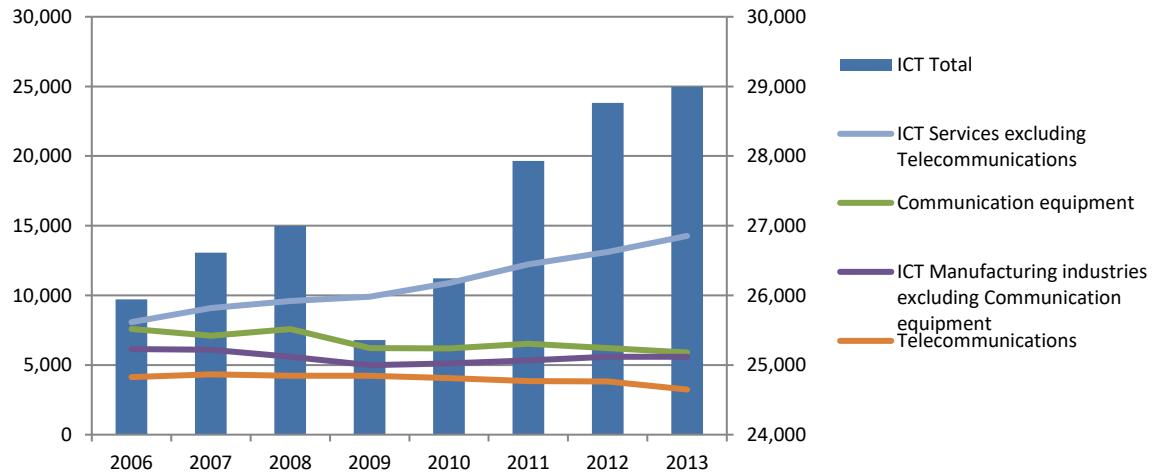


** See methodological note.*

Source: European Commission, PREDICT database

Business enterprise R&D (BERD) expenditure in the ICT sector amounted to €29 bn in 2013, its highest point over the medium-term period (2006-2013), an improvement on its lowest point of €25 bn reached in 2009. A breakdown by sub-sector reveals a more balanced situation for BERD than for value added – despite accounting for only 9 % of ICT value added, the ICT manufacturing sector was responsible for 40 % of total ICT BERD spending (€11 bn) while the ICT services sector was responsible for 60 % (€18 bn) of ICT BERD spending in 2013. Over the medium-term period (2006-2013), the situation was quite different. The ICT manufacturing sector saw a structural decline (falling by 16 % from 2006 to 2013), whereas the ICT services sector saw a structural increase (rising by 43 % over 2006-2013), particularly in the ICT services sector (excluding telecommunications), which saw an increase of 77 % from 2006 to 2013.

Figure 6.14: ICT business expenditure on R&D (BERD), 2006-2013 (€ millions)

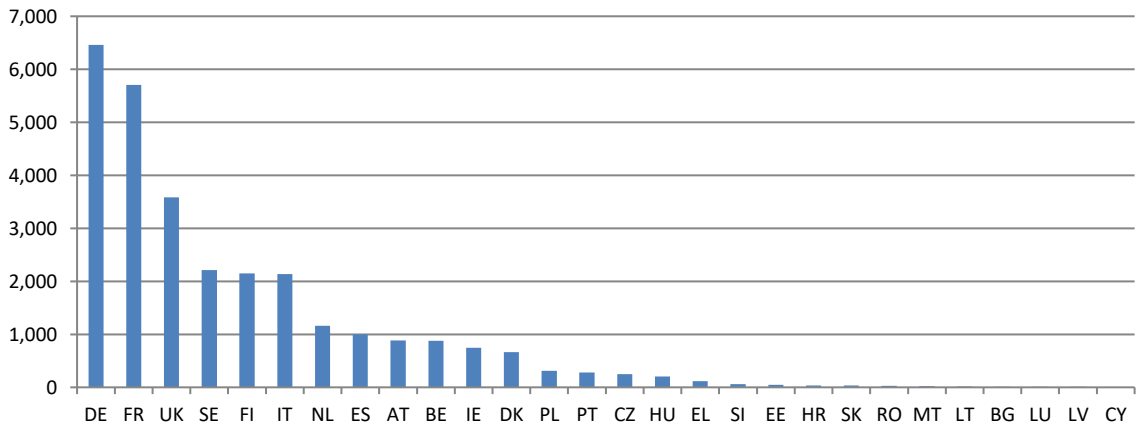


Source: European Commission, PREDICT database

R&D EXPENDITURE IN THE ICT SECTOR
by Member State

The **six main contributors** in terms of R&D expenditure in the ICT sector in 2013 were the four largest economies in the EU – Germany (€6.5 bn or 22 %), France (€5.7 bn or 20 %), the United Kingdom (€3.6 bn or 12 %) and Italy (€2.1 bn or 7.4 %), together with two Nordic countries – Sweden (€2.2 bn or 7.6 %) and Finland (€2.1 bn or 7.4 %), confirming the importance of Nordic countries for ICT R&D. Together, the six largest contributors represented 77 % of total ICT R&D expenditure in 2013.

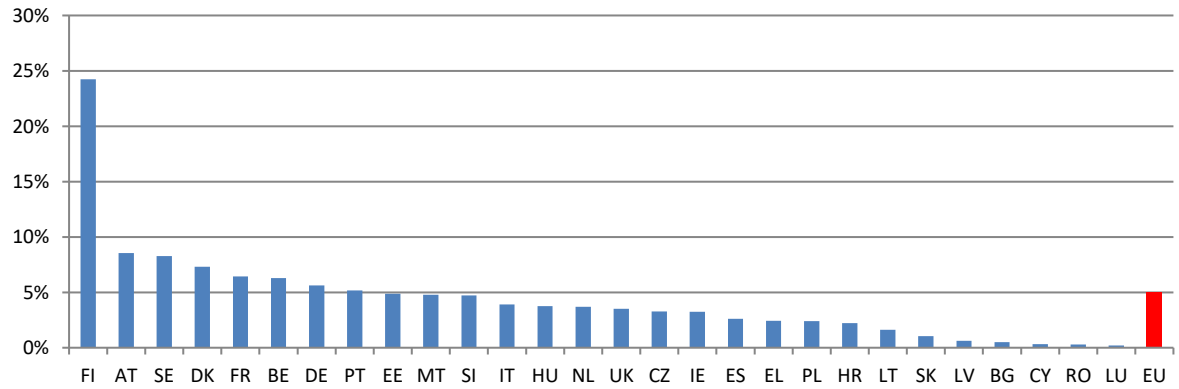
Figure 6.15: R&D expenditure in the ICT sector, 2013 (€ millions)



Source: European Commission, PREDICT database

Finland was leading the way in the EU with a 24 % ICT R&D intensity rate in 2013. Luxembourg was the poorest performer with a rate of 0.2 %. Of the Nordic countries, Sweden had a rate of 8.3 % and Denmark had a rate of 7.3 %. Other strong performers include Austria (8.6 %), France (6.4 %), Belgium (6.3 %) and Germany (5.6 %). Over the medium-term period (2006-2013), ICT R&D intensity remained broadly stable with the notable exception of Finland which saw an increase of about 8.2 pp. (from 2013-2016) owing to a sharp decline in its value added (denominator of the rate).

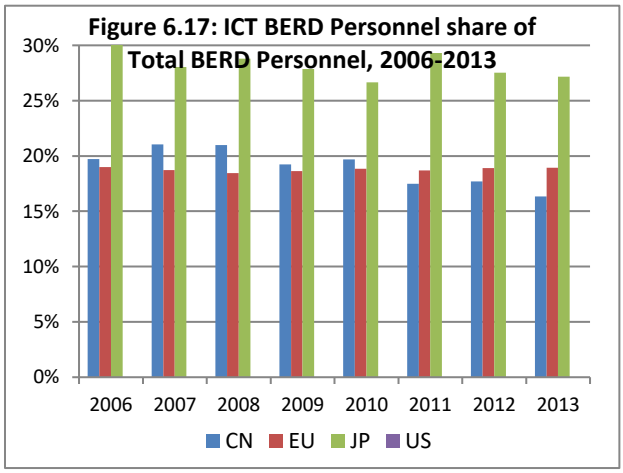
Figure 6.16: ICT R&D intensity, 2013



Source: European Commission, PREDICT database

R&D PERSONNEL IN THE ICT SECTOR
at EU and global level

R&D personnel in the ICT sector (comprehensive definition*) made up 19 % of total R&D personnel in 2013, a figure which remained stable over the medium-term period. However, the EU (19 %) and China (16 %) were behind Japan (28 %) in 2013 (comparable operational definition*, no data available for the US but the ICT/total rate for R&D researchers stood at nearly 40 %, compared with 30 % for Japan and 21 % for the EU) and over the medium-term period.

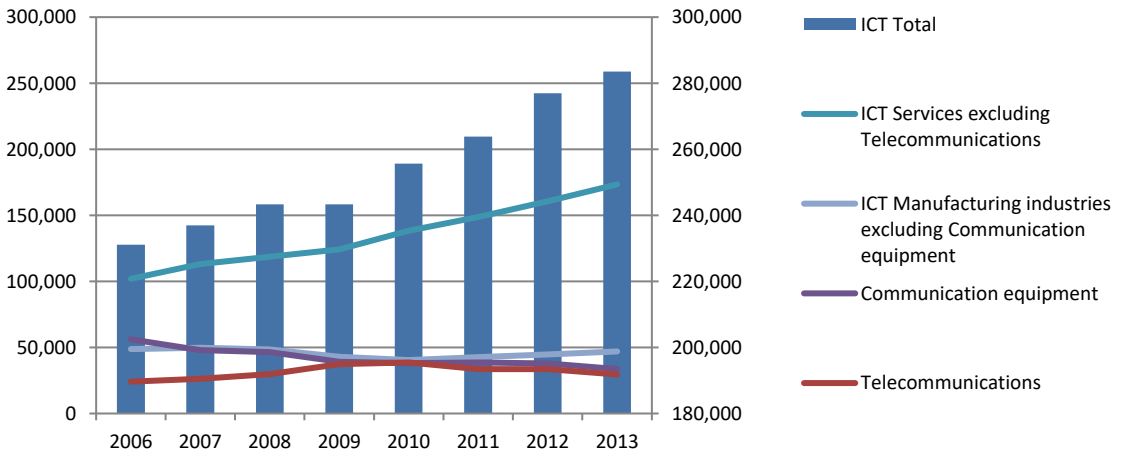


** See methodological note.*

Source: European Commission, PREDICT database

R&D personnel in the ICT sector included 284 000 full-time equivalents (FTEs) in 2013, a figure which rose over the medium-term period (2006-2013), recovering after 2009. The ICT services sector (excluding telecommunications) employed 173 000 FTEs in 2013 (61 % of R&D personnel in the ICT sector, making it the top employer), with a rising trend. The ICT manufacturing sector (excluding communications equipment) employed 47 000 FTEs in 2013, representing a fall over the medium-term (2006-2013) with signs of recovery after 2010. The communication equipment sector was in constant decline. The telecommunications sector employed 29 000 FTEs in 2013 (10 % of R&D personnel in the ICT sector), and was on a downward trend (falling 24 % from its peak of 39 000 FTEs in 2010).

Figure 6.18: ICT business R&D personnel, 2006-2013 (full-time equivalents)

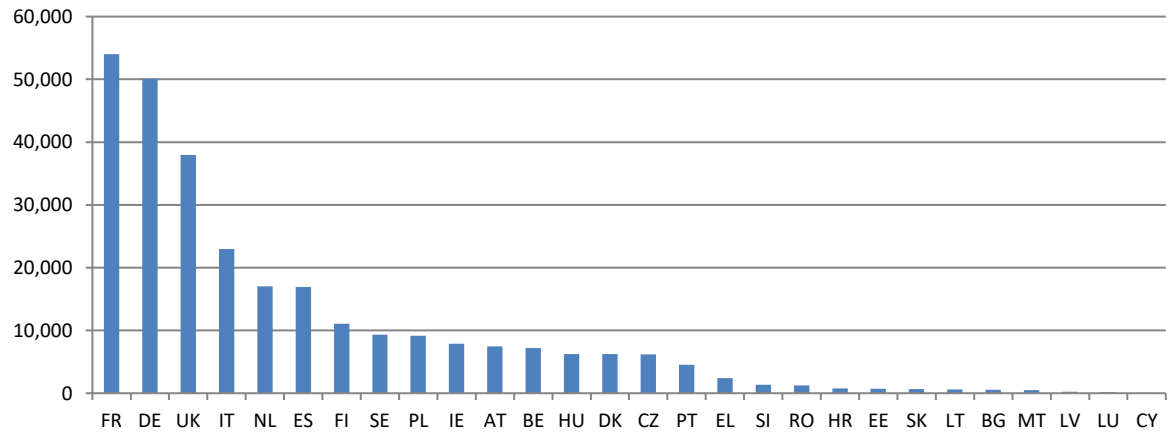


Source: European Commission, PREDICT database

R&D PERSONNEL IN THE ICT SECTOR
by Member State

The four largest economies were also the **four biggest employers** of R&D personnel in the ICT sector in 2013 – France (54 000 or 19 %), Germany (50 000 or 18 %), the United Kingdom (38 000 or 13 %) and Italy (23 000 or 8 %). Together, the four biggest employers represented 58 % of total R&D personnel in the ICT sector in 2013.

Figure 6.19: R&D personnel in the ICT sector, 2013 (full-time equivalents)

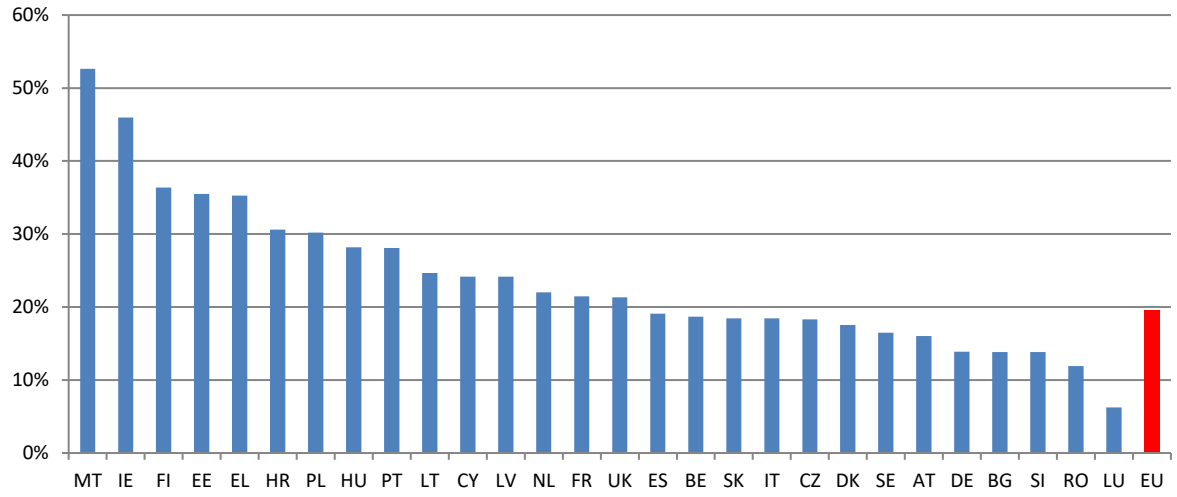


Source: European Commission, PREDICT database

Malta (53 %) and Ireland (46 %) were the two countries with the highest concentration of R&D personnel in the ICT sector in 2013. Luxembourg had the lowest concentration (less than 10 %).

Other strong performers (with between 35 % and 40 % of R&D personnel in the ICT sector in 2013) were Finland (36 %), Estonia (36 %) and Greece (35 %).

Figure 6.20: ICT BERD personnel as a share of total BERD personnel, 2013



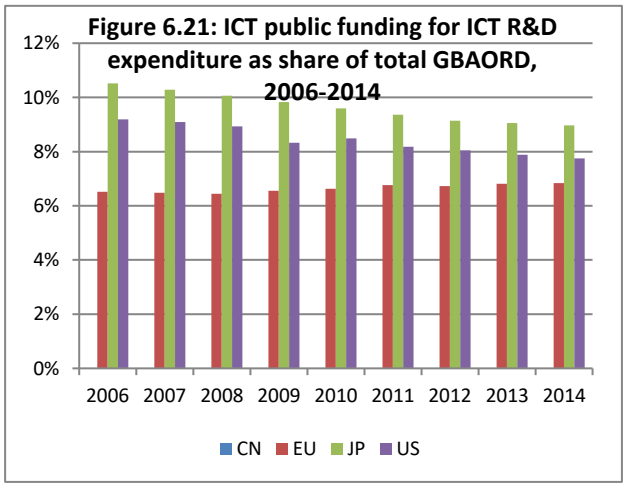
Source: European Commission, PREDICT database

PUBLIC FUNDING ICT R&D EXPENDITURE
at EU and global level

In 2014*, ICT **public funding** represented 6.8 % of EU total 'government budget appropriation or outlays for R&D' (GBAORD), a figure which remained broadly stable over the medium-term period.

** Official statistics on public expenditure are available one year before business statistics.*

The EU was lagging behind the US (7.7 %) and Japan (9.0 %), even though both those countries saw some decline in their rates (no data available for China).

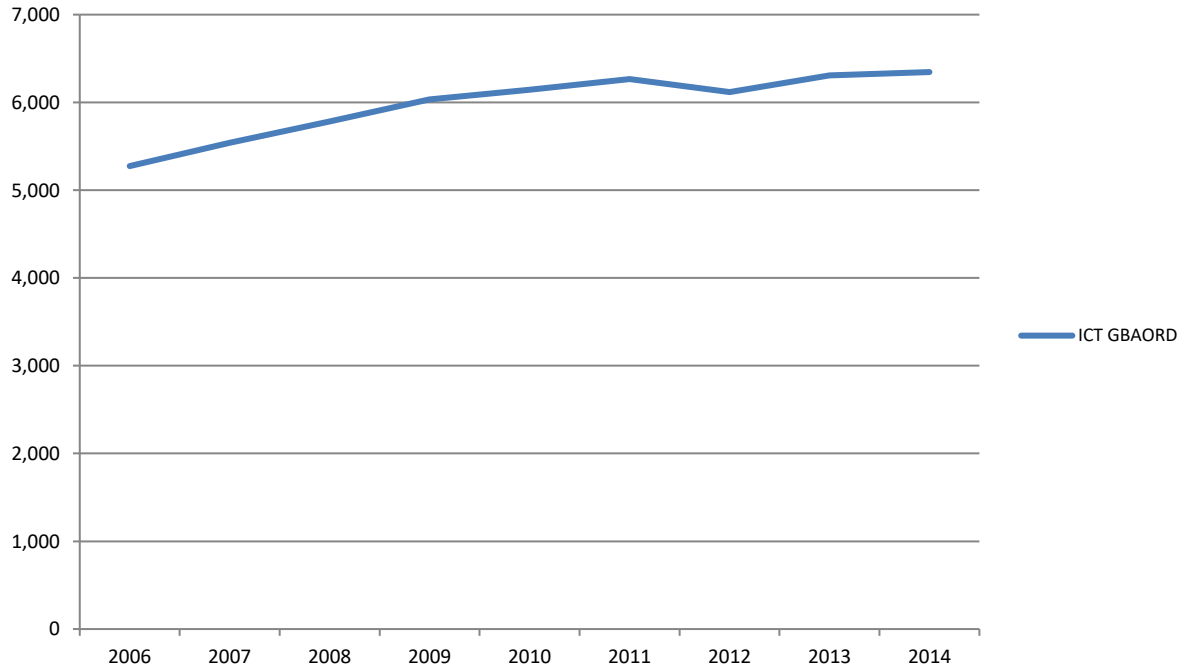


Source: European Commission, PREDICT database

After rising for several years, the estimated level of publicly funded expenditure on ICT R&D in the EU fell in 2012, but recovered in 2013, and by 2014 had exceeded its historical peak of €6.2 bn in 2011, reaching €6.3 bn.

The Digital Agenda target of doubling publicly funded R&D in ICT between 2007 and 2020 requires an annual growth rate of 5.5 % (assuming constant annual growth rate). Estimated public ICT R&D was below the necessary trend line in 2014, with a gap of about 20 %.

Figure 6.22: ICT public funding, 2006-2014 (€ millions)



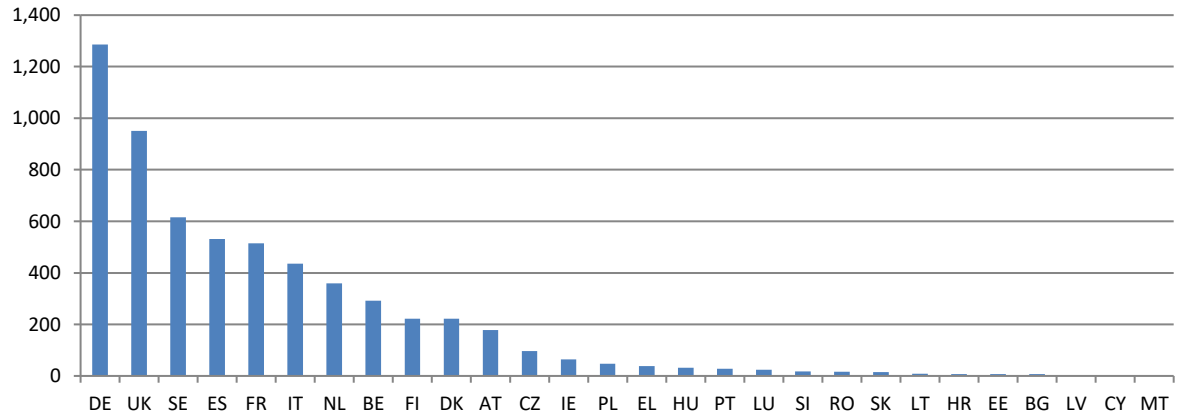
Source: European Commission, PREDICT database

PUBLIC FUNDING ICT R&D EXPENDITURE
by Member State

The **five biggest public funders** of R&D in ICT in 2014 were Germany (€1.3 bn or 21 %), followed by the United Kingdom (€0.95 bn or 16 %), Sweden (€0.62 bn or 10 %), Spain (€0.53 bn or 8.8 %) and France (€0.52 bn or 8.5 %).

Together, those five countries represented 65 % of total public funding for R&D in ICT.

Figure 6.23: public funding for ICT R&D expenditure, 2014 (€m)

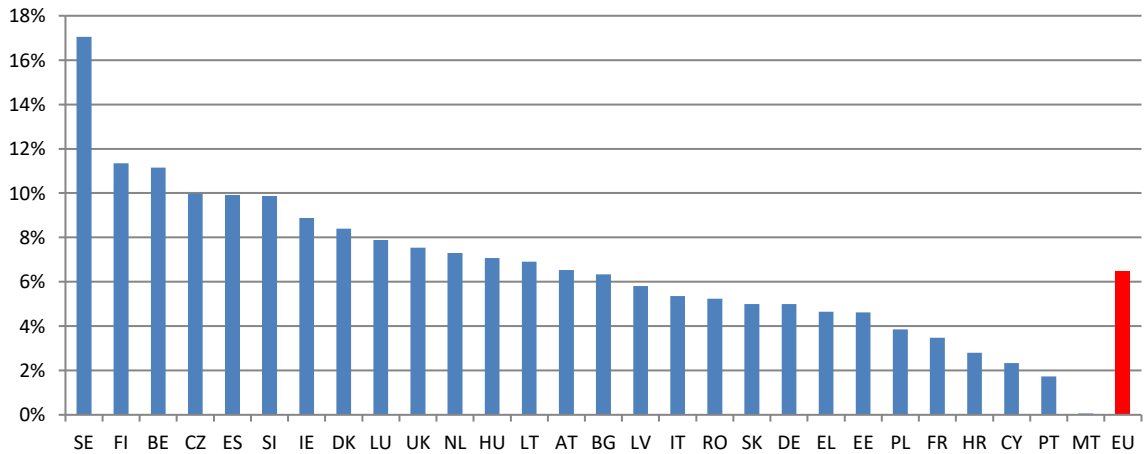


Source: European Commission, PREDICT database

The ranking of ICT GBAORD as a proportion of total GBAORD in 2014 again reveals a strong performance by Nordic countries with Sweden in first place at 17 % and Finland in second place with 11 %.

However, other countries also attribute special importance to ICT in their R&D public spending, such as Belgium (ranked third with 11 %), the Czech Republic (fourth with 10 %) and Slovenia and Spain (in joint fifth position with 9.9 %).

Figure 6.24: ICT government budget appropriation or outlays for R&D (GBAORD) as a share of total GBAORD, 2014



Source: European Commission, PREDICT database

ICT INNOVATION OUTPUT INDICATOR
Methodology

The innovation output indicator is a composite indicator that focuses on four output-oriented innovation measures (see list).

$$I_{ICT} = w_1 PCT_{ICT} + w_2 KIA_{ICT} + w_3 COMP_{ICT} + w_4 DYN_{ICT}$$

The weights *w1, w2, w3, w4* are the weights of the component indicators, fixed by time and country.

The weights are calculated in such a way that the linear correlations between each single component and the final scores of the composite indicator are almost the same (i.e. balanced). Each single weight is different from the other but the correlation coefficients are the same (or very close).

See sources (below) for further details on the methodology.

- PCT_{ICT}: patent applications per billion GDP;
- KIA_{ICT}: employment in knowledge-intensive activities in business industries as a % of total employment

KIA measures the percentage of educated (degree level) employees in each sector (i.e. is a proxy of employees' skills efficiency).

- $COMP_{ICT}$= 0.5*GOOD+0.5*SERV

GOOD: The contribution of the trade balance of high-tech and medium-tech products to the total trade balance.

SERV: Knowledge-intensive services as a share of the total services exports.

- DYN_{ICT}: employment in fast-growing firms of innovative sectors.

DYN is a measure of fast-growing firms based on the growth in the number of employees (all employees, with no distinction according to education)

Sources: JRC Technical report – *How much does ICT contribute to innovation output? An analysis of the ICT component in the innovation output indicator*, Annarosa PESOLE, 2015

'Developing an indicator of innovation output', Commission Staff Working Document – SWD (2013) 325 final.

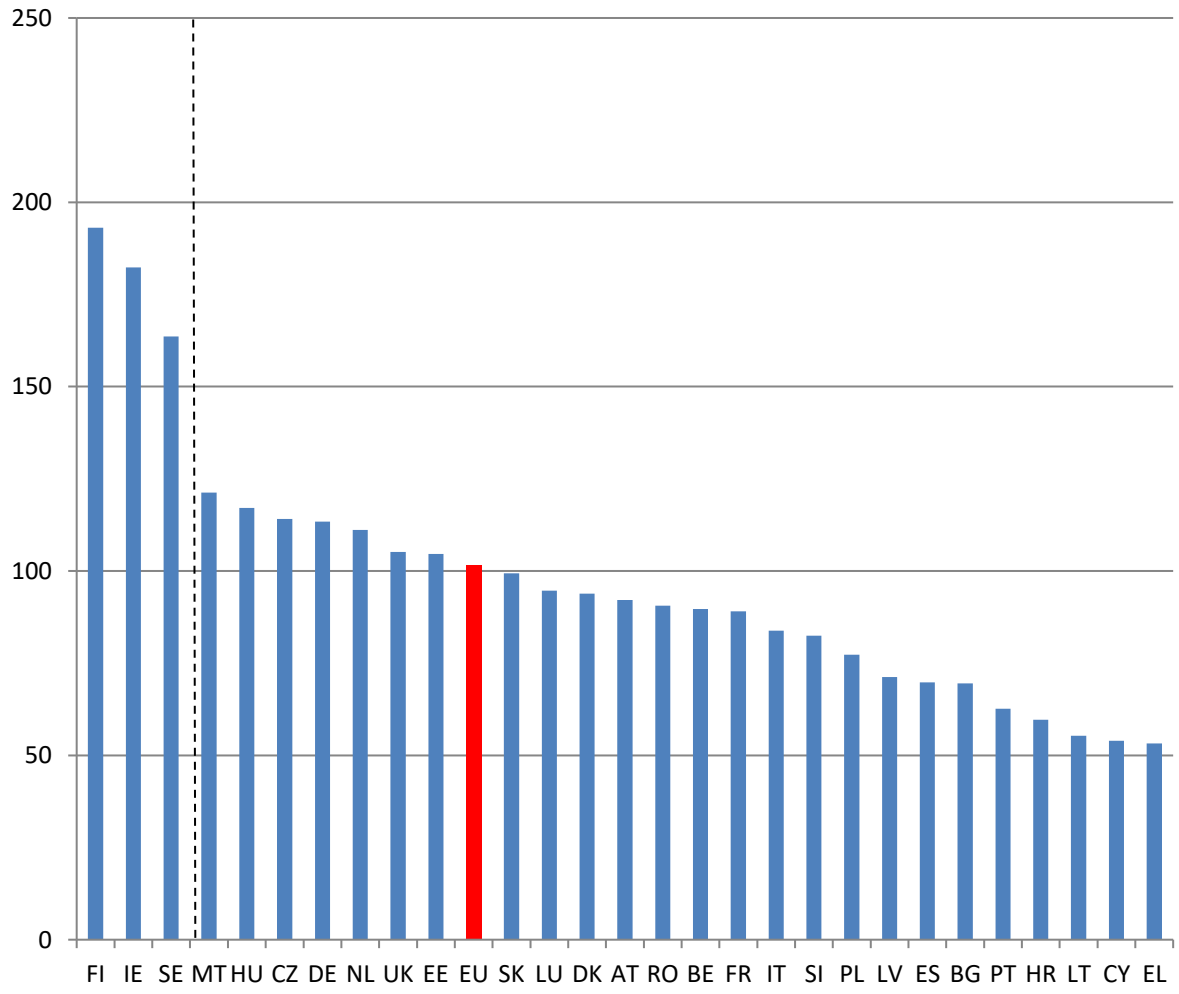
ICT INNOVATION OUTPUT INDICATOR
by Member State

A group of three countries takes a significant lead with scores above 150 (the benchmark was been set to equal 100 for Europe in 2011): Finland (193), Ireland (182) and Sweden (164).

The three top scores in ICT innovation output result from very high ICT contributions in the trade of knowledge-intensive services, above average levels of fast-growing innovative ICT employment for Ireland and remarkable results for ICT patenting in Finland and Sweden.

At the lowest end of the scale are Lithuania (with a score of 55), Cyprus (54) and Greece (53).

Figure 6.25: ICT output Indicator, 2013



Source: European Commission, EURIPIDIS database

ICT INNOVATION OUTPUT INDICATOR
by Component

The contribution of ICT has been calculated for each underlying component of the innovation output indicator. The ICT contributions for Europe are:

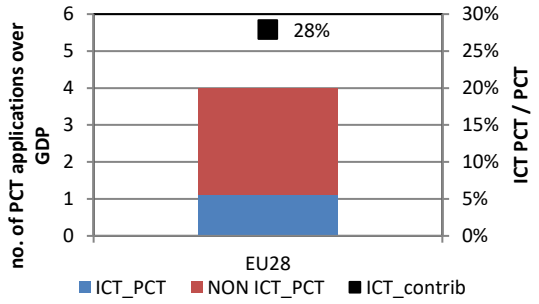
1. 28 % in technological innovation as measured by patents (PCT_ICT).

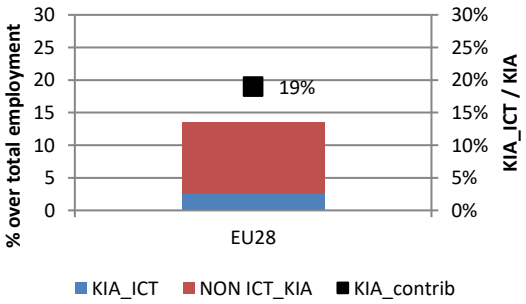
2. 19 % in absorption of skills as measured by employment in knowledge-intensive activities (KIA_ICT).

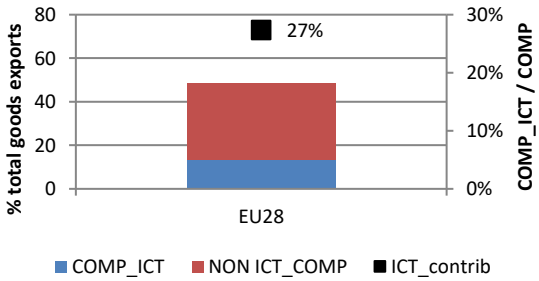
3. 27 % in competitiveness of knowledge goods as measured by exports of medium-high-tech goods (COMP_GOOD_ICT).

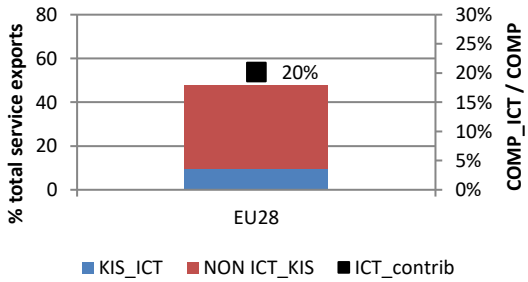
4. 20 % in competitiveness of knowledge services as measured by exports of knowledge-intensive services (KIS_ICT).

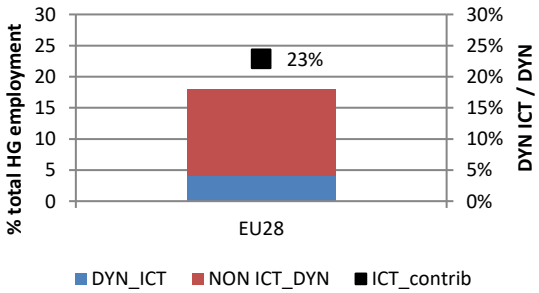
5. 23 % in innovative firms' dynamics as measured by employment of innovative fast-growing firms (DYN_ICT)









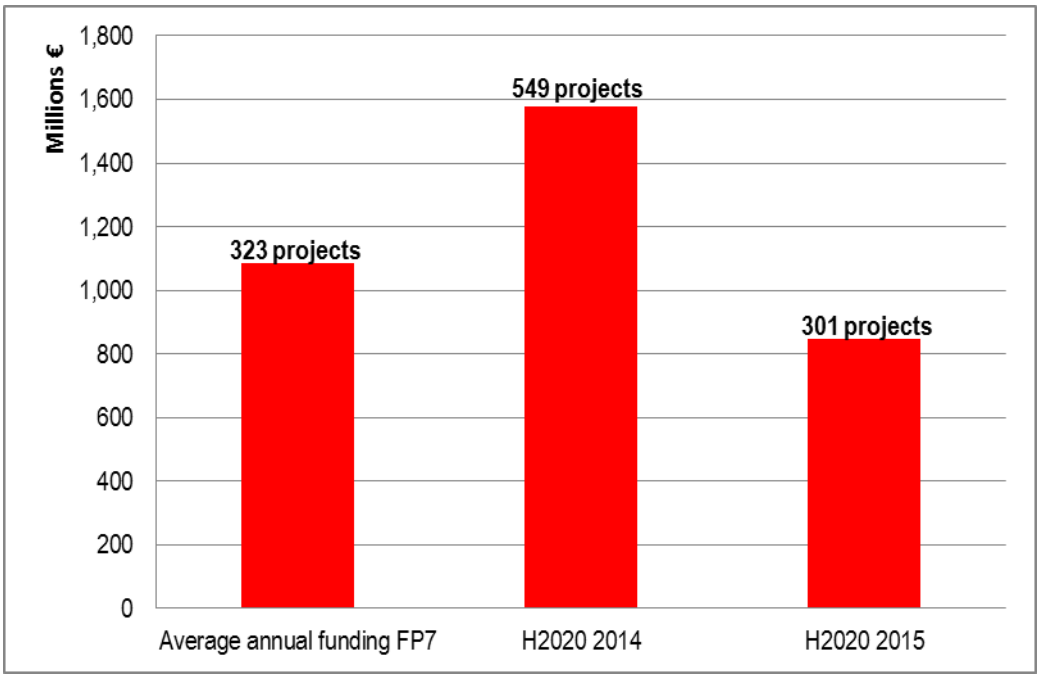


Research and Innovation – ICT projects in Horizon 2020

In its first two years of implementation, Horizon 2020 has allocated €2.4 billion of EU funding to 850 projects in the field of ICT, attracting 3 312 organisations.

Annual funding has increased compared with the previous Framework Programme, FP7, where average annual funding was €1.08 billion a year.

Figure 6.26: EU funding and projects funded, 2014 and 2015 (H2020) and annual average FP7



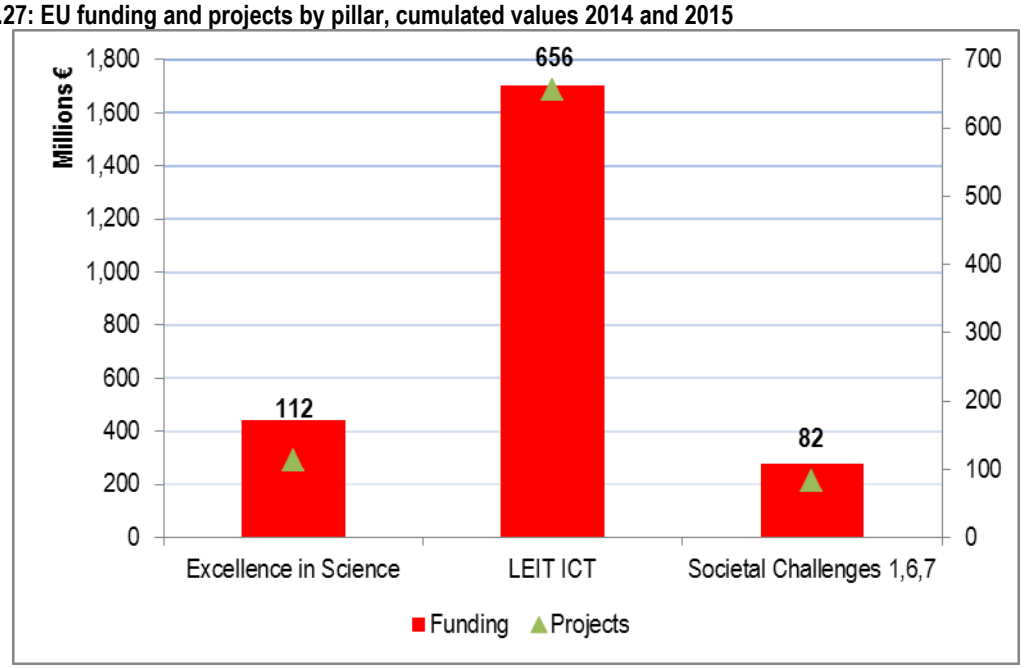
Source: European Commission, CORDA database

Leadership in Enabling and Industrial Technologies (LEIT)-ICT (including the Open Disruptive Innovation (ODI) scheme funded through the SME instrument) accounts for the majority of funding (70 %), participations (67 %) and projects (77 %). **Excellent Science**[1] accounts for about one fifth of the budget (18 %) and participations (20 %) and 13 % of projects. **Societal Challenges** 1.6 and 7 account for 12 % of the budget, 10 % of projects and 13 % of participations.

The number of **participants** has also increased in comparison with FP7, where on average 1 830 legal entities took part every year. 37 % of participants are new compared to FP7, and of these, the vast majority (80 %) are private for-profit organisations. H2020 has so far been able to attract 661 **new SMEs**.

[1] e-Infrastructures, Future Emerging Technologies (FET) Open, FET Proactive, FET Flagships and High Performance Computing.

Figure 6.27: EU funding and projects by pillar, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

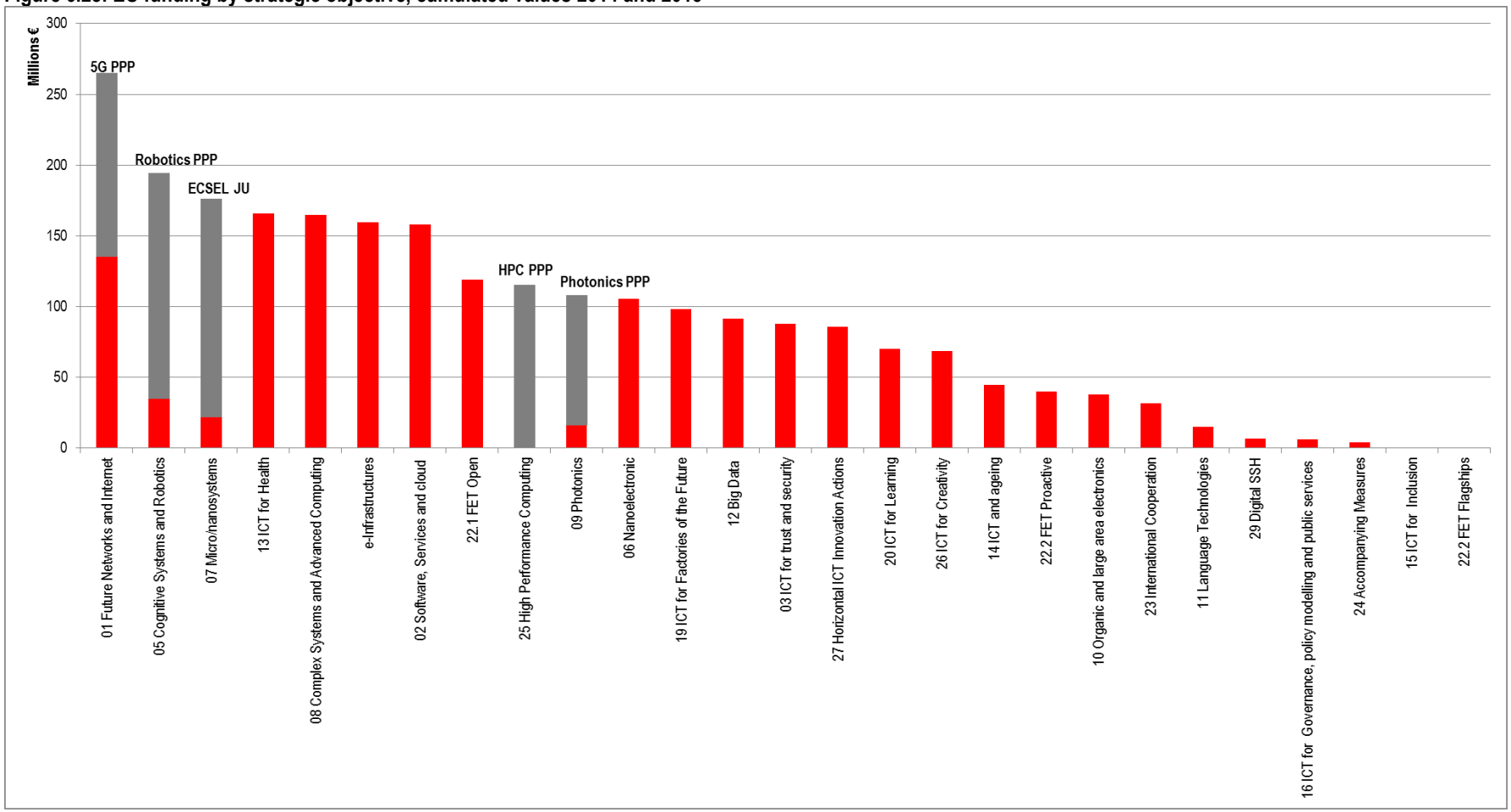
Future Networks and Internet and the Cognitive systems and Robotics are the areas that attract the highest number of participants and funding.

Within the strategic objective 'Future Networks and Internet', the contractual **Private Public Partnership** (PPP) **for 5G** accounts for €130 million. Within 'Cognitive Systems and Robotics', funding from the European Commission to the **Robotics PPP** amounts to €160 million. In third place, the strategic objective 'Micronanosystems' includes funding for the **Electronic Components and Systems for European Leadership** (**ECSEL**) **Joint Undertaking** of €154 million. The other newly launched PPPs in H2020, **High Performance Computing** (**HPC**) and **Photonics** account for €115 and €92 million, respectively.

Within the **Societal Challenges**, 'ICT for Health' and 'ICT for Trust and Security' are the strategic objectives with the highest funding, at €166 million and €88 million, respectively.

'Complex systems and advanced computing' has total funding of €166 million, closely followed by e-Infrastructures with €160 million. Within Horizontal ICT Innovation Actions, the **ODI Scheme** allocated €9.8 million to 197 projects for the Phase I, and €63.7 million to 41 projects in Phase II.

Figure 6.28: EU funding by strategic objective, cumulated values 2014 and 2015

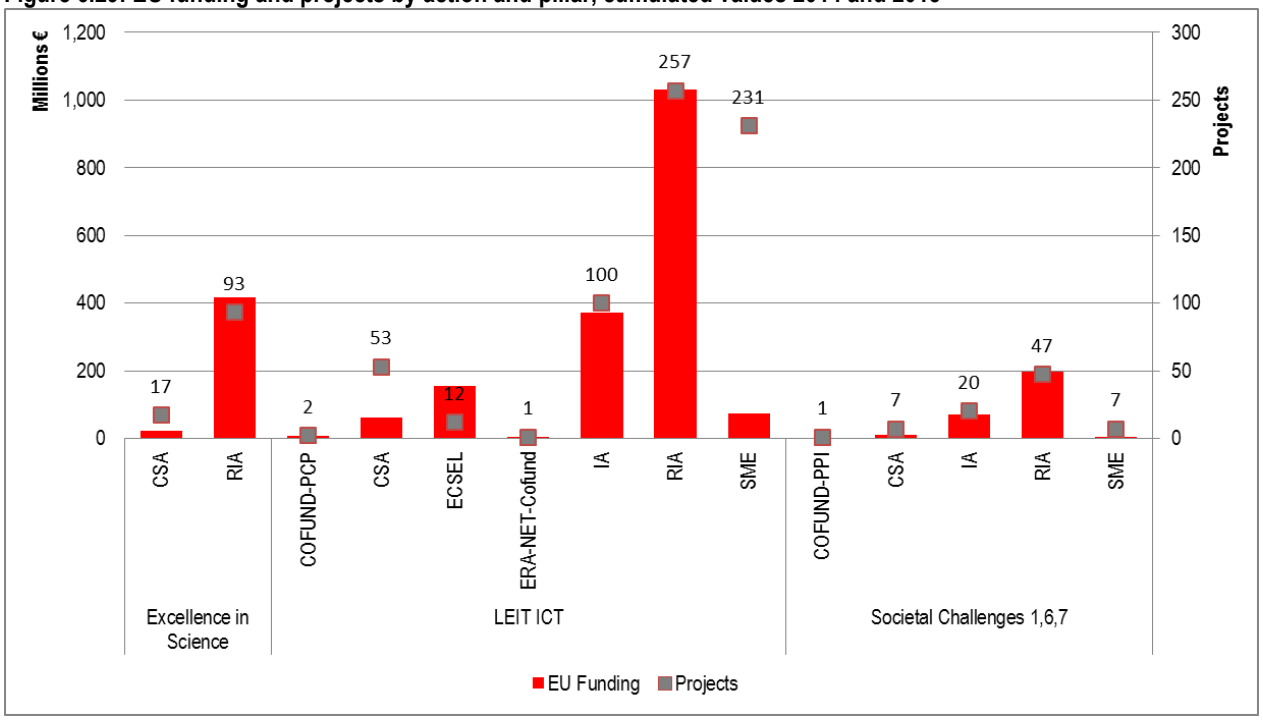


Source: European Commission, based on CORDA

Research and innovation actions are the prevailing type of action

Research and innovation actions account for **68 % of funding**, 58 % of participations and 47 % of projects. **Innovation actions** follow, with **18 % of funding** and participations and 14 % of projects. **Coordination and support actions** account for 9 % of projects, 10 % of participations and 4 % of funding. The **ODI Scheme** (funded through the SME instrument) accounts for 28 % of projects, and 3 % of funding.

Figure 6.29: EU funding and projects by action and pillar, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

The **average project size** differs by pillar, with projects averaging as much as €18.2 million in the Electronic Components and Systems for European Leadership joint undertaking (ECSEL JU) within LEIT-ICT and €13 million in e-Infrastructures for Big Data. Projects within LEIT-ICT have an average size of €3.5 million.

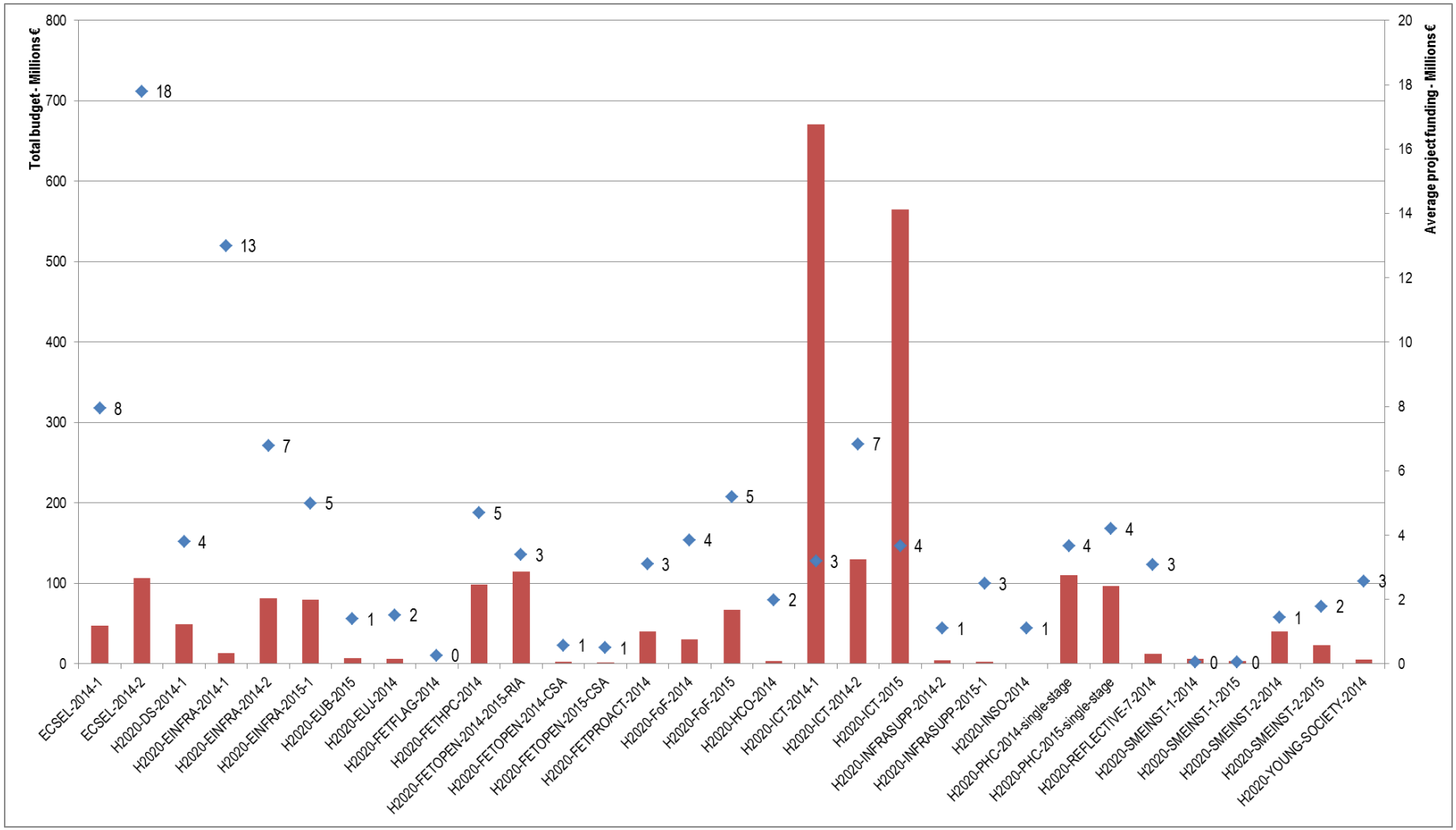
Projects size within Societal Challenges 1.6.7 range from of €700 000 to €4.2 million per project.

Phase II of the ODI Scheme has an average funding of €1.7 million.

The average size of coordination and support actions is €1.2 million, slightly lower than under FP7 (€1.3 million).

Under FP7 the average project value was €3.38 million – specific targeted research projects had an average value of €2.2 million and large-scale integrating collaborative projects had an average value of €7.95 million.

Figure 6.30: Total budget and average project funding by call, 2014 and 2015

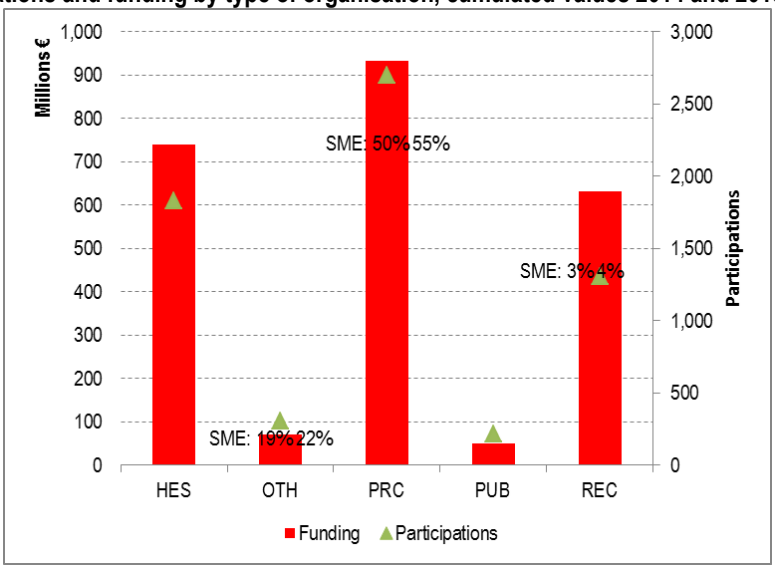


Source: European Commission, based on CORDA

Under H2020 the enterprise sector shows an increase in participation compared with FP7, accounting for 42 % of participations and 38 % of the budget, with 21 % of the budget going to SMEs.

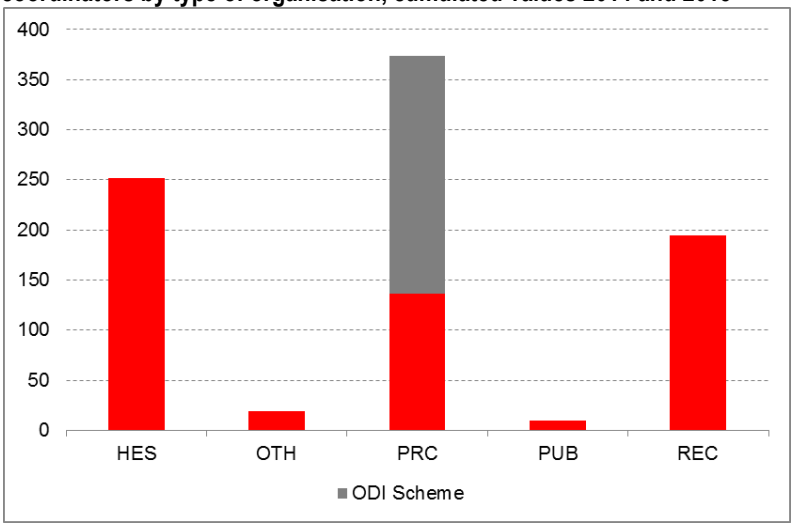
Secondary and higher education establishments and **research organisations** taken together account for **half of all project participations** (50 %) and receive the **highest funding** (56 %). Still the main beneficiaries of ICT under H2020, their relative size has however decreased in comparison with FP7 (average figures), where they accounted for 57 % of participations and 64 % of the budget. Conversely, there has been an increase in enterprise participation, with private for-profit companies' organisations accounting for 38 % of the budget and 42 % of participations, up from 33 % and 35 %, respectively, under FP7. Funding for SMEs has also increased, from 15 % to 21 %, along with the share of SME participations, which has risen from 16 % to 25 %.

Figure 6.31: Participations and funding by type of organisation, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

Figure 6.32: Project coordinators by type of organisation, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

PRC: Private for-profit companies
PUB: public bodies (excluding research and education)
REC: research organisations
HES: secondary and higher education establishments
OTH: other entities

Secondary and higher education establishments and **research organisations** coordinate 53 % of the projects, followed by private for-profit companies (44 %), with 36 % of projects coordinated by SMEs. This is however influenced by the number of ODI scheme projects. In the other areas, the share of projects coordinated by SMEs is slightly lower than under FP7, at 9 % (it was 10 % under FP7), but large enterprises coordinate a lower share of projects (16 %) compared with 18 % under FP7.

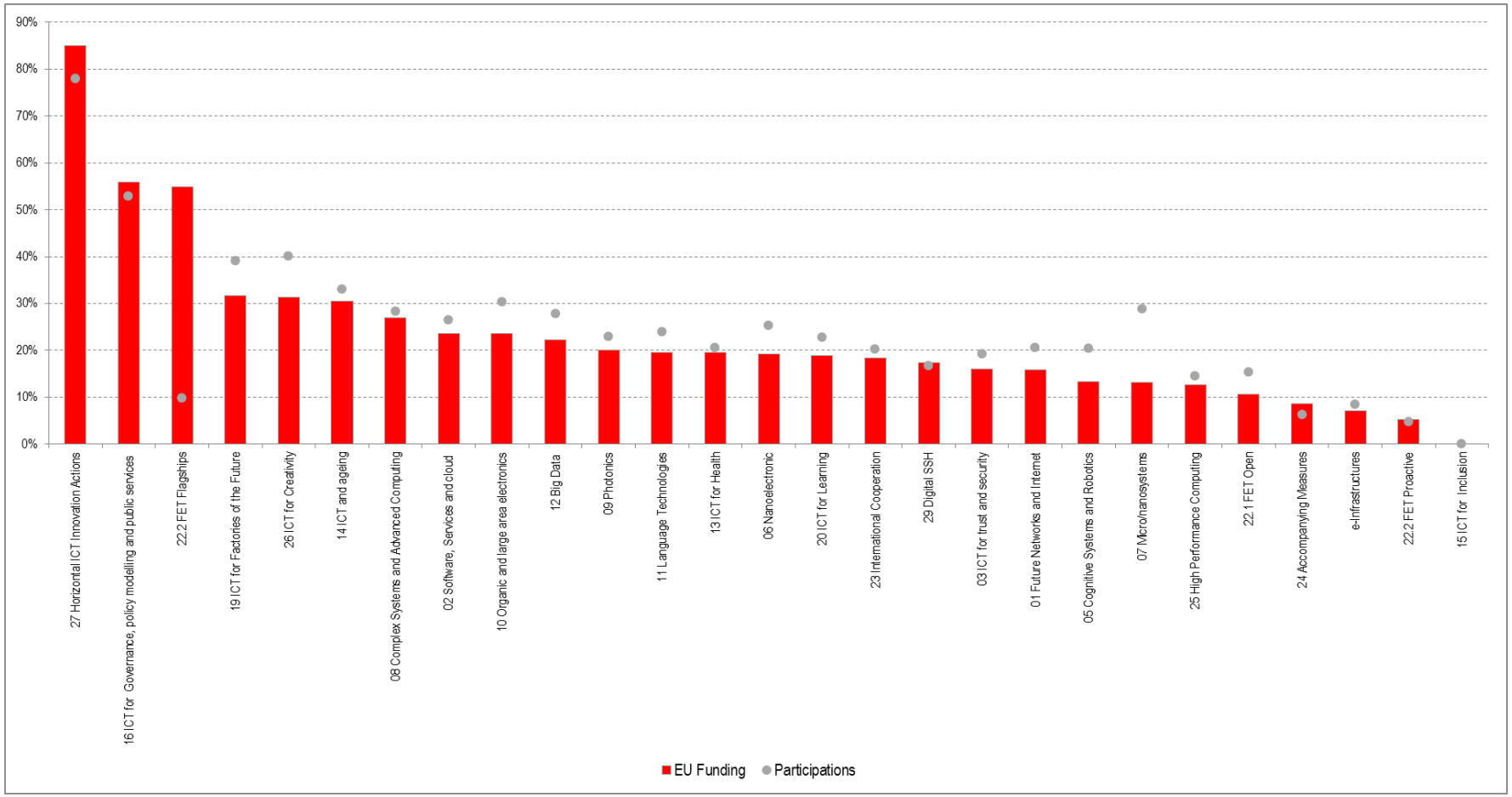
SMEs are especially present in the research area Horizontal ICT Innovation Actions and within Societal Challenge 6 in ICT for Governance, policy modelling and public services.

SMEs are more than one third (39 %) of the participating organisations and their participation varies according to pillar and strategic objective. Beyond the 'Horizontal ICT IAs', where the presence of SMEs is prevalent due to the ODI Scheme, SMEs are present in the future and emerging technologies (FET) flagships and the ICT part of 'Factories of the Future'. They are also very present in Societal Challenges, such as 'ICT for Creativity' and 'ICT and Ageing'. SMEs are also present in LEIT research areas, such as 'Complex Systems and advanced computing' and 'Software, Services and Cloud'.

They are particularly weak in 'e-Infrastructures' and 'FET Proactive' (7 % and 5 % of funding, 5 % of participations). As for the public-private-partnerships and the joint undertakings, the presence of SMEs ranges from 11 % in robotics, to 13 % in HPC and in ECSEL, to 17 % in 5G and 21 % in Photonics.

In certain Member States, SMEs account for the large majority of the total funding going to the country – in Estonia the share is 83 %, in Latvia 65 %, in Slovakia 55 % and in Hungary 50 %.

Figure 6.33: Incidence of SMEs by strategic objective (as % of total funding and participations), cumulated values 2014 and 2015

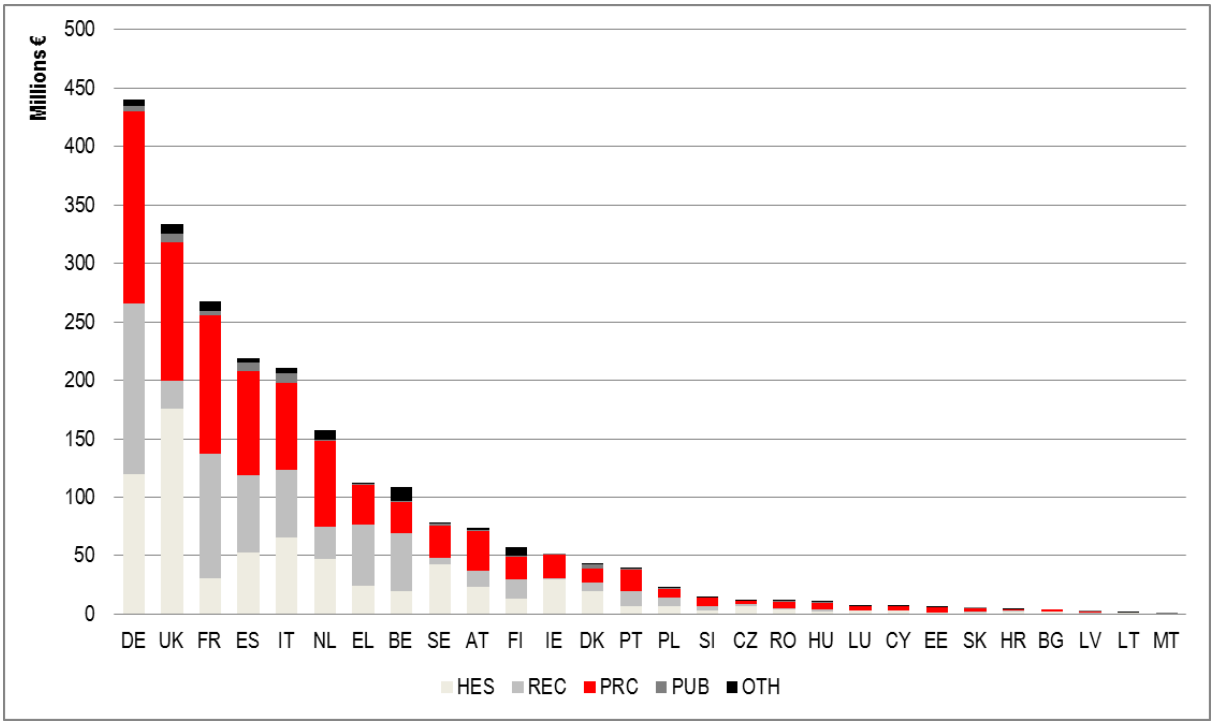


Source: European Commission, based on CORDA

In absolute terms, Germany and the United Kingdom are the biggest recipients of EU funding, but Greece and Slovenia are the countries with the highest funding in relation to the size of their ICT sector.

Germany, the United Kingdom, France, Spain and Italy account for 64 % of total EU funding and 62 % of participations in the first two years of H2020. These countries also lead in terms of projects coordinated (62 %), with Spain ranked in first position.

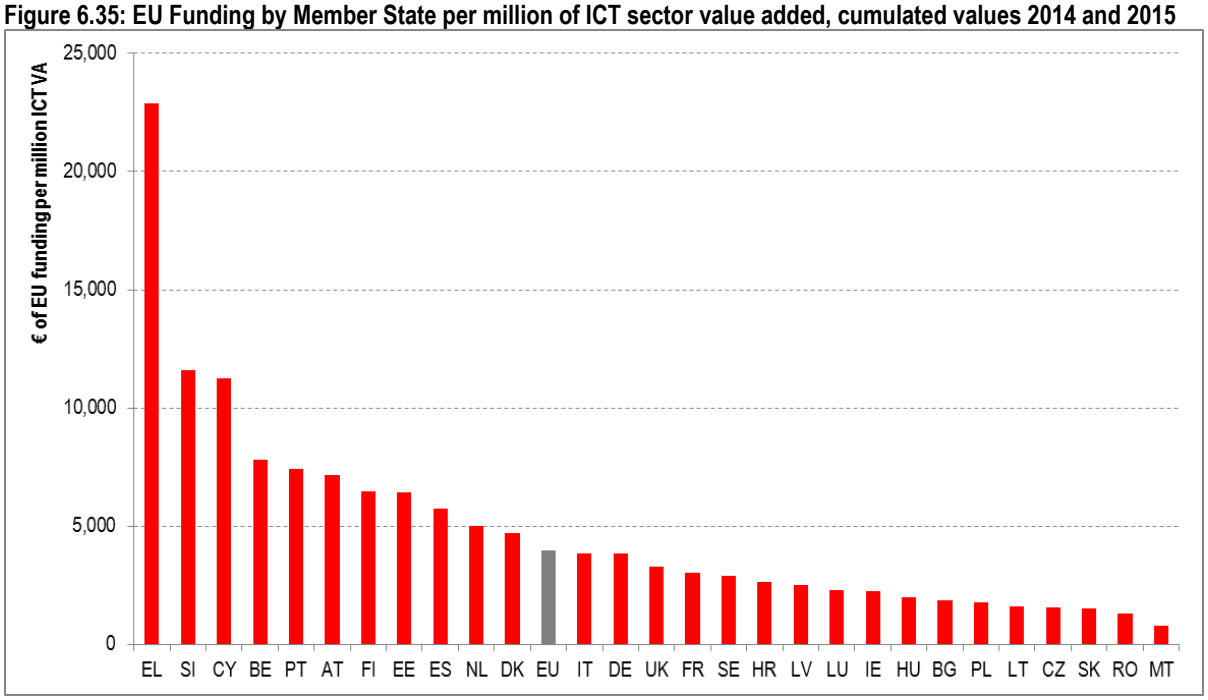
Figure 6.34: EU funding by Member State and type of participant organisation, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

Cyprus, Belgium and Portugal are also among the Member States with the highest amounts of funding compared to the size of their ICT sector.

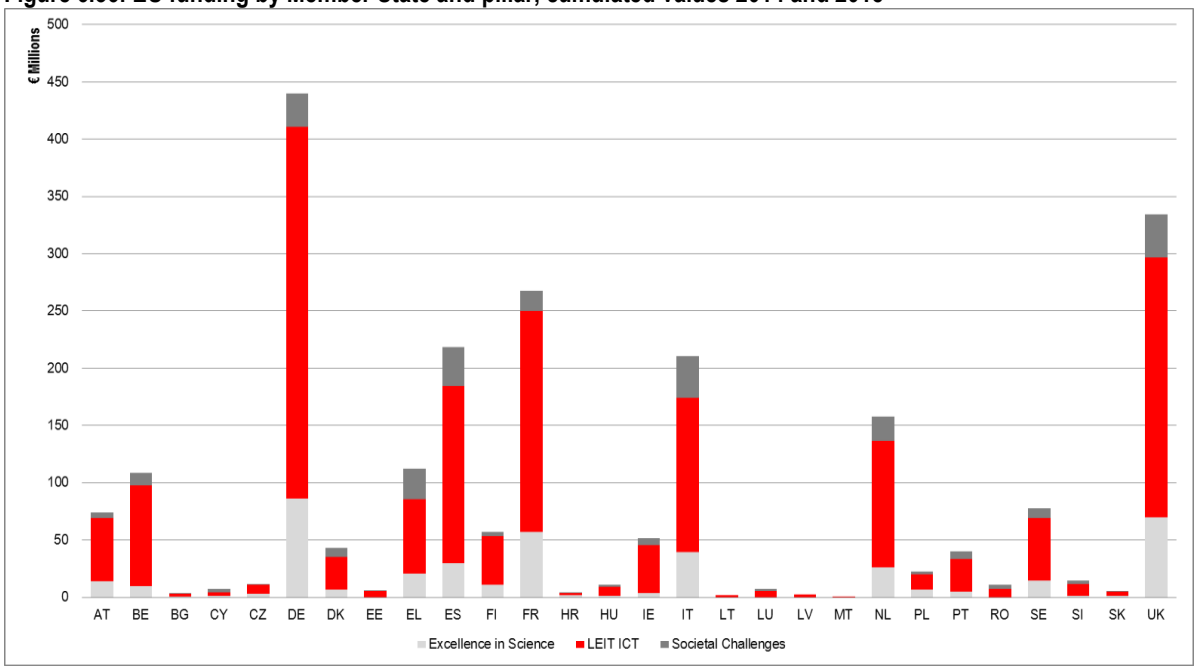
Figure 6.35: EU Funding by Member State per million of ICT sector value added, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

When looking at the total funding by country and its distribution among H2020 pillars, it is notable that in all the countries the majority of funding (out of the total funding for the country) is allocated to LEIT-ICT, ranging from the lowest level at 39 % for Hungary, to 93 % for Lithuania and the highest level of 97 % for Latvia. In Hungary, 47 % of funding goes to Excellent Science whereas in Poland this figure is 31 %. In Cyprus and Romania, 36 % and 34 % respectively of funding is allocated to Societal Challenges.

Figure 6.36: EU funding by Member State and pillar, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

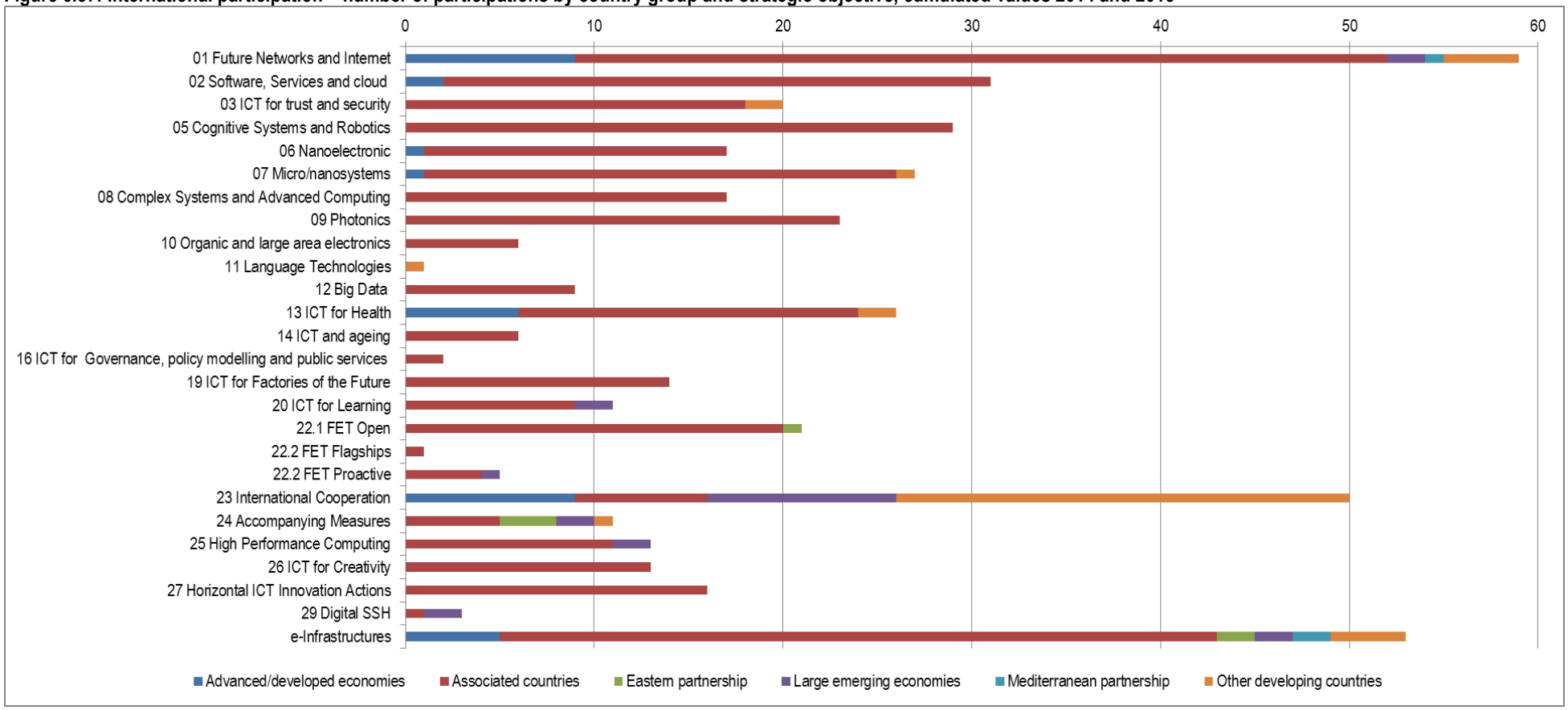
95 % of EU funding in H2020 is allocated to EU Member States, followed by associated countries. Third countries take part in the Research Programme but with little EU funding (1 %).

In 2014 and 2015, 315 organisations from countries other than the Member States participated in 517 projects.
About 5 % of participations and funding is allocated to associated countries, mainly due to the presence of research-oriented players such as Norway, Israel and Switzerland.

The rest of budget and participations are equally distributed among other third countries.

Most of the projects with international participants fall under the specific objectives 'Future Networks and internet' (36 projects), 'Software, Services and cloud' (24 projects), 'Cognitive systems and robotics' (20 projects), 'e-Infrastructures' (18 projects), 'Photonics' and 'ICT for Health' (17 projects), 'Complex systems and advanced computing' (14 projects), 'ICT for trust and security (13 projects).

Figure 6.37: International participation – number of participations by country group and strategic objective, cumulated values 2014 and 2015



Source: European Commission, based on CORDA

Note

This report covers all the projects signed by 31 December 2015.
Annual comparisons (2014 and 2015) are made by considering projects signed by 31 December of the relevant year.

The following country groups are used for the chart on international participation (Figure 6.37):

- associated countries (art. 7 of 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;
- advanced/developed economies: the US, Japan, Canada, Australia, New Zealand, Korea, Singapore;
- large emerging economies – BRICS (Brazil, Russia, India, China and South Africa); Mexico, Indonesia, Nigeria and Turkey (the MINT group), South America (Argentina, Chile, Uruguay, Colombia);
- Eastern Partnership – Ukraine, Belarus, Armenia, Azerbaijan, Georgia;
- Mediterranean Partnership – Morocco, Algeria, Tunisia, Libya, Egypt, Lebanon, Jordan, Syria;
- other developing countries – all other third countries.

Source: this report is based on CORDA data produced by the European Commission — DG CONNECT.

The source of data for ICT value added is PREDICT.

Correspondence strategic objectives, calls and H2020 pillars

Pillar	Strategic Objective	Call
Excellence in Science	22.1 FET Open	H2020-FETOPEN-2014-2015-RIA
		H2020-FETOPEN-2014-CSA
		H2020-FETOPEN-2015-CSA
	22.2 FET Flagships	H2020-FETFLAG-2014
	22.2 FET Proactive	H2020-FETPROACT-2014
	23 International Cooperation	H2020-INFRASUPP-2014-2
	25 High Performance Computing	H2020-FETHPC-2014
	e-Infrastructures	H2020-EINFRA-2014-1
		H2020-EINFRA-2014-2
		H2020-EINFRA-2015-1
		H2020-INFRASUPP-2015-1
LEIT-ICT	01 Future Networks and internet	H2020-ICT-2014-1
		H2020-ICT-2014-2
		H2020-ICT-2015
	02 Software, Services and cloud	H2020-ICT-2014-1
		H2020-ICT-2015
	03 ICT for trust and security	H2020-ICT-2014-1
	05 Cognitive Systems and Robotics	H2020-ICT-2014-1
		H2020-ICT-2015
	06 Nanoelectronic	H2020-ICT-2015
	07 Micro/nanosystems	ECSEL-2014-1
		ECSEL-2014-2
		H2020-ICT-2015
	08 Complex systems and advanced computing	H2020-ICT-2014-1
		H2020-ICT-2015
	09 Photonics	H2020-ICT-2014-1
		H2020-ICT-2015
	10 Organic and large area electronics	H2020-ICT-2014-1
	11 Language Technologies	H2020-ICT-2014-1
	12 Big Data	H2020-ICT-2014-1
		H2020-ICT-2015
	19 ICT for Factories of the Future	H2020-FoF-2014
		H2020-FoF-2015
	20 ICT for Learning	H2020-ICT-2014-1
		H2020-ICT-2015
	23 International Cooperation	H2020-EUB-2015
		H2020-EUJ-2014
		H2020-ICT-2015
	24 Accompanying Measures	H2020-ICT-2014-1
	26 ICT for Creativity	H2020-ICT-2014-1
		H2020-ICT-2015
	27 Horizontal ICT Innovation Actions	H2020-ICT-2014-1
		H2020-ICT-2015
		H2020-SMEINST-1-2014
		H2020-SMEINST-1-2015
		H2020-SMEINST-2-2014
		H2020-SMEINST-2-2015
	29 Digital SSH	H2020-ICT-2014-1

Societal Challenges	03 ICT for trust and security	H2020-DS-2014-1
	13 ICT for Health	H2020-HCO-2014
		H2020-PHC-2014-single-stage
		H2020-PHC-2015-single-stage
	14 ICT and ageing	H2020-HCO-2014
		H2020-PHC-2014-single-stage
	15 ICT for Inclusion	H2020-INSO-2014
	16 ICT for Governance, policy modelling and public services	H2020-SMEINST-1-2015
		H2020-SMEINST-2-2015
		H2020-YOUNG-SOCIETY-2014
	26 ICT for Creativity	H2020-REFLECTIVE-7-2014