



HORIZON 2020

in full swing

Three years on

KEY FACTS AND FIGURES 2014-2016



Research and
Innovation

HORIZON 2020 IN FULL SWING — Three Years On - *Key facts and figures 2014-2016*

Directorate-General for Research and Innovation
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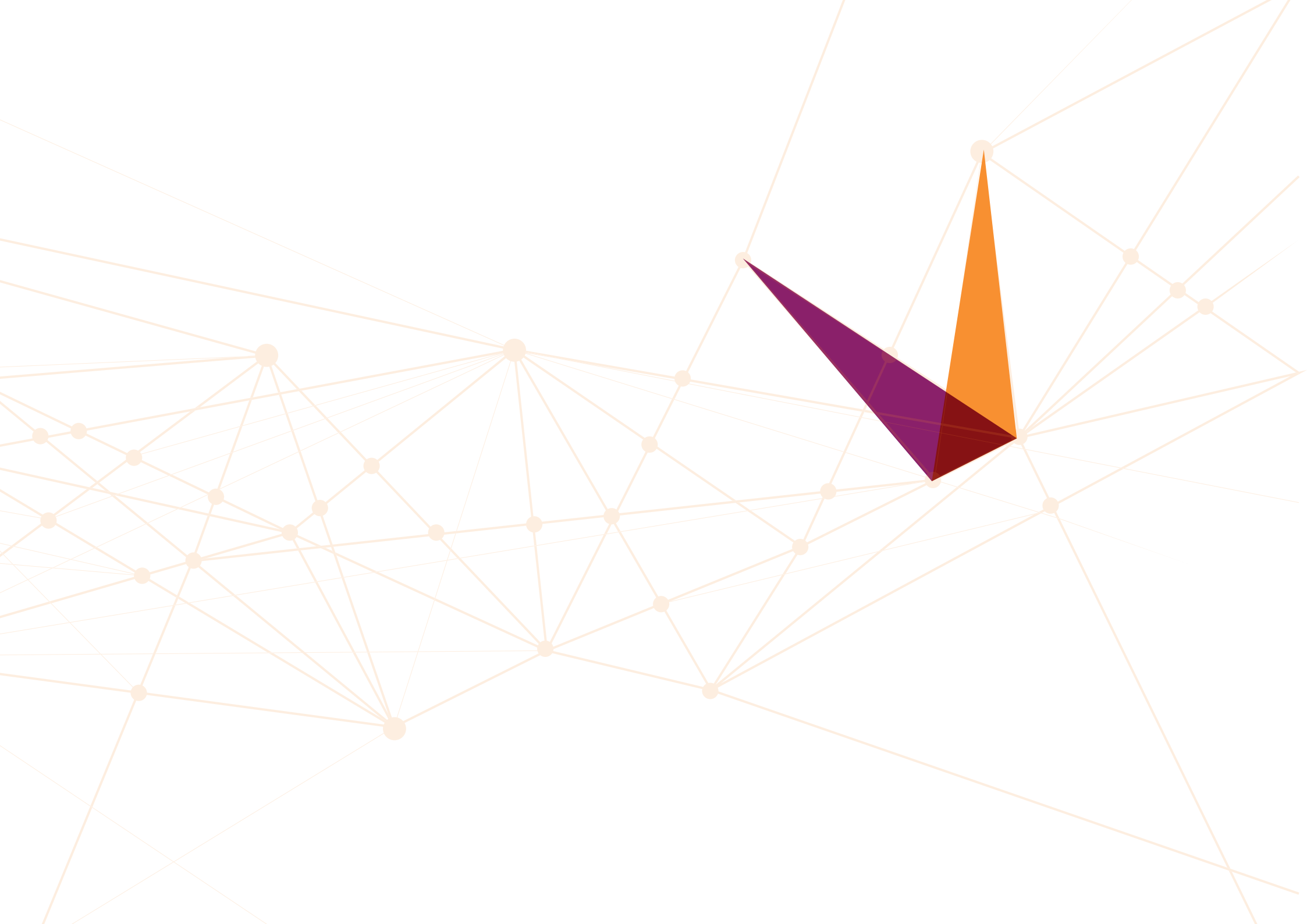
EUROPEAN COMMISSION

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The recent interim evaluation of Horizon 2020 confirmed that the programme is highly successful and well on track to achieve its objectives: stimulating excellent science, building industrial leadership, and providing solutions to the challenges that our society faces. In doing this, Horizon 2020 is an important contributor to the Juncker Commission priorities.

This brochure provides a snapshot of the programme's main achievements after three full years of implementation (2014-2016). For the first time, some early trends can be glimpsed from the year-on-year evolution of key monitoring data such as success rates, SME participation, and project evaluation. We take heart from the clear indications of its attractiveness and accessibility. Some 55% of applicants are newcomers, and the share of funding awarded to SMEs surpassed the 20% target. Continuing efforts to simplify the programme are paying off, with a shorter average time now taken to sign grants than ever before.

The quality of applications is also striking – a very high proportion of proposals are assessed as high-quality by independent evaluators. Horizon 2020 would have required an extra EUR 66.3 billion in order to fund all the high-quality proposals received so far.

Three years on, a closer look at the results and project examples illustrated in this brochure clearly show the enormous potential in Europe for excellent research and innovation, and how in turn this can have a real impact on our economy and society. We will work hard to ensure that Horizon 2020 can be even more successful during the second half of its lifetime, paving the way for the successor programme due to start in 2021.



Carlos Moedas,
Commissioner for Research,
Science and Innovation.

A handwritten signature in black ink, appearing to read 'Carlos'.

A handwritten signature in black ink, appearing to read 'R. Smits'.

Robert-Jan Smits,
Director-General,
Directorate-General for Research and Innovation,
European Commission.



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1

INTRODUCTION



Horizon 2020 is the European Union's Framework Programme for Research and Innovation (2014-2020). With its dedicated budget of around EUR 77 billion over seven years, it is the biggest EU Research and Innovation programme ever. This brochure provides an overview of the state of play after three years of implementation¹. The key findings are:

> **EU research and innovation remains attractive and relevant:**

- A total of 115 235 eligible proposals were submitted under Horizon 2020 calls, requesting a total EU financial contribution of EUR 182.4 billion. This represents close to 400 000 applications.
- The overall success rate of eligible full proposals is 12.6%. Almost half of the eligible proposals were evaluated by independent experts as being of high-quality. However, out of these high-quality proposals, only one in four was funded.
- Overall 13 903 grant agreements were signed, with an EU contribution of EUR 24.8 billion.

> **Simplification efforts pay off:** 90.5% of grant agreements were signed within the target timeframe of eight months. The average time from a proposal being submitted to the grant being awarded keeps decreasing throughout Horizon 2020: it is now 192.5 days, as compared to 303 days in the Seventh Research Framework Programme, FP7, which ran from 2007 to 2013.

> Around 54% of the Horizon 2020 participants are **newcomers** (i.e. they had not participated in FP7). Almost half of them are SMEs.

> **The 20% target on the share of funding going to SMEs was surpassed.**

For further monitoring data, the Horizon 2020 interactive Dashboard can be consulted at: <http://europa.eu/!NP86qt>

¹Focussing on calls for proposals with call deadlines in 2016, with the cut-off date of 1st September 2017.



2

OVERVIEW OF CALLS



329

calls for proposals closed



€24.8b

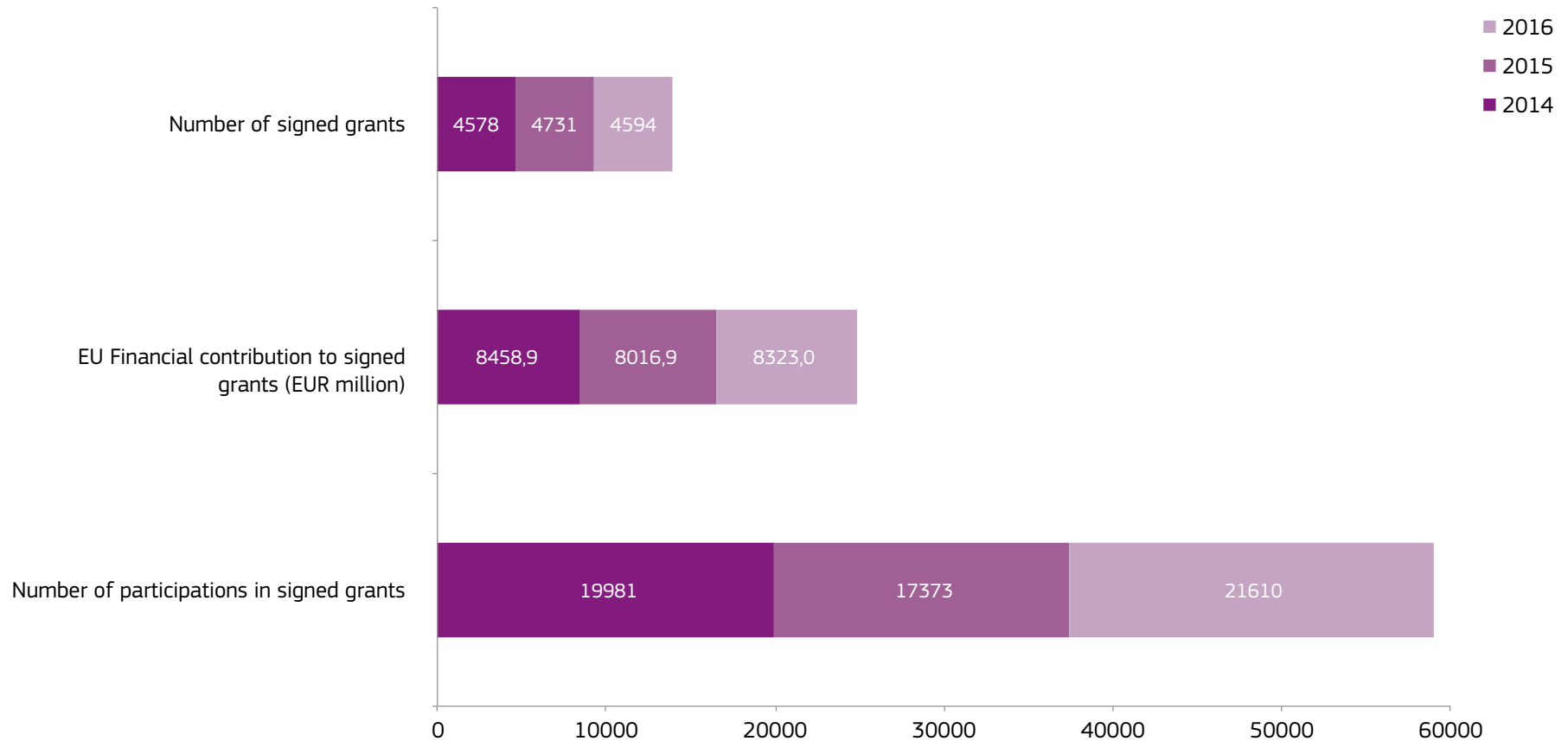
of EU contribution allocated to signed grants



13 903

grants signed over 2014-2016

FIGURE 1: Overall signed grants per year (number, participation and EU contribution)



Source: Corda, calls in first three years, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

Since the start of Horizon 2020 in December 2013, 329 calls for proposals were completed. These resulted in the signature of 13 903 grants which requested a total EU financial contribution of EUR 24.8 billion. These grants assemble a total of 58 964 participations. Looking specifically at calls closed in 2016, some 4 594 grant agreements have been signed (including 21 610 participations) which have a total budget allocation of EUR 8.3 billion.

3

PROPOSALS & APPLICATIONS



115 235

eligible proposals submitted



48.4%

of eligible proposals assessed as high-quality



€66.3b

more would have been needed to fund
all high-quality proposals in the first
three years of Horizon 2020

FIGURE 2: Overview of eligible proposals submitted

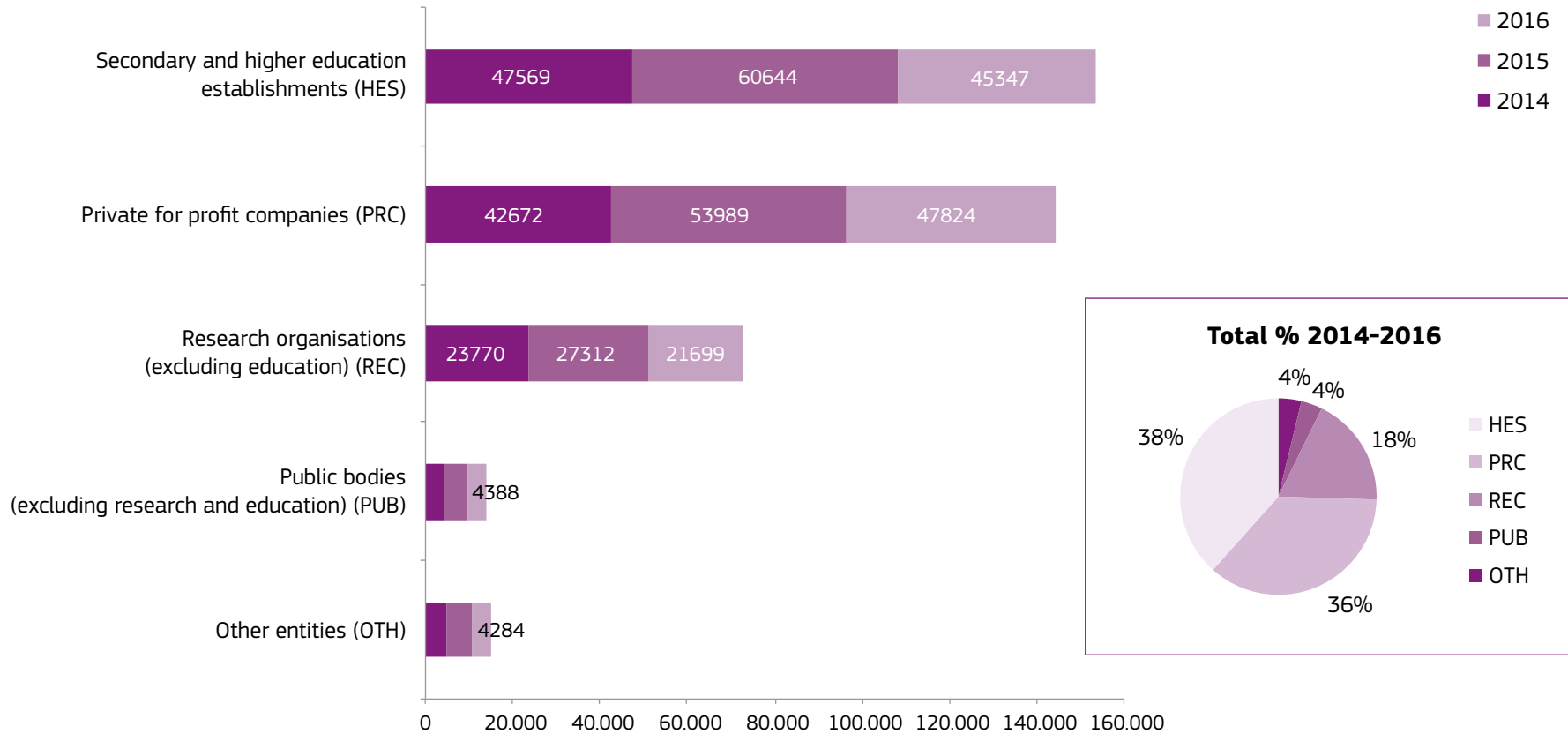


Source: Corda, calls in the first three years, Call deadline cut-off date: 1/01/2017

A total of 115 235 eligible proposals were submitted under Horizon 2020 calls closed in 2014-2016 - representing EUR 182.4 billion of requested EU financial contribution and close to 400 000 applications. Almost half of these proposals have been assessed as high-quality during the evaluation process (48.4) with a significant increase in 2016 only (from 47% in 2015 to 55% in 2016). The share of retained proposals also increased over time. However EUR 66.3 billion more would have been required if all high quality proposals were to be funded during the first three years of Horizon 2020.

For definitions of terms, see the Glossary on page 62

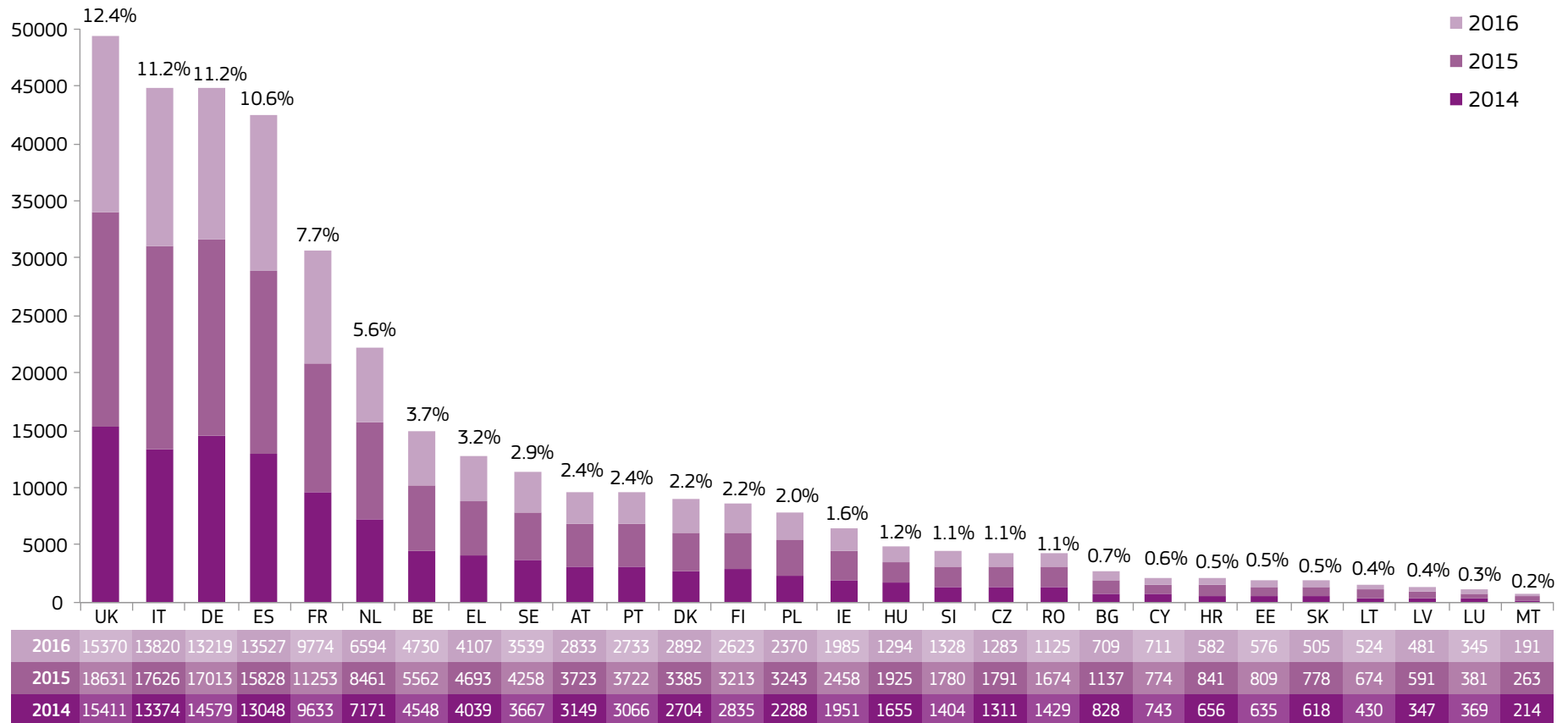
FIGURE 3: Applications in eligible proposals per type of organisation, 2014-2016



Source: Corda, calls in the first three years, Applications in eligible proposals, Cut-off date by 1/09/2017

Looking at the types of organisations submitting proposals to Horizon 2020, the largest share of all applications comes from secondary and higher education establishments (HES) (38.4%), followed by private for-profit companies (PRC) (36.1%), while research organisations (REC) rank third with 18.2% of applications. Fewer applications come from public bodies (PUB) (3.8%) and other entities (OTH) (3.5%). PRC and HES account for almost three quarters of all applications (74%). More than 55 500 distinct companies (and more than 35 000 SMEs), 5 100 HES, 5 300 REC, and 4 000 PUB have so far applied to the programme.

FIGURE 4: Number of Horizon 2020 applications per EU Member State 2014-2016, and share of overall Horizon 2020 applications



Source: Corda, calls in the first three years, Applications in eligible proposals, Cut-off date by 1/09/2017

This chart shows the total number of applications from EU Member States. Since the start of Horizon 2020, six out of ten applications come from United Kingdom, Italy, Germany, Spain and France. The number of applications decreased in all Member States between 2015 and 2016. However, combined with an increase in the EU financial contribution to successful proposals, this resulted in higher success rate in terms of funding.

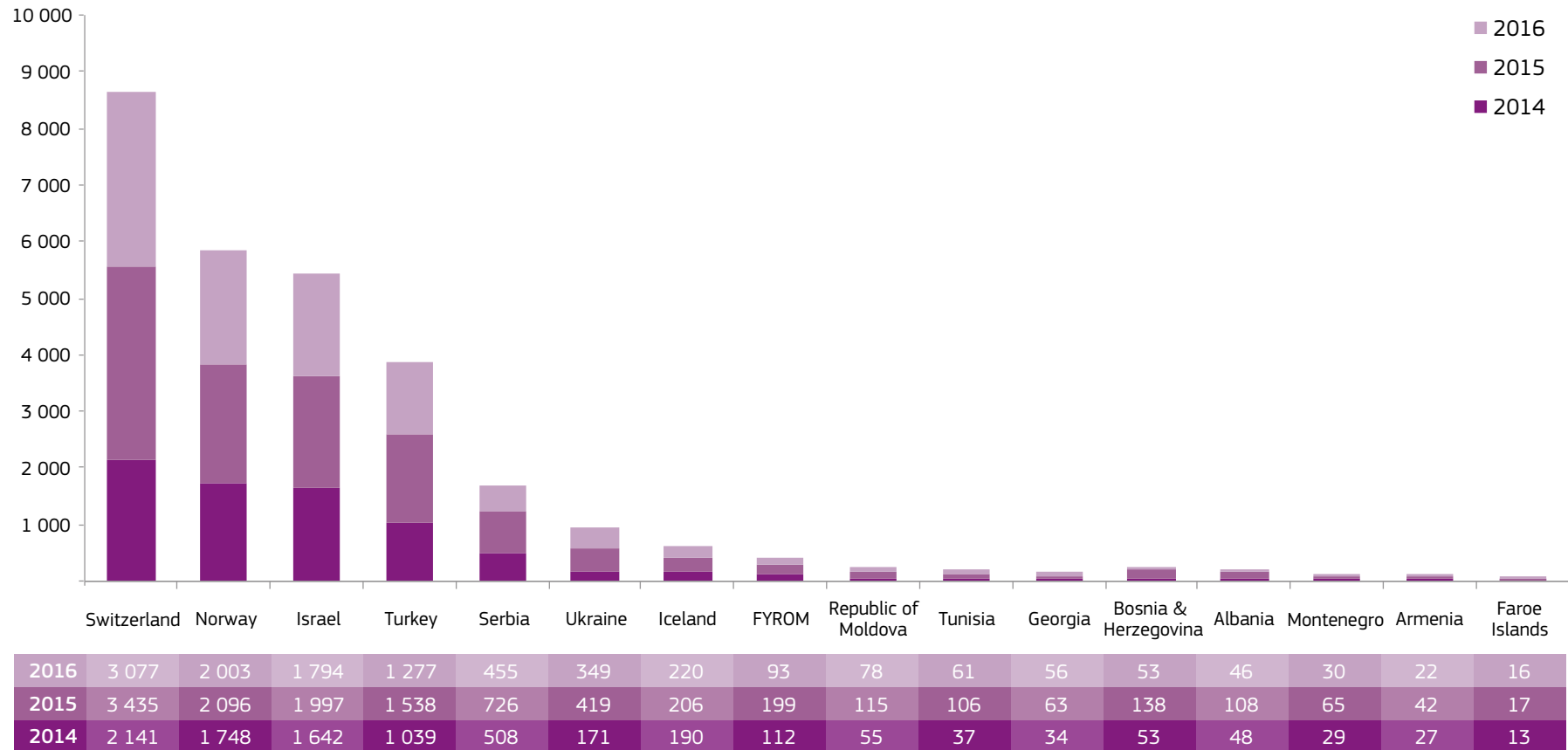
FIGURE 5: Total number of applications to Horizon 2020 2014-2016 per thousand R&D personnel and researchers (2016), per Member State



Source: Corda, calls in the first three years, Applications in eligible proposals, Cut-off date by 1/09/2017, Eurostat data, R&D personnel and researchers (FR: latest data: 2014, PL: latest data: 2015), November 2017

This chart shows the number of applications per Member State per thousand R&D personnel and researchers in the population. On average in the EU28 countries there were 192 applications to Horizon 2020 for thousand R&D personnel and researchers in the first three years of the programme.

FIGURE 6: Number of Horizon 2020 applications per Associated Country, 2014-2016



Source: Corda, calls in the first three years, Applications in eligible proposals, Cut-off date by 1/09/2017

This chart shows the total number of applications from countries associated to Horizon 2020, which represent 7.2% of all applications for the first three years of Horizon 2020 with a total of 28 746 applications involving 6 398 distinct applicants. Most applications from these countries come from Switzerland, followed by Norway, Israel and Turkey.

FIGURE 7: Number of Horizon 2020 applications from the 10 most active Third Countries, 2014-2016



Source: Corda, calls in the first three years, Applications in eligible proposals, Cut-off date by 1/09/2017

The chart shows the top ten most active Third Countries in terms of eligible applications to Horizon 2020. The applications from entities based in Third Countries represent 3.2% of all applications since the launch of Horizon 2020, with a total of 12 780 applications involving 4 471 distinct applicants. The Third Countries that have applied most often to Horizon 2020 - the United States, China, Canada, Australia and South Africa - submitted 53.6% of all eligible applications from Third Countries during the first three years of the programme.



4

SUCCESS RATES



12.6%

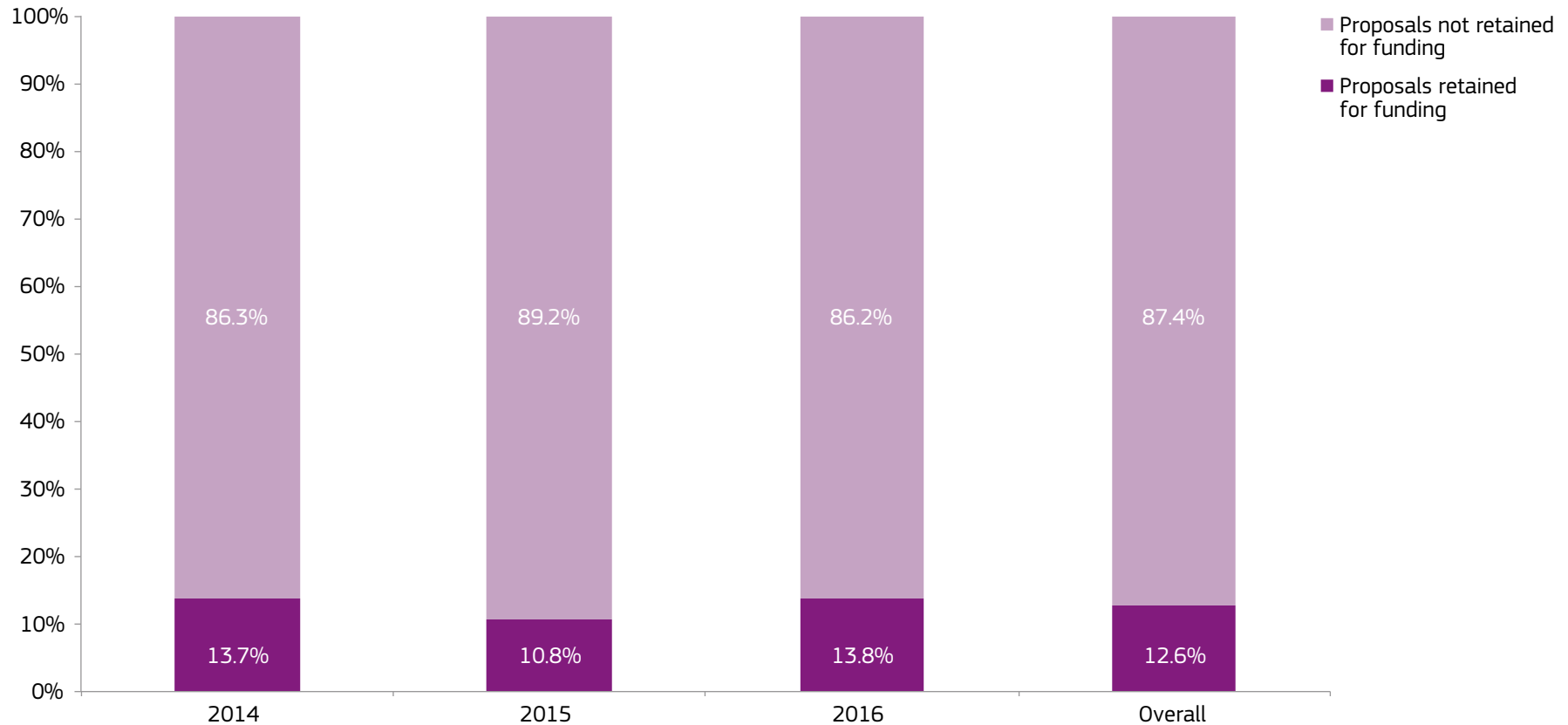
of proposals were retained for funding in the first three years of Horizon 2020



74 %

of high quality proposals in the first three years of Horizon 2020 were not funded

FIGURE 8: Success rates of proposals, 2014-2016

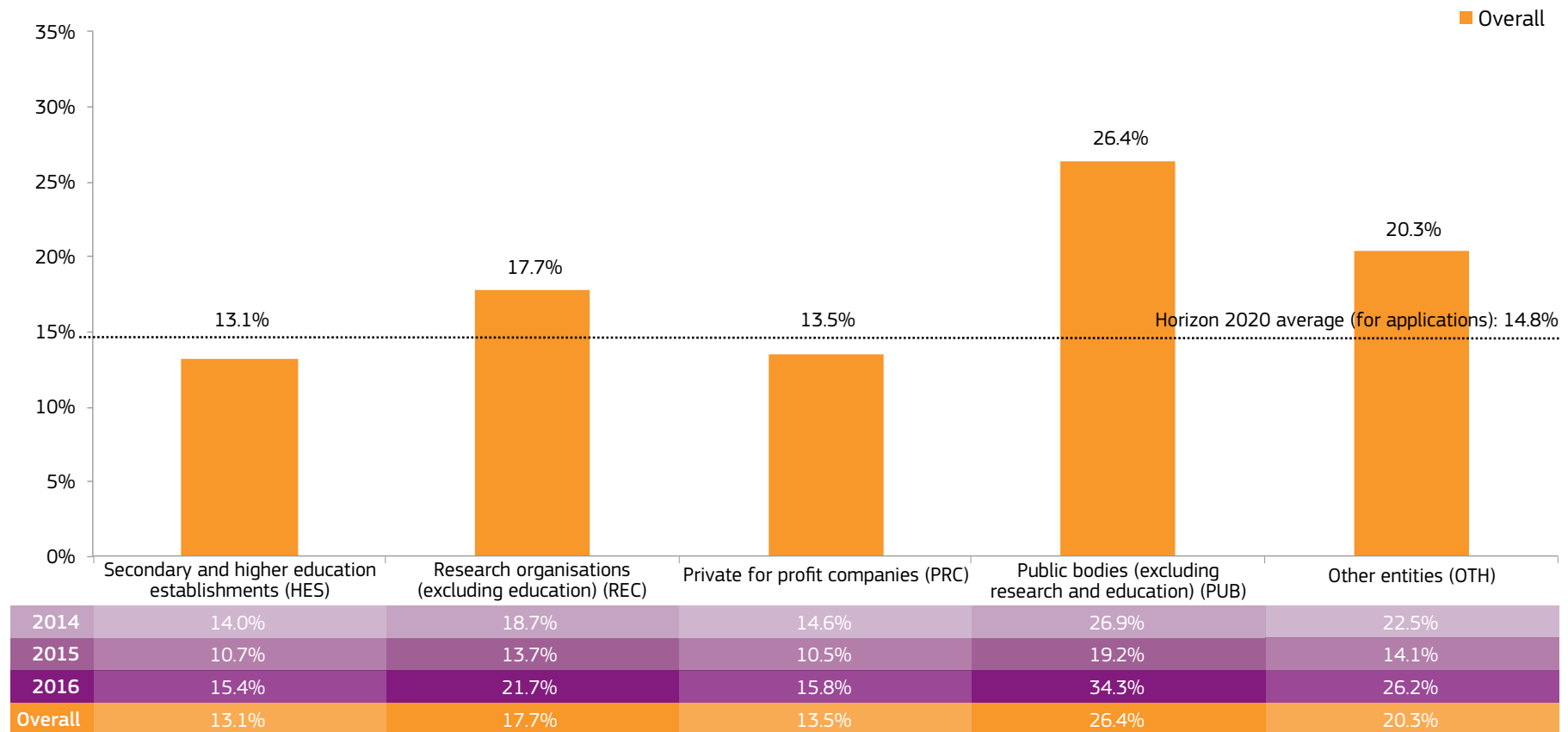


Source: Corda, calls in the first three years, Cut-off date by 1/09/2017 (excluding grants to named beneficiaries)

This chart shows the overall success rate of proposals submitted to Horizon 2020 over the first three years². After a decline in the success rate in 2015 due to a high number of applications compared to the funding available, the success rates increased in 2016 with 13.8% of proposals being retained for funding. Overall, since the start of Horizon 2020, the success rate is of 12.6%. This equates to one out of eight eligible proposals receiving funding, but 74% of high quality proposals not being funded. This is well below the overall success rate of FP7 (18.4%).

² Success rates are calculated excluding ad hoc calls to named beneficiaries and outline proposals in the first stage of two-stage calls.

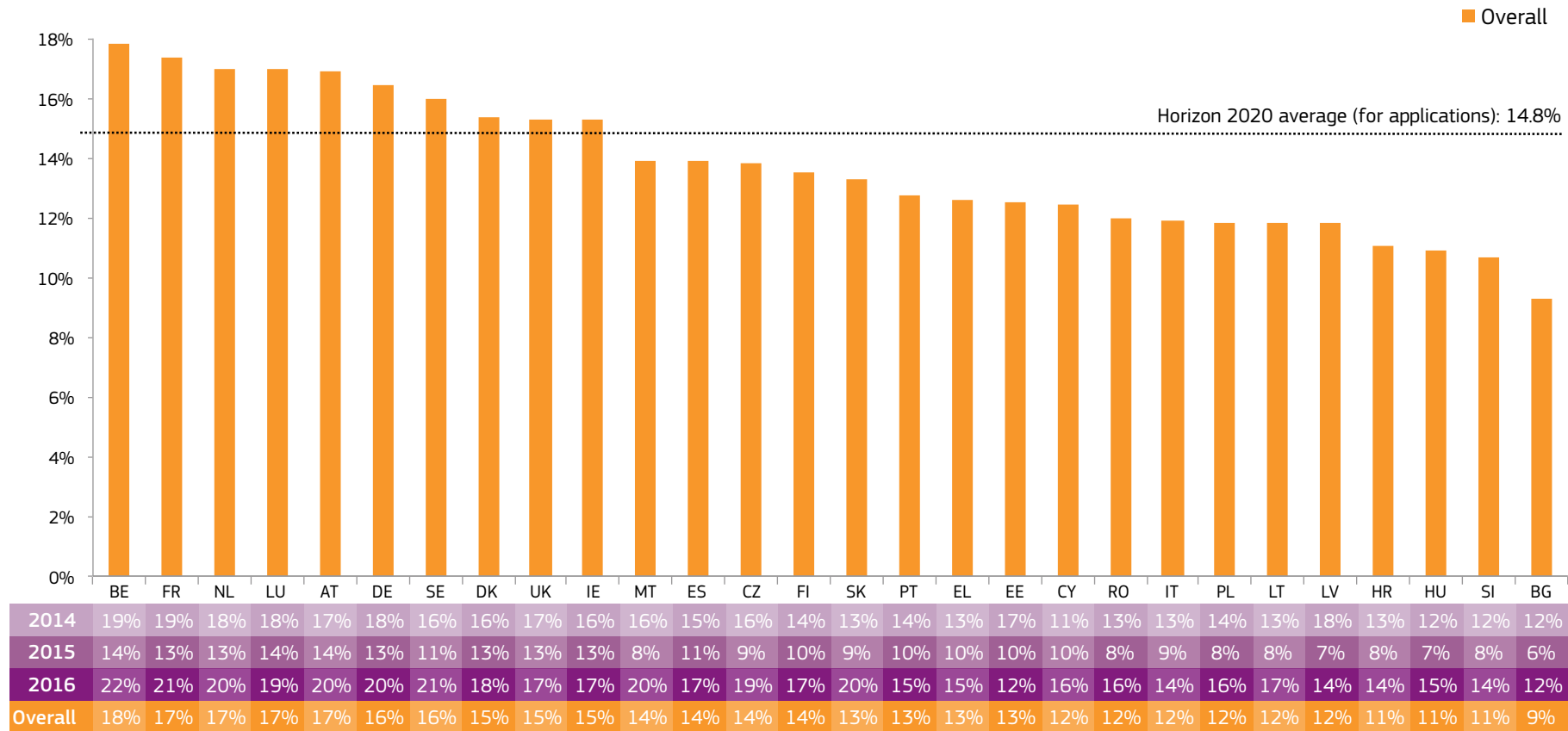
FIGURE 9: Success rates of Horizon 2020 applications per type of organisation, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (excluding grants to named beneficiaries)

This chart shows the success rate across different types of organisations. Since Horizon 2020 started, 34% of all applications came from secondary and higher education institutions, 33% from the private sector and 22% from research organisations. Although public bodies have the second lowest application rate (4%), they have the highest success rate (26.4%), followed by the ‘Other entities’ category (20.3%), research organisations (17.7%), private-for-profit companies (13.5%) and secondary and higher education institutions (13.1%).

FIGURE 10: Success rates of Horizon 2020 applications per Member State, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (excluding grants to named beneficiaries)

This chart shows the overall application success rate per Member State. After a strong drop in success rates of applications by entities from all Member States in 2015 associated to a high number of applications, the success rates increased again in 2016 for all Member States. Applications from entities in Belgium, France, the Netherlands, Luxembourg and Austria are the most successful, with more than one out of six applications being successful, while applications from entities in Bulgaria, Slovenia, Hungary, Croatia and Latvia are less successful.

5

SIGNED GRANTS & PARTICIPATIONS



11 768

private for-profit companies
participate in Horizon 2020



2 147

research organisations participate
in Horizon 2020



1 494

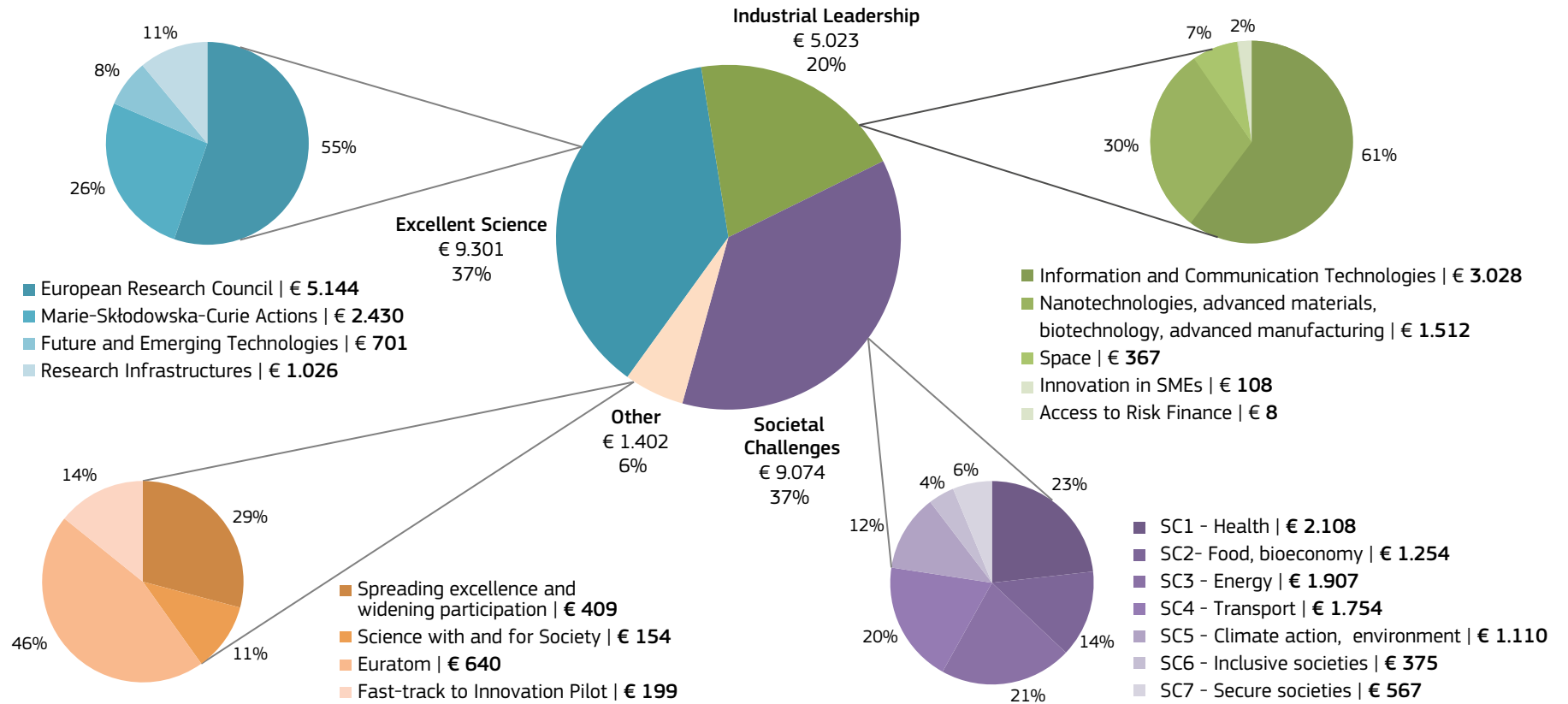
secondary and higher education institutions
participate in Horizon 2020



1 490

public bodies participate
in Horizon 2020

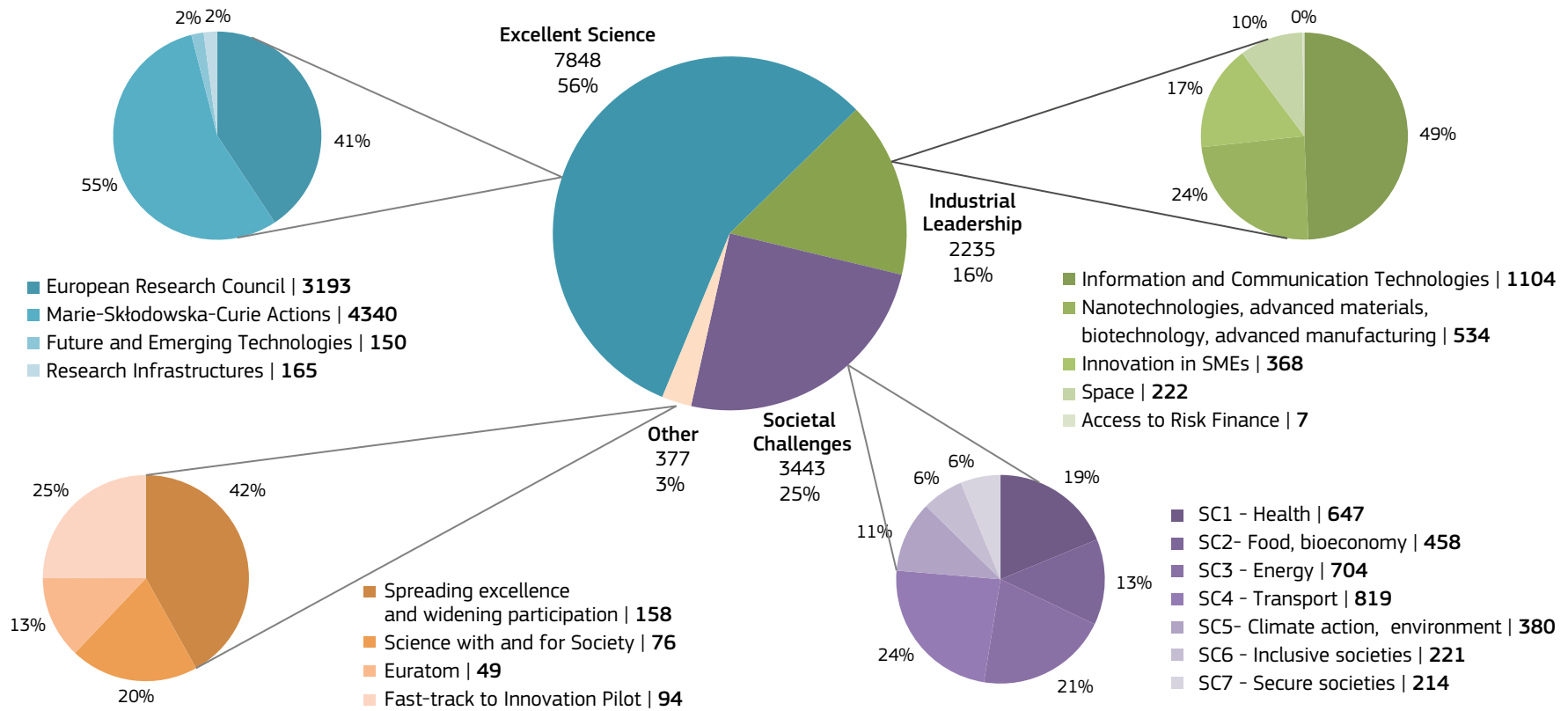
FIGURE 11: EU contribution to signed grants per programme part (EUR million), 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

Since the start of Horizon 2020, a total EU financial contribution of EUR 24.8 billion has been allocated to signed grants. Overall the largest share of funding has been allocated to the Excellent Science pillar (37.5%), mainly to the European Research Council. The Societal Challenges pillar accounts for 36.6% of the funding, with most funding going to Societal Challenge 1 on Health, Demographic Change and Wellbeing. The Industrial Leadership pillar was allocated 20.2% of the funding, mainly for information and communication technologies.

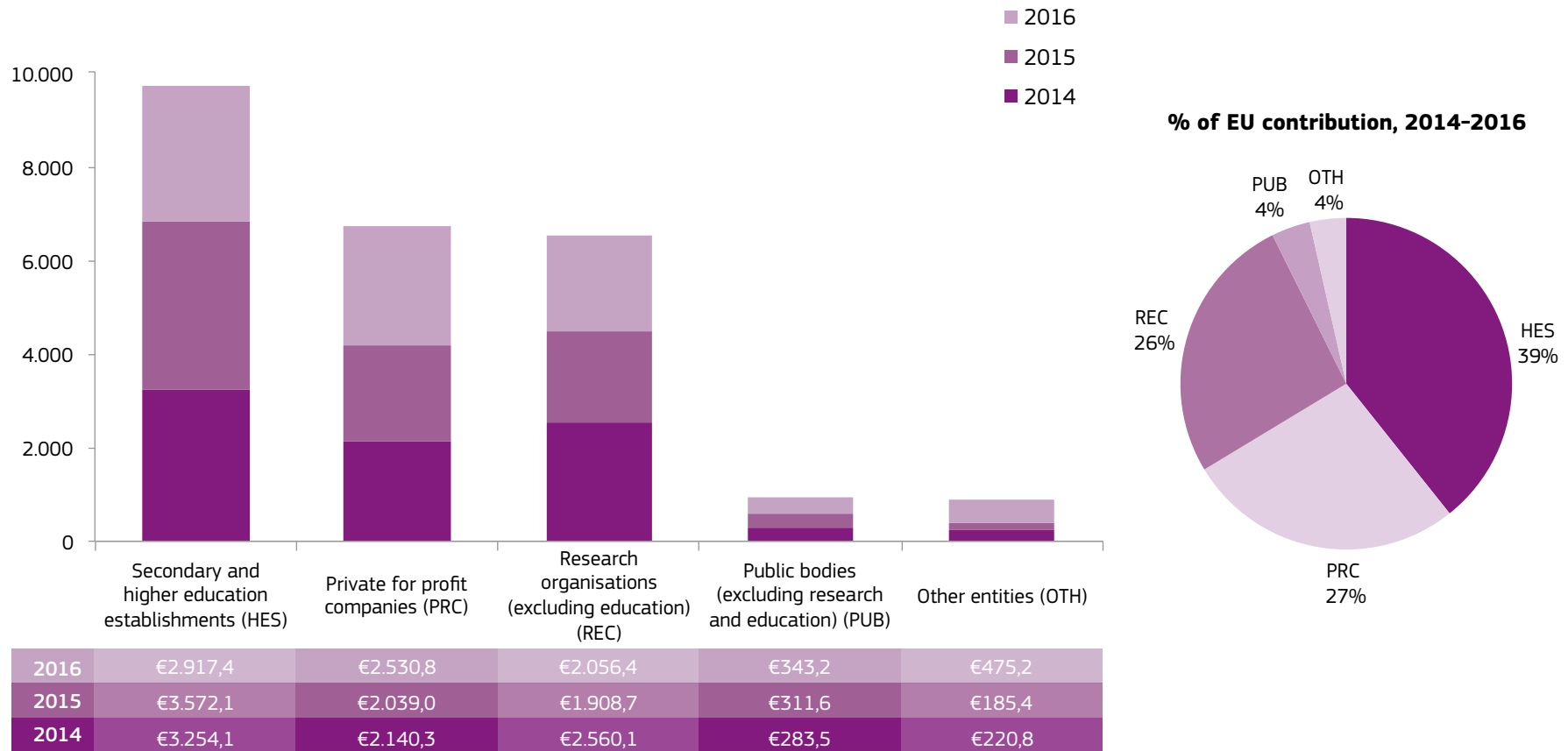
FIGURE 12: Number of signed grants per programme part, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

Out of the 13 903 grants signed since the start of Horizon 2020, a majority (56.4%) fall under the Excellent Science pillar, mainly under the Marie Skłodowska-Curie Actions. The Societal Challenges pillar accounts for 24.8% of the signed grants, with most grants being signed under Societal Challenge 4 which covers Smart, Green and Integrated Transport. The Industrial Leadership pillar represents 16.0% of the signed grants, with most grants being signed under the Information and Communication Technologies programme part.

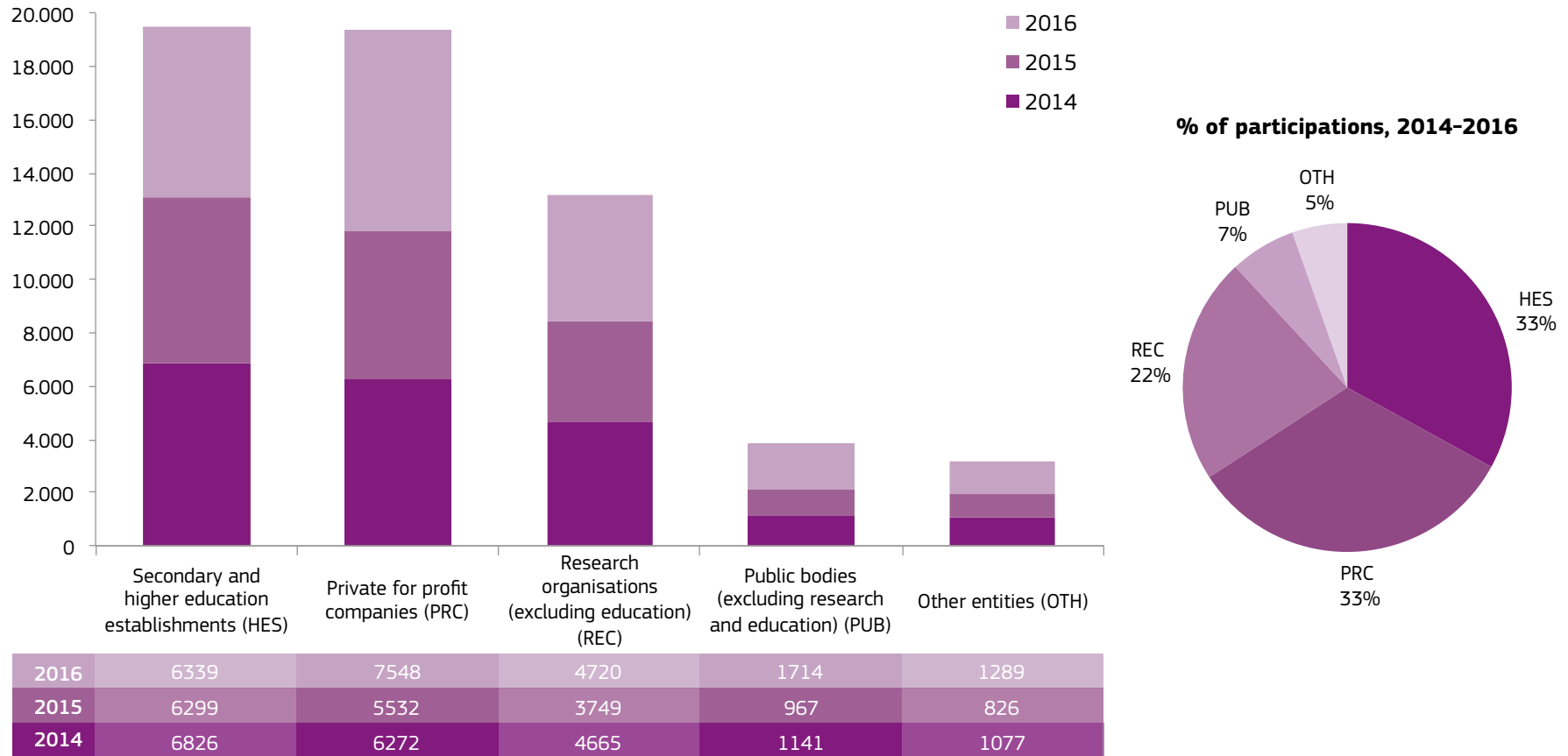
FIGURE 13: EU contribution (EUR million) to signed grants per type of organisation, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

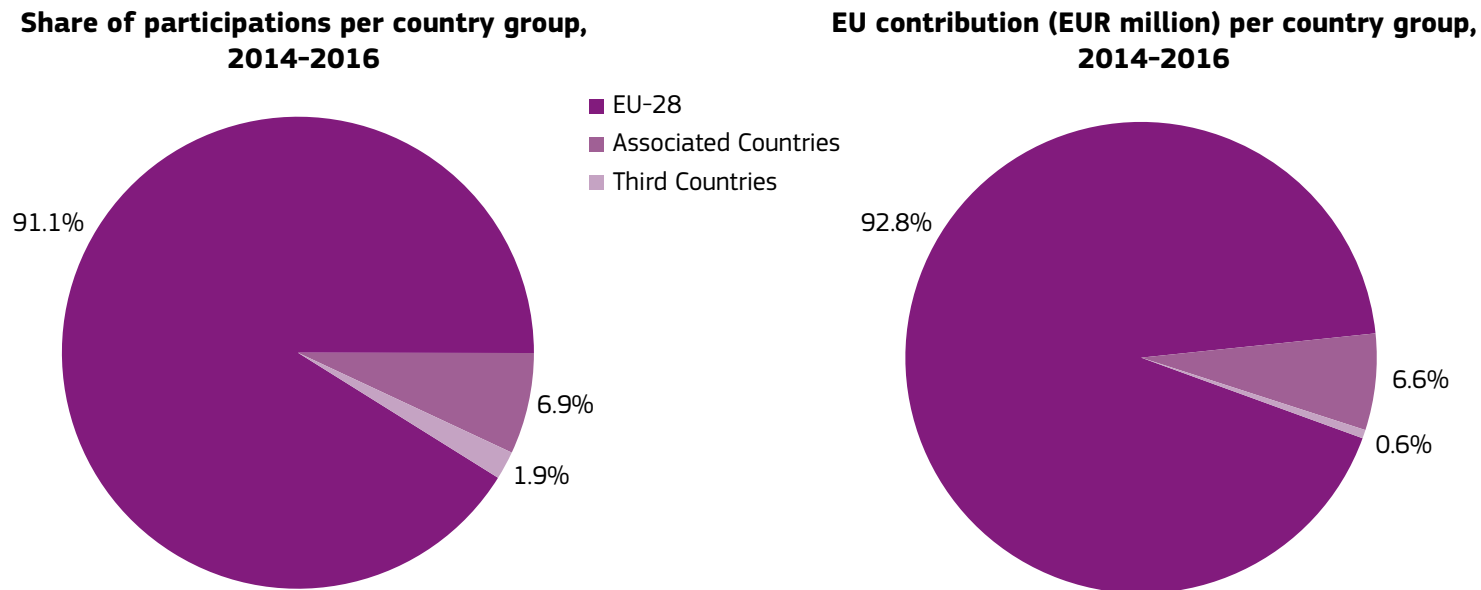
Looking at the type of participating organisations since the start of Horizon 2020, secondary and higher education institutions remain in first place in terms of EU contribution received (EUR 9.7 billion, 39%), despite the increasing number of participations from the private sector. The overall EU contribution to private for-profit companies amounts to EUR 6.7 billion (27%), whereas research organisations were allocated 8.3% of the funding with EUR 6.5 billion since Horizon 2020 started.

FIGURE 14: Number of participations to signed grants per type of organisation, 2014-2016



Secondary and higher education institutions and private for-profit companies represent two thirds of participations in Horizon 2020, with close to 20 000 participations for each category against 13 134 for research organisations (22.3%), 3 822 for public bodies (6.5%) and 3 192 for other entities (5.4%). Overall more than 7 900 SMEs participate in Horizon 2020.

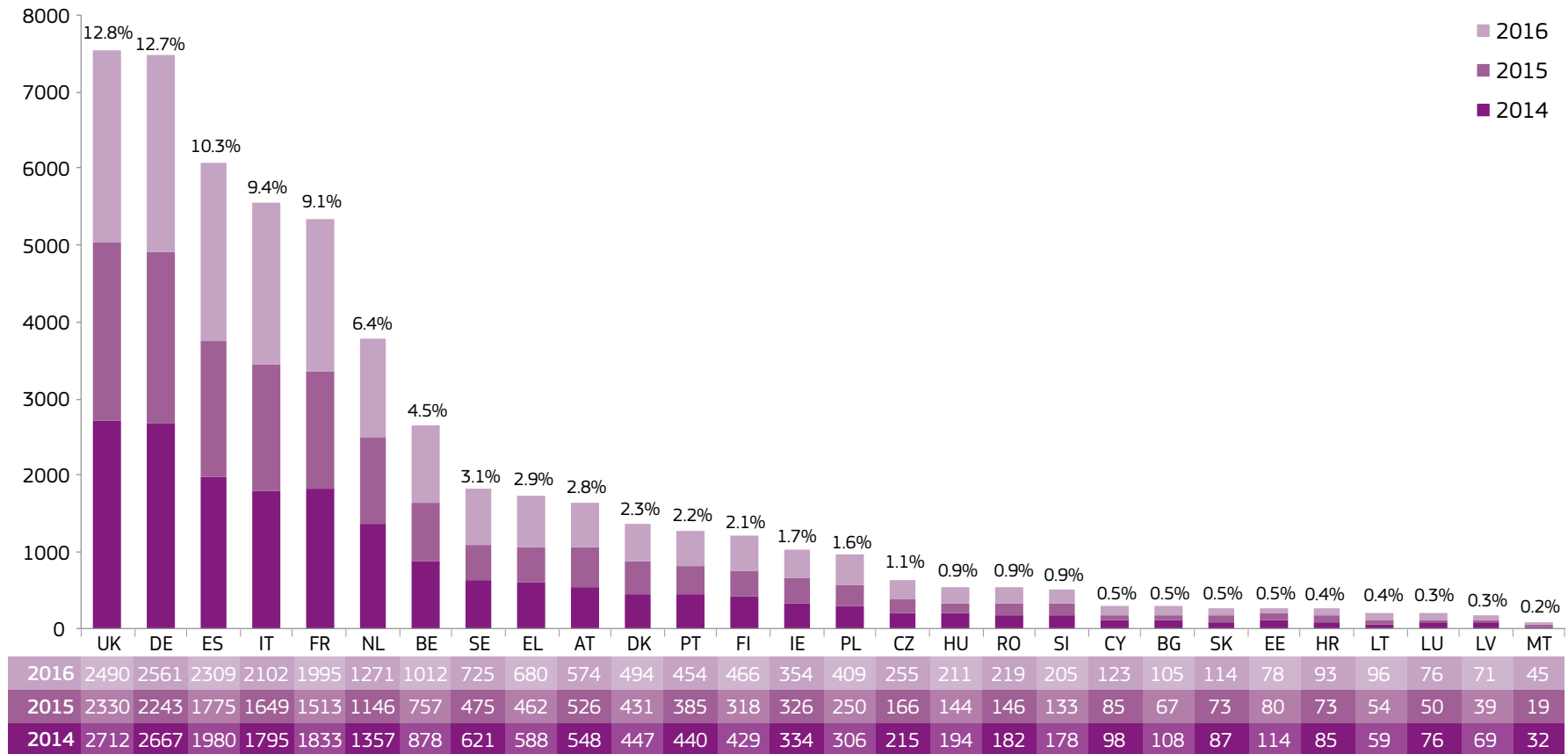
FIGURE 15: Share of Horizon 2020 participations and EU contribution in signed grants per country group



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

This chart provides an overview of the distribution of the 58 964 participations and EUR 24.8 billion of EU contribution per country groups. Since the start of Horizon 2020, entities from Member States receive a total of 92.8% of the EU contribution while representing 91.1% of participations. Associated countries represent 6.9% of the participations and 6.6% of the funding allocated (9.0% in FP7), whereas Third Countries constitute 1.9% of participations for 0.6% of the funding (1.3% in FP7).

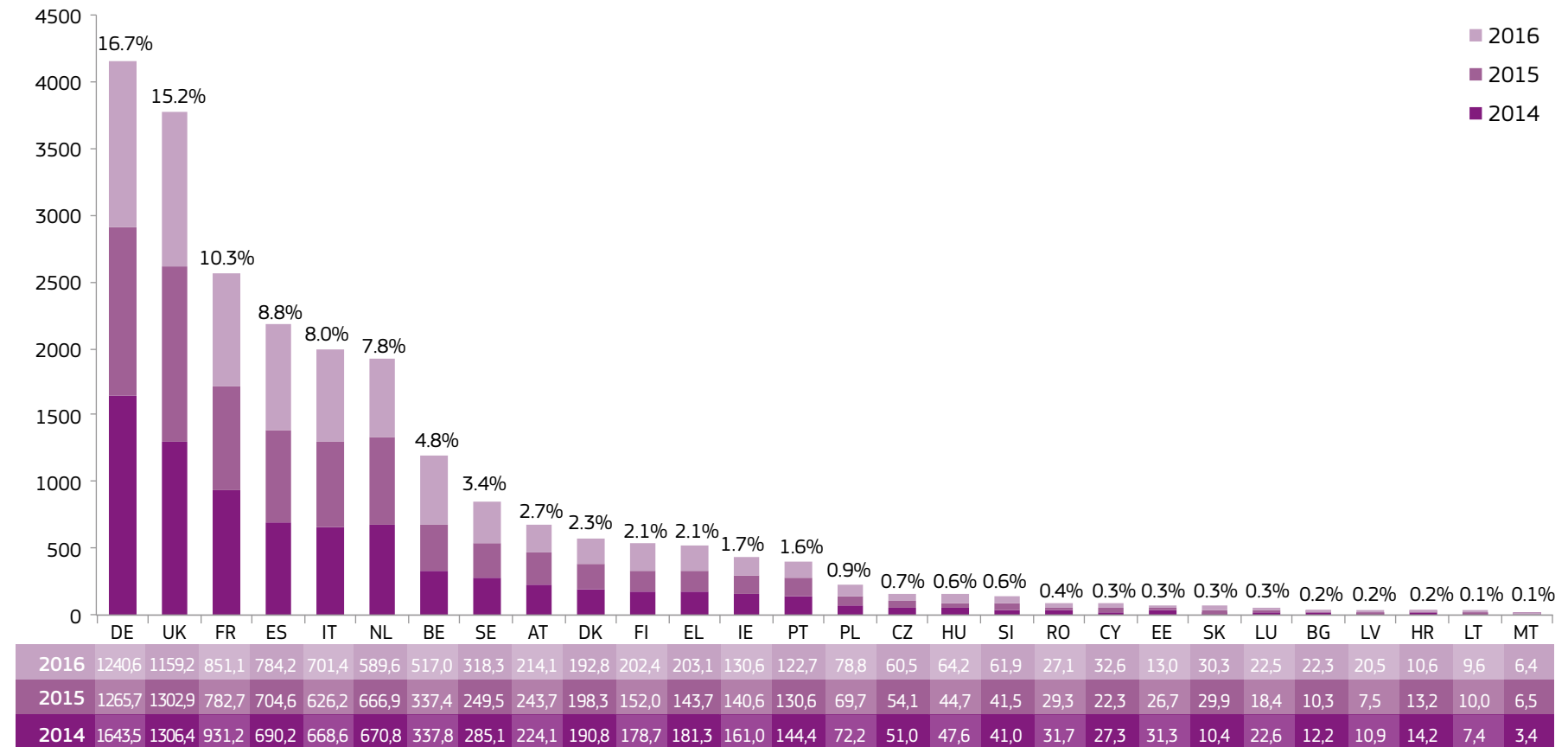
FIGURE 16: Number of participations to Horizon 2020 per Member State, 2014-2016, and share of total Horizon 2020 participations



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

The chart shows the share of participations in signed grant agreements across EU Member States. The United Kingdom has the highest share of participations in signed grant agreements (12.8% of total Horizon 2020 participations), followed by Germany (12.7%) and Spain (10.3%).

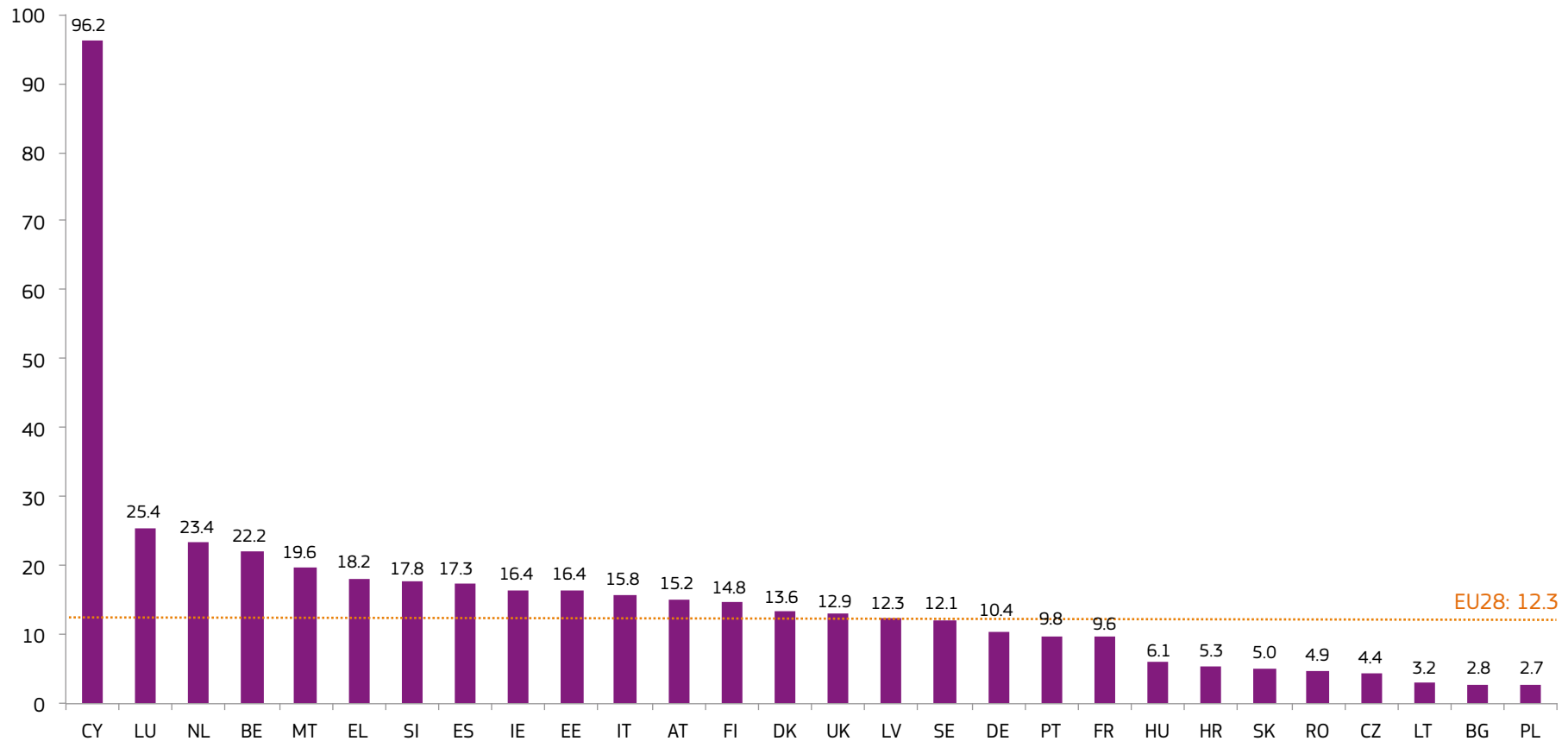
FIGURE 17: EU contribution (EUR million) per Member State of participants, 2014-2016, and share of total Horizon 2020 EU contribution



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

This chart shows the level of EU contribution going to participants from each EU Member State. In absolute terms Germany comes first, followed by the United Kingdom, France and Spain.

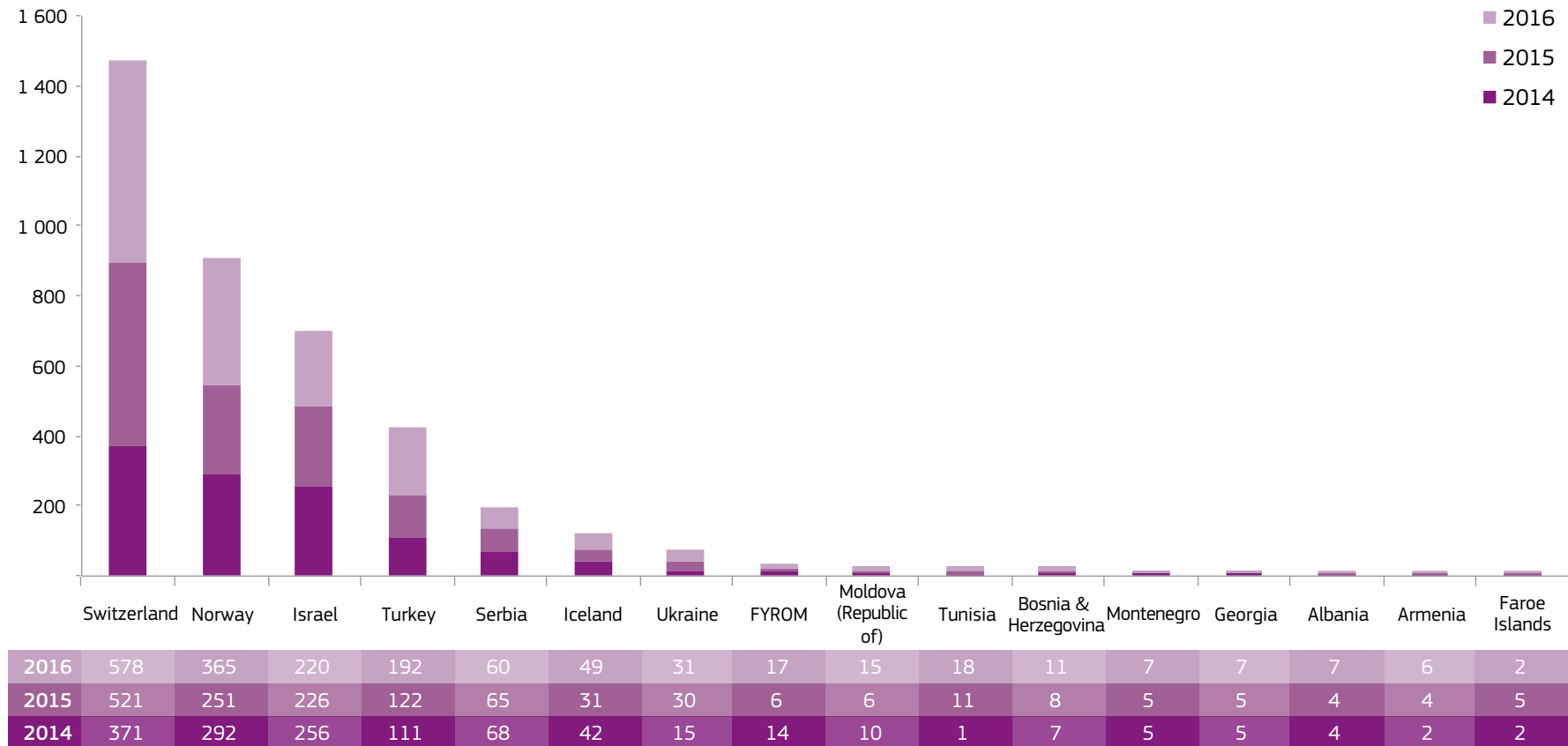
FIGURE 18: EU contribution per thousand R&D personnel and researchers (EUR million), per Member State, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries), Eurostat data, R&D personnel and researchers (FR: latest data: 2014, PL: latest data: 2015), November 2017

This chart shows the Horizon 2020 EU contribution per thousand R&D personnel and researchers in the population of the Member States. Relative to the size of their researchers population, Cyprus comes first in terms of EU contribution received through Horizon 2020 in the first three years of the programme, followed by Luxembourg, the Netherlands and Belgium.

FIGURE 19: Number of participations in Horizon 2020 per Associated Country, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

The vast majority of the 16 countries associated to Horizon 2020 have increased their number of participations over the period 2015-2016. Since the start of the programme, a total of 4 090 participations come from Associated Countries (6.9% of total participations) of which 75.3% come from Switzerland, Norway and Israel alone.

FIGURE 20: Number of Horizon 2020 participations for the 10 most active Third Countries, 2014-2016



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

Third Countries represent 1.9% of participations since the start of Horizon 2020, with participants from 95 different Third Countries participating in the programme. This chart shows the share of participations from the top ten most active third countries, with the United States and China gathering four out of ten of these participations, followed by South Africa, Canada and Brazil.



6

NEWCOMERS



54.4%

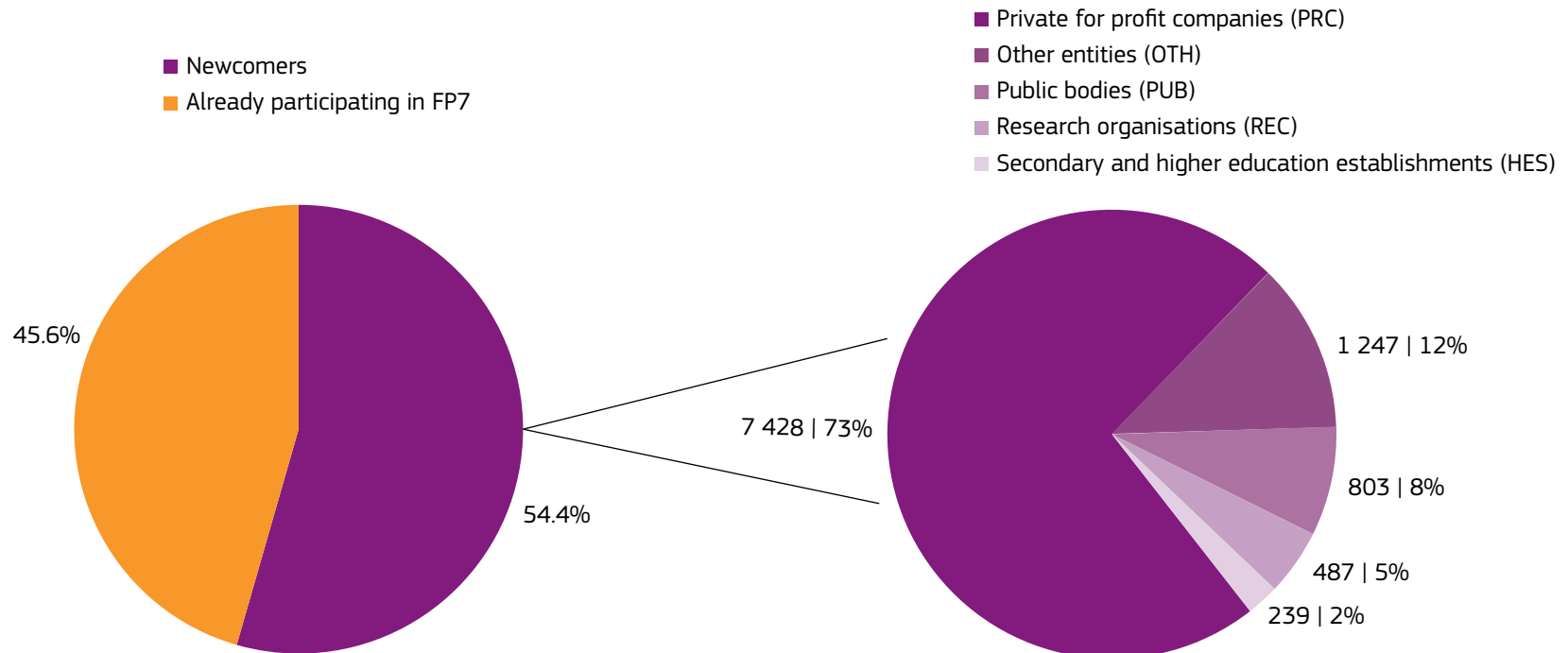
of Horizon 2020 participants
are newcomers to
the Framework Programme



48.9%

of newcomers are SMEs

FIGURE 21: Share of newcomers to Horizon 2020 compared to FP7 and distribution per type of organisation



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017 (including grants to named beneficiaries)

A newcomer is defined as a successful applicant to Horizon 2020 who did not apply to FP7. The chart shows that 54.4% of unique participants across the first three years did not participate in FP7, whereas 45.6% did. The share of newcomers is expected to increase throughout the programme duration. This represents a total of 10 204 newcomers.

In the first three years of Horizon 2020, 73% of the newcomers were private for profit companies. More specifically, 48.9% of newcomers are SMEs.

7

SME INSTRUMENT



€859.9m

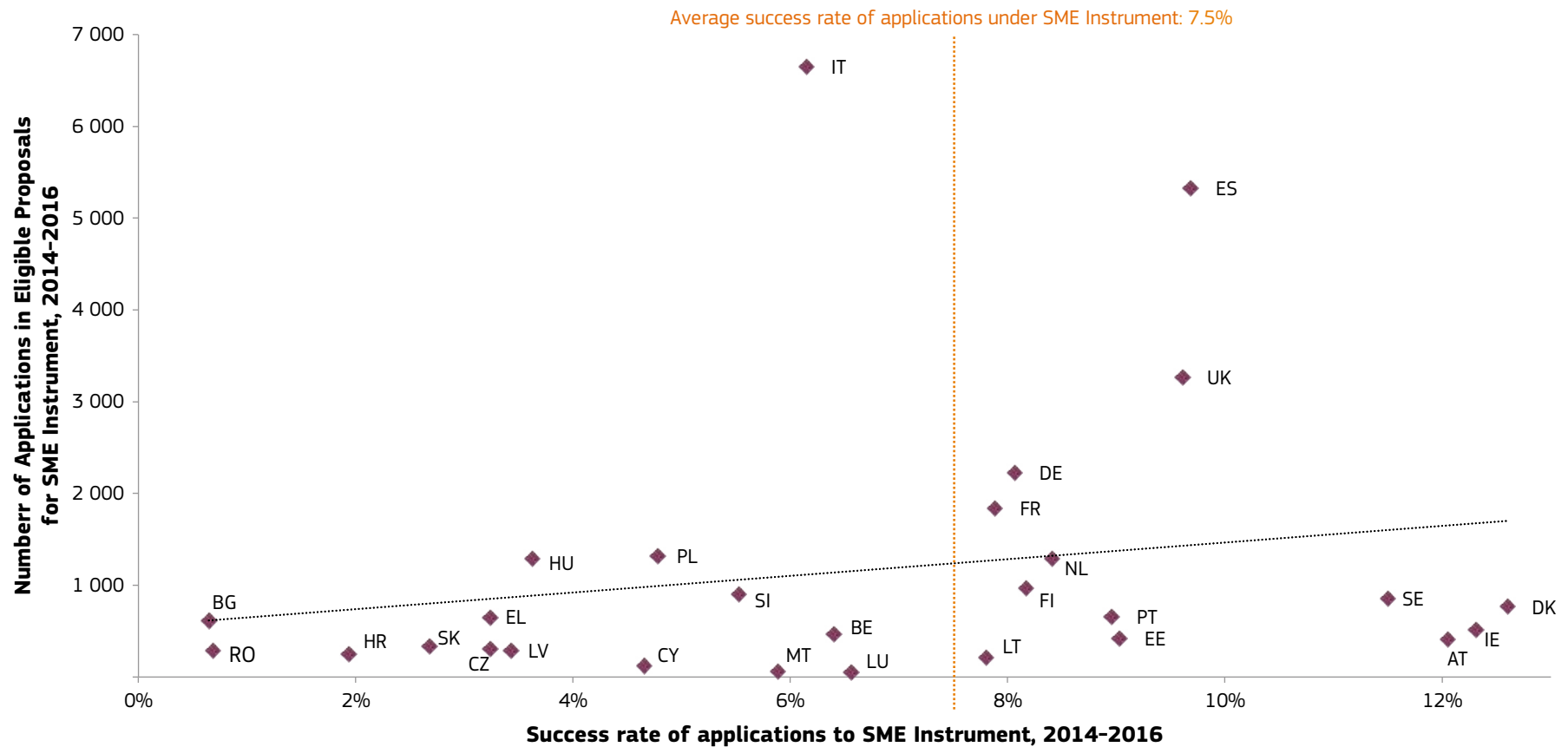
of EU contribution allocated
through the SME Instrument



2 319

grants signed under
the SME Instrument

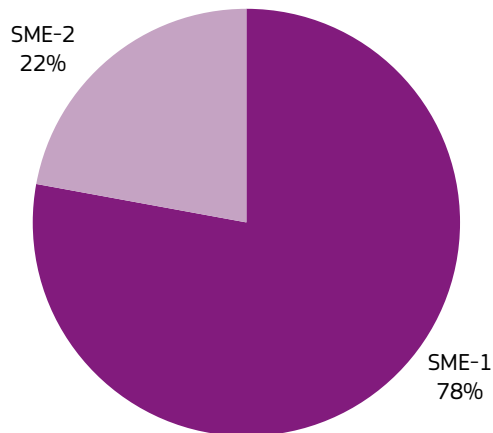
FIGURE 22: Number of applications to the SME Instrument and success rate per Member State, 2014-2016



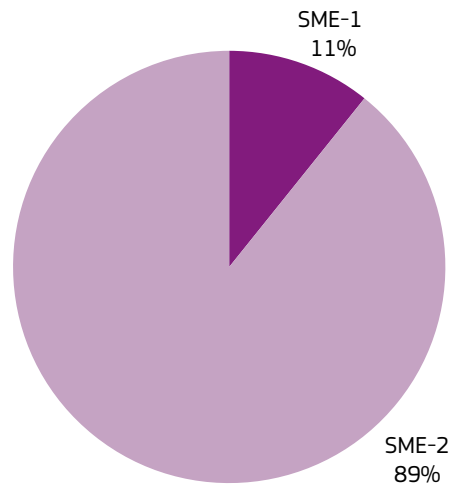
Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017

This chart shows the number of applications per Member State and the success rate of the applications, showing a low level of correlation. Countries like Denmark, Ireland, Austria and Sweden have high success rates and a low number of applications, whereas Spain and the United Kingdom have both a high number of applications and above average success rates.

Share of participations, SME-1 and SME-2



EU contribution, SME-1 and SME-2



SME INSTRUMENT PHASES

- > **Phase 1:** Feasibility assessment:
lump sum of €50,000;
Duration of ~ 6 months
- > **Phase 2:** Innovation project:
underpinned by business plan
(potentially supported under Phase 1);
€ 500,000 – € 2.5 million or more
(covering up to 70% of eligible costs),
Duration of 1-2 year

A total of 34 960 applications in eligible proposals were made to the SME Instrument since the start of Horizon 2020, with an increase from year to year and with an average success rate of applications of 7.5%. The overall EU contribution allocated through the SME Instrument represents EUR 859.9 million to 2 319 grants. More than three quarters of grants were signed under Phase 1 of the SME Instrument, whereas grants under Phase 2 represent 89% of the EU contribution allocated under the SME Instrument.



8

TIME-TO-GRANT



111

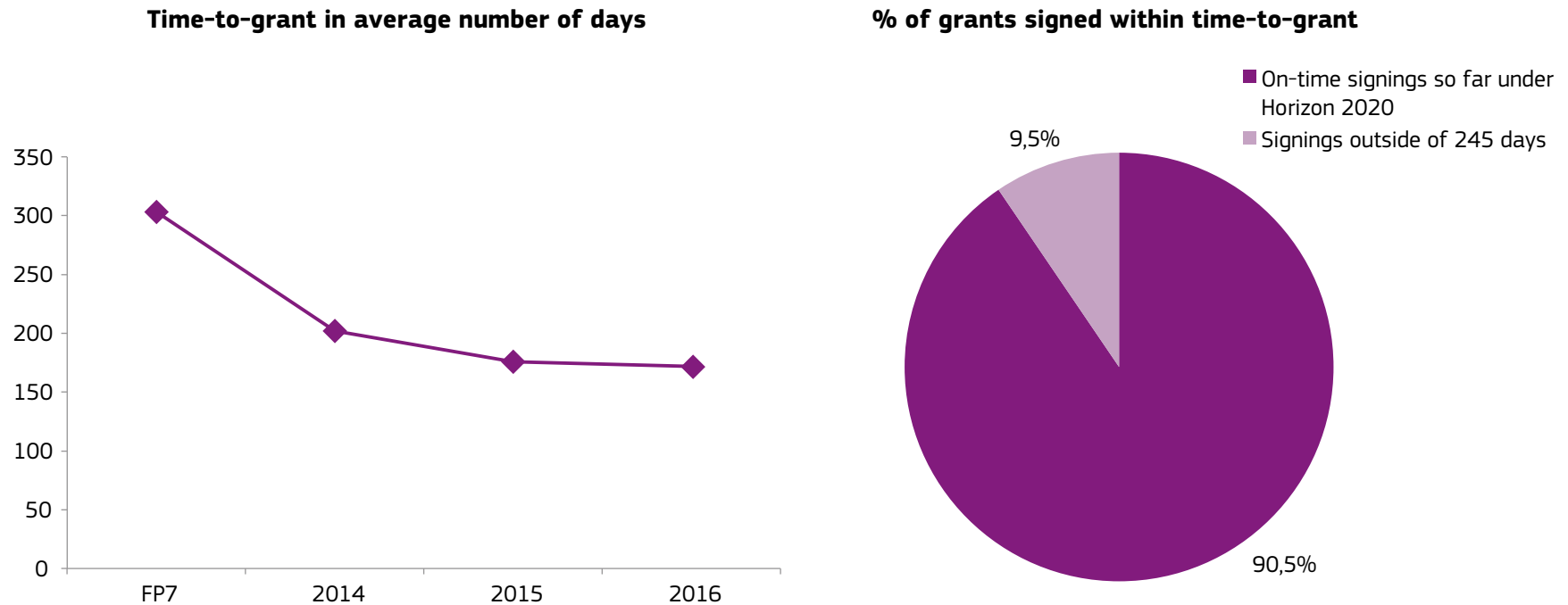
days faster time-to-grant
than under FP7



90.5%

of grants signed within
target timeframe (8 months)

FIGURE 23: Time-to-grant in average number of days and share of grants signed within time to grant



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017

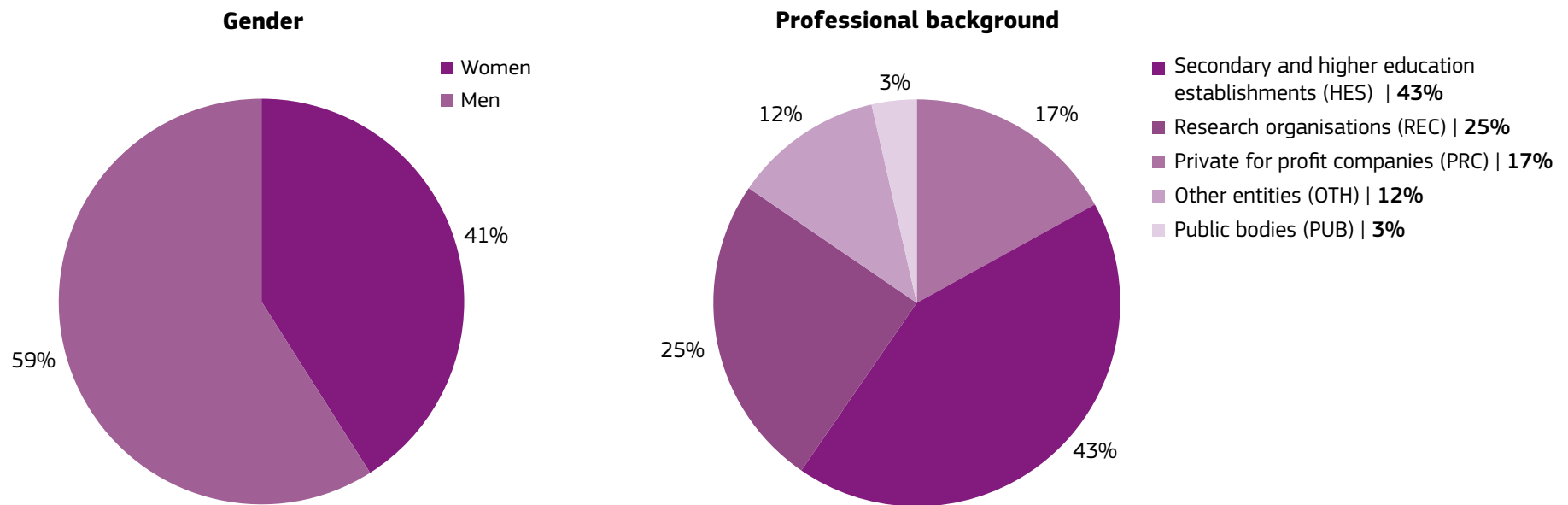
‘Time-to-grant’ is the elapsed time between the call closing date and the signing of the grant agreement, which marks the official start of the project. Under Horizon 2020, the European Commission has committed to signing grant agreements within 245 days (eight months) for all calls other than those of the European Research Council. Compared to FP7 which recorded an average time-to-grant of 303 days, grant agreements are signed more than 110 days faster under Horizon 2020, with an average of 192 days since the programme started. This target has been met in most cases, with 90.5% of grant agreements signed within the target timeframe so far.

9

EVALUATIONS OF PROPOSALS



FIGURE 24: Proposals evaluators – gender and professional background



Source: Corda, calls in 2014, 2015 and 2016, Signed Grants cut-off date by 1/09/2017

These charts show key characteristics of the close to 20,000 external experts evaluating proposals submitted to Horizon 2020. Women represent 41% of experts contracted for proposal evaluation panels. The majority of these experts are affiliated with a secondary or higher education establishment or a research organisation, whereas 17% come from private-for-profit companies, and 15% from public bodies and other entities.

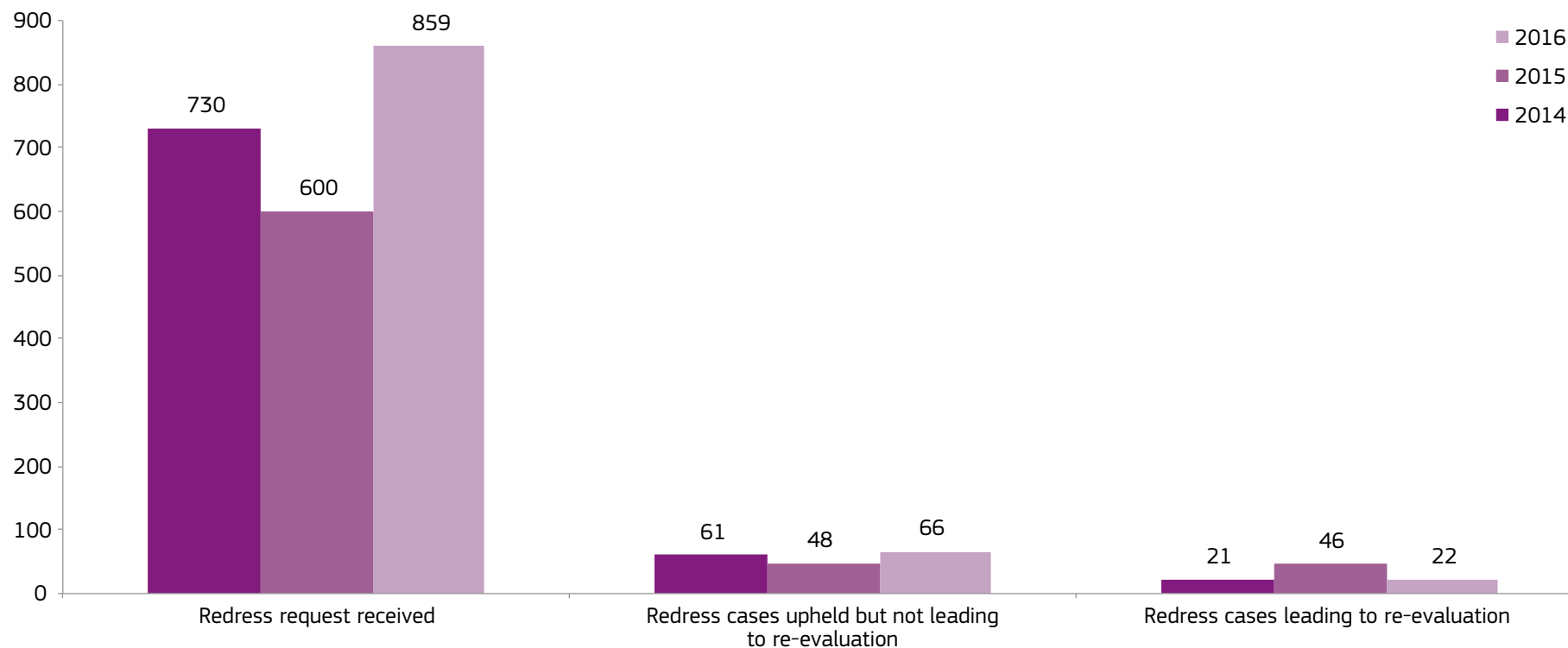
A survey of a sample of 12,000 experts (response rate of 30%) who participated in the evaluation of proposals indicates an improvement in the quality of the proposal evaluation process and the procedures applied. Evaluators were satisfied with the way in which evaluations were conducted with respect to impartiality, confidentiality and fairness. In particular, the level of quality of the evaluation task has been rated as ‘excellent’, ‘good’ or ‘satisfactory’ by over 97% of respondents (‘excellent’ by 32% of respondents in 2016 against 30% in 2015).

10

REDRESS & ETHICS



FIGURE 25: Redress procedures 2014-2016



Source: Commission Services, 21 September 2017. These figures for redress cases related to ERC. This was not the case in previous monitoring exercises.

The Commission provides an evaluation review procedure for applicants to ensure the transparency and equal treatment that underpin all Commission evaluations. Since the start of Horizon 2020, a total of 99 redress cases have led to a re-evaluation, representing less than 0.1% of all proposals submitted.

Ethics is also a high priority in Horizon 2020. In 2016, Ethics Assessments were carried out on 72 proposals. Nearly all proposals were ‘cleared’ or ‘conditionally cleared’ (meaning that some ethics requirements have been added in the Grant Agreement). Only 1 proposal (on a reserve list) was rejected because it did not receive ethics clearance. 7 proposals were flagged for a Second Ethics Assessment and 17 for an Ethics Check which will be carried out during the lifetime of the project, unless a Second Check is no longer justified because of the completion of the requirements. In addition 170 ongoing projects went through an Ethics Check/Follow-up, 163 through a first Ethics Check/Follow-up, 6 through a Second Ethics Check/Follow-up (on-site audit of one FP7 project included) and 1 project through a Third Ethics Follow-up.

11

FIRST PROJECT RESULTS





11 894 publications in peer-reviewed journals, amounting to **52.5%** of all publications
9615 open access articles published in peer-reviewed journals



8414 prototypes, **5534** testing activities, **695** clinical trials
408 patent applications, **21** design, **66** trademarks and **3** utility models applications
141 patents awarded, **19** design, **50** trademarks and **2** utility models awarded



664 projects with new **innovative products**, **329** projects with new **innovative processes**,
321 projects with new **innovative methods**

15.5% of participating firms introducing **innovations new to the market** (covering the period of the project plus three years)

13.9% of participating firms introducing **innovations new to the company** (covering the period of the project plus three years)

Preliminary data on Horizon 2020 project outputs are collected through the continuous project reporting undertaken by beneficiaries under their own responsibility.

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CROSS-CUTTING ISSUES



SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

From the total EU financial contribution allocated through Horizon 2020:



65% is sustainability related (target: 60%), with **EUR 15.7 billion**

28% is climate related (target: 35%), representing **EUR 6.6 billion**

GENDER EQUALITY

Since the start of Horizon 2020, women represent:



55.2% of members of Horizon 2020 **Advisory Groups** (target: 50%)

31.6% of registered experts³ in the Horizon 2020 expert database

41.0% of contracts signed with **experts participating in proposals' evaluation panels** (target: 40% of the under-represented sex)

38.9% of **staff in projects** (self-reported, including non-researchers)

35.1% of Horizon 2020 **project coordinators** (based on proposals)

³ Who declared their gender in the Experts Portal.

SME PARTICIPATION



23.6% of EU contribution allocated to **SMEs** under signed grants in LEIT and Societal Challenges (target: 20%)

6.2% of EU contribution allocated to signed grants from **SME Instrument** in LEIT and Societal Challenges (target: 7%)

OPEN ACCESS



60.8% to 68.7% of Horizon 2020 peer-reviewed publications provided in **open access**⁴

67.8% of the projects covered by the scope of the Open Data pilot make **scientific data accessible & re-usable**. A further 8.9% of projects participate on a voluntary (opt-in) basis.

⁴ From 60,8% of Horizon 2020 peer-reviewed publications in open access. (OpenAIRE sample based mostly on external sources) to 68,7% (CORDA sample based on internal sources)

SOCIAL SCIENCES AND HUMANITIES



17.8% of EU contribution attributed to signed grants flagged as relevant for social sciences & humanities (SSH) representing **EUR 4.4 billion** and **12.9%** of signed grants

DIGITAL AGENDA



27.1% of EU contribution attributed to signed grants contributing to research and innovation in Information and Communication Technologies (ICT) representing **EUR 6.7 billion**

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INTERIM EVALUATION





An interim evaluation of Horizon 2020 was published mid-2017⁵.

It provides an in-depth assessment of the progress of Horizon 2020 towards its objectives, its efficiency, its relevance, its internal coherence but also its coherence with other instruments, and its European added-value.

KEY STRENGTHS OF HORIZON 2020 AT MID-TERM



An attractive, simplified and well-performing programme, highly relevant for stakeholders and societal needs.



On track to deliver **value for money** and **to meet its knowledge-creating objectives**.



Strong **EU Added Value** through unique collaboration opportunities, competition & access to new knowledge.

KEY AREAS FOR IMPROVEMENT IDENTIFIED



Underfunding: Has lower success rates than FP7, especially for high quality proposals, which constitutes a waste of resources for applicants and of good proposals for Europe.



Support for market-creating innovation: Demonstrates potential for breakthrough, market-creating innovation, but it could be strengthened substantially.



Outreach to civil society: Could better communicate the results and impacts of R&I for society, and involve users & citizens more in the agenda-setting & implementation (co-creation).

⁵ SWD (2017) 220 final, Commission Staff Working Document - In-depth interim evaluation of HORIZON 2020; <http://europa.eu/!xH97Rb>

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PROJECT EXAMPLES





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CONQUER

Novel contrast agents to enhance medical imaging

CONQUER is exploring new contrast agents – the substances used in molecular imaging that enhance the contrast between structures or fluids within the body – to paint more accurate pictures of potential injury, infection or disease in patients. The project results aim to provide a theoretical basis for further research, toxicological references, guidelines and imaging instrumentation that will lay the foundations for developing new and innovative technology in the field.

<http://europa.eu/!Ru47Jy>



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E-RARE-3

Extending and strengthening the transnational cooperation on rare disease research

E-Rare-3 aims to close the gap between research and patients with rare diseases. The focus is on coordination of national research and innovation programmes in the field and bringing together not just funding but also huge scope for capacity-building. The collaboration with European Research Infrastructures will be consolidated to enhance efficient and participative research.

https://horizon-magazine.eu/article/anyone-rare-disease-should-benefit-cutting-edge-research-dr-daria-julkowska_en.html



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HINDCON

Building on a 3D solution for resource-efficient construction

The HINDCON project aims to build on the huge cost-saving potential that 'additive manufacturing' (AM) or 3D printing could have on the construction industry. The ultimate goal of the HINDCON project is to incorporate 3D printing technology in manufacturing processes that also involve subtractive manufacturing (SM). HINDCON is currently looking at the best ways of combining AM and SM techniques ahead of building a prototype machine.

<http://europa.eu/!tQ77cK>



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EBODAC

Community engagement drives Ebola vaccine trial in Sierra Leone

Aiming to ensure that the right person takes an Ebola trial vaccine at the right time in Sierra Leone, the EBODAC project is employing a combination of low-tech and high-tech community engagement strategies. Clinical trials were established in communities with no previous exposure to medical research to ensure that communication about the study was clear. Today, 450 adults and 96 adolescents are successfully enrolled in a two-stage vaccine trial.

<http://europa.eu/!wP78PW>



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LINGVIST

Statistics and nuance – the new secrets behind learning a foreign language

This project used statistics to develop the Lingvist app with the hope that users can learn a foreign language faster than other techniques. The implementation of mathematics and computer science makes language-learning software highly adaptive to every individual. Personalisation is what sets apart Lingvist, now in a test phase with 10 language pairs available to learn – and a goal of exceeding 20.

https://horizon-magazine.eu/article/statistics-and-nuance-new-secrets-behind-learning-foreign-language_en.html



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DEEPEGS

Engineers drill world's hottest well hoping for clean energy eruption

Using state-of-the-art drilling technology, engineers have dug more than 4.5 km below the earth's surface in an attempt to harness the endless geothermal energy inside our planet. By testing stimulating technologies for enhanced geothermal systems (EGS) in deep wells in different geologies the project aims to come up with new innovative solutions in order to deliver significant amounts of geothermal power across Europe.

https://horizon-magazine.eu/article/engineers-drill-worlds-hottest-well-hoping-clean-energy-eruption_en.html



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ABIOMATER

Engineering materials for lenses, tissue engineering and implants

The ABIOMATER project aims to develop magnetic material-based devices that ensure lab cells are subject to the same magnetic fields and strains to which they would be exposed in the body. These would make it possible to carry out more accurate research, potentially leading to breakthroughs in fields such as optical devices, biomedical implants, tissue engineering and personalised medicine.

<http://europa.eu/!hX98PK>



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STRENGTH2FOOD

Strengthening European food chain sustainability by quality and procurement policy

The Strength2Food project aims to improve the effectiveness of the EU's food quality schemes, public sector food procurement and to stimulate the development of short food supply chains through research, innovation and demonstration activities. The researchers intend to conduct research and case studies which will feed into recommendations for policy-makers and practitioners.

<http://europa.eu/!Qt48YB>



METHODOLOGY



This brochure focuses on the implementation of Horizon 2020 since its launch. It is based on data collected directly from the Common Research Data Warehouse (CORDA) Portal, using the European Commission's internal reporting tools provided by the Common Support Centre in the Directorate-General for Research and Innovation (DG RTD). The scope includes all calls with a deadline up until 31 December 2016 (329 calls) including grants to named beneficiaries. It includes single-stage calls and the second stage of two-stage calls. It includes calls from the Work Programmes of the Public-Private Partnerships (Joint Undertakings), but not Public-Public Partnerships.

The analysis in this brochure does not include statistics on the Knowledge and Innovation Communities supported by the European Institute of Innovation and Technology nor on the JRC direct actions. Calls belonging to the Research Fund for Coal and Steel do not belong to Horizon 2020, therefore are outside the scope of this report.

The statistics on applications and proposals excludes non-eligible proposals (ex. duplicates, withdrawals, inadmissible, etc.), which represent 1.8% of the total number of proposals submitted, while statistics on participations and projects are based on grants agreements signed before 1 September 2017. Calculations regarding participants are limited to beneficiaries who are signatories to the grant agreement. Other categories of participants, such as "Third Parties", "Partner Organisations" or others do not receive funding directly from the EU, but indirectly from the beneficiaries, and are not computed in the analysis.

This brochure includes also some preliminary statistics related to output of funded projects, in particular publications, patent applications and patent awards. It should be noted that output data is collected through the continuous project reporting made by beneficiaries under their own responsibility.

GLOSSARY



Applicant: Legal entity submitting an application for a call for proposals. When the application is submitted in name of a consortium, then the applicant is the coordinator. A single Applicant can apply in different proposals.

Associated country: Associated countries are third countries that are party to an international agreement with the European Union, as identified in Article 7 of Regulation (EU) No 1290/2013 [Horizon 2020]. They participate in Horizon 2020 under the same conditions as EU Member States. Legal entities from Associated Countries can participate under the same conditions as legal entities from the Member States. Association to Horizon 2020 takes place through the conclusion of an International Agreement. There are 16 Associated Countries: Iceland, Norway, Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, Turkey, Israel, Moldova, Switzerland, Faroe Island, Ukraine, Tunisia, Georgia and Armenia.

Beneficiary: The legal person, other than the European Commission, who is a party to the Grant Agreement.

Call for proposals: Procedure to invite applicants to submit project proposals with the objective of receiving funds from the European Union. This covers all Horizon 2020 calls (1-stage calls and 2nd stage of 2-stage calls).

Civil Society Organisation: Any legal entity that is non-governmental, non-profit, not representing commercial interests and pursuing a common purpose in the public interest.

Definitions of types of organisations

- > **Private for profit companies (PRC):** Private, for-profit entities, including small or medium-sized enterprises and excluding Universities and Higher or Secondary Education Establishments.
- > **Public bodies (excluding research and education) (PUB):** Any legal entity established as a public body by national law or an international organisation.

Excludes Research Organisations and Higher or Secondary Education Establishments.

- > **Research organisations (excluding education) (REC):** A legal entity that is established as a non-profit organisation and whose main objective is carrying out research or technological development.
- > **Secondary and higher education establishments (HES):** A legal entity that is recognised by its national education system as a University or Higher or Secondary Education Establishment. It can be a public or a private body.
- > **Other entities (OTH):** Any entity not falling into one of the other four categories

Eligibility criteria are used to determine whether a proposal meets the requirements to become eligible for a European Union grant. Article 10 of the Horizon 2020 Rules for Participation provide that the following participants are eligible for funding from the Union: (a) any legal entity established in a Member State or associated country, or created under Union law; (b) any international European interest organisation; and (c) any legal entity established in a third country identified in the work programme. The work programme can also apply more specific conditions for particular actions.

Evaluation procedure: Proposals for projects to be funded in Horizon 2020 are evaluated on the basis of selection criteria (financial and operational capacity) and award criteria (excellence, impact, efficiency of implementation). These widely published criteria provide an objective method of choosing, from the great number of proposals often received, the very best projects that most closely meet the objectives of the calls for proposals. In this way, Horizon 2020 funds only high-quality, excellent research and innovation projects. Unless otherwise specified in the conditions of the call for proposals, each of the award criteria is scored between 0 and 5. The total score is calculated as a weighted sum of the scores for each criterion. The default is equal weight for all criteria. For Innovation Actions and the SME Instrument the impact criterion is given a weight of 1.5 to determine the ranking. Other weightings may be specified in the conditions of the call for proposals.

Evaluation threshold: These are the minimum evaluation scores that a Horizon 2020 project proposal must receive in order to be ranked. The default thresholds

are a score of least 3 out of 5 for each individual criterion and a score of at least 10 out of 15 for the sum of the individual scores. The thresholds are applied to unweighted scores. Different thresholds may be specified in the conditions of the call for proposals. Proposals scoring below any of the thresholds will be rejected. **High-quality proposals** are proposals that score above threshold.

FP7: The Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007-13); the Seventh Framework Programme.

Grants to named beneficiaries: Most programme parts of Horizon 2020 have ad hoc calls to named beneficiaries. These calls have no deadline, and encompass projects in many different areas. These correspond to Identified beneficiary actions (in which the legal entities to be granted are listed in the adopted Work Programme) and Specific Grant Agreements (SGA) awarded in the context of Framework Partnership Agreements (FPA), establishing a long-term cooperation mechanism between the Commission/Agency and the beneficiaries of grants. Statistics on these grants are included, unless otherwise specified, especially for computing success rates.

Grant: Grants are direct financial contributions, by way of donation, from the EU budget in order to finance any of the following: a) an action intended to help achieve an EU policy objective; b) the functioning of a body which pursues an aim of general EU interest or has an objective forming part of, and supporting, an EU policy ('operating grants').

Grant Agreement: A contract concluded between the European Commission (representing the European Union) and the beneficiary (or beneficiaries) under which the parties receive the rights and obligations (e.g. the right of the Union's financial contribution and the obligation to carry out the research and development work). It consists of the basic text and annexes.

Member State: A state that is party to treaties of the European Union and thereby subject to the privileges and obligations of European Union membership: AT- Austria;

BE – Belgium; BG – Bulgaria; CY – Cyprus; CZ – Czech Republic; DE – Germany; DK – Denmark; EE – Estonia; EL – Greece; ES – Spain; FI – Finland; FR – France; HR – Croatia; HU – Hungary; IE – Ireland; IT – Italy; LT – Lithuania; LU – Luxembourg; LV – Latvia; MT – Malta; NL – Netherlands; PL – Poland; PT – Portugal; RO – Romania; SE – Sweden; SI – Slovenia; SK – Slovakia; UK – United Kingdom.

Newcomer: Horizon 2020 Participant who was not involved in a FP7 Project (not a FP7 participant).

The **overall success rate** of proposals is calculated according to the following formula: $(\text{number of retained proposals}) / (\text{number of eligible proposals}) * 100$. The success rate of applications is calculated according to the following formula: $(\text{number of applications in retained proposals}) / (\text{number of applications in eligible proposals}) * 100$.

Participant: Any legal entity carrying out an action or part of an action under Regulation (EU) No1290/2013 [Horizon 2020] having rights and obligations with regard to the European Union or another funding body under the terms of the Horizon 2020 Rules for Participation (Regulation 1290/2013). A single Participant can be involved in multiple Projects through multiple **participations**.

Projects are successful proposals for which a Grant Agreement is either "signed" or "under signature".

A **proposal** is submitted by one or more applicants. Proposals could have just one **applicant** – a single principal investigator – while multi-partner proposals group together many applicants. An applicant might also be involved in more than one proposal, in which case it is involved in multiple **applications** for funding.

Eligible proposals are submitted proposals that after evaluation are not considered "ineligible", "inadmissible", "cancelled" or "duplicate". **Retained proposals** are proposals retained for funding after evaluation. This category does not include proposals retrieved from the reserve list at later stage. **Rejected proposals** are

proposals that after evaluation are considered “rejected” or “withdrawn”. A **successful proposal** is a proposal that has been selected after final evaluation. This category includes proposals retrieved from the reserve list at later stage.

Some calls have two stages: applicants first submit outline proposals, which are evaluated to select those that could be developed further into **full proposals**. The statistics on proposals presented in this publication refer only to full proposals. If the proposal is successful and is awarded funding it becomes a project, which is implemented by one or more **participants**. A participant might be involved in other projects, in which case it has a number of **participations**.

Small or Medium-Sized Enterprise (SME): A micro, small or medium-sized enterprise within the meaning of Recommendation 2003/361/EC. Necessary (but not sufficient) conditions for being an SME are a number of employees smaller than 250 and an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million. These ceilings apply to the figures for individual firms only. A firm which is part of larger grouping may need to include employee/turnover/balance sheet data from that grouping too.

Third Country: A state that is not a Member State of the EU. For the purposes of presentation of information in this brochure, “third country” does not include Associated countries. These are countries other than EU Member States, Overseas Countries and Territories, Associated Countries, and Members of the European Free Trade Association (EFTA).

Two-stage call: The proposal coordinator submits a short proposal that is evaluated; successful proposals are invited to submit a full proposal. The evaluation of this full proposal leads to an ordered list to be forwarded to the Commission for ranking selection.

A more extensive list of definitions can be found at: <http://bit.ly/H2020Glossary>

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For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex at: <http://eur-lex.europa.eu>

OPEN DATA FROM THE EU

The EU Open Data Portal (<http://data.europa.eu/euodp/en/data>) provides access to datasets from the EU. Data can be downloaded and reused for free, both for commercial and non-commercial purposes.

Three years on since its launch Horizon 2020 has become, as this brochure shows, a very popular and successful touchstone for excellent research and innovation. It empowers researchers, innovators and industry to tackle big common challenges, achieving Europe-wide critical mass in doing so. It builds momentum for research and innovation as a strong investment in our future. We must now capitalise on this momentum and build on achievements to date so that Horizon 2020 can perform even better during its second half, preparing the ground for the successor programme, and ensuring that its results can have a real impact on our economy, society and environment.

