

Swiss Participation in European Research Framework Programmes

Facts and figures 2015



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**

Contact

State Secretariat for Education, Research and Innovation (SERI)

Einsteinstrasse 2, CH-3003 Bern

Tel. +41 58 463 50 50, europrogram@sbfi.admin.ch

www.h2020.ch

Impressum

Publisher: State Secretariat for Education, Research and Innovation (SERI)

Editorial team: Roland Bühler, Christophe Koller, Lisa Müller, Xavier Reymond, Patrice Soom, Marius Stoll,
Claude Vaucher

Layout: Thomas Lüthi, Christel Jeckelmann

Translation: SERI Language Services

Printed by: Federal Office for Buildings and Logistics (FOBL)

Languages: German, French and English

ISSN: 2296-3871

Contents

1	Summary	5
2	Introduction	9
2.1	About this report	9
2.2	The Research framework programmes of the European Union.....	9
2.3	Switzerland in the EU research framework programmes.....	10
2.4	The history of the research framework programmes	11
2.4.1	Development of the overall FP budget.....	12
2.4.2	Characteristics of the eight generations of programmes to date	13
3	Development of Swiss participation in the FPs	16
3.1	Swiss participation in the FPs 1992–2015	16
3.2	Breakdown of FP contributions by type of institution	17
3.3	Funding of Swiss research under the FPs 1992–2015	18
4	Swiss participation in FP7 2007–2013	19
4.1	Introduction	19
4.2	Structure of FP7	19
4.3	Breakdown of Swiss participations by type of institution	22
4.3.1	Project participations and project coordinations by type of institution	22
4.3.2	Contributions by type of institution	23
4.4	Analysis by research area.....	24
4.4.1	Number of participations by research area.....	24
4.4.2	Contributions by research area.....	25
4.4.3	Intensity and quality of Swiss participations by research area	27
4.5	Analysis based on other criteria	32
4.5.1	Participation by gender	32
4.6	Switzerland and Europe compared	33
4.6.1	Number of participations per country.....	33
4.6.2	Number of coordinations per country.....	34
4.6.3	Distribution of committed contributions among participating countries	35
4.6.4	Success rate of project proposals.....	36
4.7	Financial aspects of Swiss participation	37
4.7.1	Past framework programmes resulted in Switzerland receiving a net inflow of European research funding	37
4.7.2	Favourable competitiveness indicator for Swiss research	37
4.7.3	Provisional financial balance sheet of Swiss participation in FP7	38
4.7.4	Impact of the exchange rate on research funding actually allocated to researchers in Switzerland	38
5	Swiss participation in Horizon 2020 (2014–2020)	39
5.1	Introductory remarks	39
5.2	Structure of Horizon 2020 and Switzerland's current status	39
5.3	National transitional measures.....	43
5.3.1	SERI's measures	43
5.3.2	Temporary Backup Schemes of the Swiss National Science Foundation	43

5.4	Swiss participations and coordinations by type of institution	44
5.5	Swiss participations by programme area	47
5.6	Switzerland and Europe compared	49
5.7	Financial aspects	52
5.8	Conclusions	52
6	Initiatives under Articles 185 and 187 TFEU	54
6.1	Initiatives under Article 185 TFEU	54
6.2	Initiatives under Article 187 TFEU	56
7	Swiss participation in the Euratom research programmes	58
7.1	General points	58
7.2	Nuclear fusion area of the Euratom research programmes	59
7.2.1	Context	59
7.2.2	Swiss participation between 2007 and 2013 (apart from ITER).....	59
7.2.3	Swiss participation as of 2014.....	60
7.3	Nuclear fission area of the Euratom research programmes	61
8	Swiss participation in ITER	62
8.1	Context	62
8.2	Swiss participation in ITER (2007–2014).....	62
8.3	Swiss Participation as of 2014	64
	Appendix A: Methodological explanations.....	65
	Appendix B: Abbreviations	66
	Appendix C: Tables	68

1 Summary

Introduction

Structure of the report

This report has been prepared as part of the regular reporting on Swiss participation in the framework programmes of the European Union for research, technological development and demonstration (FPs) in accordance with the mandate of the Swiss Parliament.

The report focuses on two research framework programmes: it provides firstly a near-exhaustive assessment of FP7 (2007-2013) and secondly presents the initial results of FP8 (2014-2020; Horizon 2020). However, these initial results are not yet robust as only limited data is available so far.

Compared with the 2007-2012 interim review, this report includes a new section on initiatives under Articles 185 and 187 of the Treaty on the Functioning of the European Union, both of which are programmes co-financed by the FP (Section 6). There are also new sections on the Euratom fusion research programme (Section 7) and Switzerland's participation in the International Thermonuclear Experimental Reactor ITER (Section 8).

How the European Framework Programmes for Research work

The FPs are the EU's main instruments for implementing its common science and innovation policy. Applications for projects under the FPs are jointly prepared by researchers from one or more countries, normally in response to specific EU calls for proposals, and are evaluated by independent experts. This means that the EU research funds are awarded to scientific institutions and companies from the participating countries on a competitive basis, the key criterion being the excellence of the projects. There are no national quotas.

FPs are financed partly by the EU Member States via their regular contributions to the EU and partly by contributions from associated countries in proportion of their gross domestic product (GDP). Participants from non-associated countries (third countries) may only take part in projects if they finance their participation themselves.

Since their inception, the FPs have seen their budgets steadily increase. The various thematic points of emphasis and instruments have continuously adapted to Europe's social and political needs.

Switzerland's participation in the FPs

Participation in the EU's research framework programmes is one of the priorities of Swiss science policy. Switzerland's participation in the FPs takes a variety of forms:

1987-2003 FP1-FP6	Third country
2004-2013 FP6 and FP7	Full association
2014-2016 Horizon 2020 (FP8)	Partial association

Research Framework Programmes

Seventh European Research Framework Programme

FP7 lasted from 2007 until 2013 (cf. Appendix C, Table 6). Defining features of the programme were its large overall budget (EUR 51.7 billion excluding the Euratom fusion research programme) and significant support for fundamental research via the introduction and implementation of the "Ideas" programme. Bottom-up organised, this programme was administered by the European Research Council (ERC) and had access to significant financial resources (EUR 7.5 billion). However, most of FP7 resources (EUR 32.4 billion) were allocated to the "Cooperation" programme which was focused on transnational research cooperation and exchanges between the public and private sectors and was subdivided into several thematic areas (e.g. health, information and communication technologies [ICT], energy, environment, transport, space). The "People" programme, finally, included the Marie Curie Fellowships (MCA), which were endowed with a budget of EUR 4.8 billion.

CHF 2482.1 million (4.2% of all EU contributions) were committed to Swiss research and innovation institutions which had a total of 4269 participations, including 972 project coordinations. 39.2% of this amount (CHF 953.5 million)

went to the institutions of the ETH Domain, 28.0% went to the universities and 3.2% to the universities of applied sciences. CHF 543.7 million (21.9%) went to Swiss companies, with CHF 321.3 million going to small and medium-sized enterprises (SMEs). Swiss companies mainly benefited from the "Cooperation" programme and received 20.5% of the funds awarded to Swiss institutions under this programme. The FP was therefore the most important source of public funding for research and innovation for Swiss companies and in particular SMEs.

The most important programme areas from the perspective of Swiss institutions are: ERC (30.4% of contributions to Swiss institutions), ICT (18.4%), MCA (11.7%), Health (10.2%), and Nanosciences, Nanotechnologies and New Production Technologies (8.3%). Project proposals involving at least one Swiss research institution are characterised by an excellent quality, with an average success rate of 24.1%, as compared to the European average of 21.2%. In the "Ideas" programme the results are even better, with an average success rate of 23.8% as against a European average of 11.1%.

The Swiss Confederation transferred a total of CHF 2263.1 million to the European Union for Switzerland's participation in FP7. In return, funding totalling CHF 2482.1 million was committed to Swiss institutions. This means that, subject to final settlement of the EU accounts, Switzerland benefits from a net return flow of CHF 219 million.

Horizon 2020 (8th Research Framework Programme)

Horizon 2020 also runs for a seven-year period from 2014 to 2020 (cf. Appendix C, Table 1). The programme has essentially taken over the thematic priorities of FP7, but is organised slightly differently, around three main pillars. To date (as of 15 July 2015), around 9% of the total Horizon 2020 budget for participants in this European programme were committed. The Horizon 2020 budget amounts to EUR 82.3 billion, including funding for Euratom and ITER. Compared to FP7, the budget for FP8 has been increased by more than 50%.

As of 15 July 2015, there were a total of 18,158 project participations in Horizon 2020, for which EUR 7.4 billion were committed. For political reasons in connection with the acceptance of the "mass immigration" initiative in early 2014, Switzerland is for the time being only partially associated to Horizon 2020 (until end of 2016). Switzerland is associated to the first pillar (Excellent Science) and Euratom, but has third-country status with regard to the second (Industry Leadership) and third (Societal Challenges) pillars.

Switzerland counts 318 project participations so far (1.8% of all participations in the framework of Horizon 2020 to date), for which contributions amounting to CHF 172.4 million have been awarded (2.2% of all contributions). These funds originate either from the EU or, for the most part, from the Swiss Confederation (81.5%). Fifteen projects are coordinated from Switzerland (0.3% of all project coordinations). Switzerland's participation is strongest in the areas ICT (16.7%), Marie Skłodowska-Curie Actions [MSCA] (12.6%) and Health (11.0%). These are also the three most successful areas in terms of the contributions committed to Switzerland: 20.3% for ICT, 13.9% for Health and 12.1% for MSCA.

The ETH Domain (113 participations, 35.5%) and the universities (54 participations, 17.0%) have traditionally been very active participants in the European research framework programmes. However, SMEs now rank in between the ETH Domain and the universities (55 participations, 17.3%). This is a new phenomenon and is partly due to Switzerland's exclusion from the first two calls for grant applications from the European Research Council (ERC).

Although success rates in Horizon 2020 are generally lower than in FP7, the success rate of Swiss institutions are still excellent by international comparison.

Other participations by Switzerland

Initiatives under Articles 185 and 187 TFEU

In the area of public-public partnerships (P2P) within FP7, Switzerland participated in four research and innovation programmes under Article 185 of the Treaty on the Functioning of the European Union (TFEU)¹: 1) Eurostars, 2) European & Developing Countries Clinical Trials Partnership (EDCTP), 3) Ambient Assisted Living (AAL) and 4) European Metrology Research Programme (EMRP).

In FP7, three of these four initiatives (Eurostars, AAL and EMRP) were implemented by a total of 183 projects including Swiss partners. The "Swiss" projects show a higher-than-average success rate (27 to 59%). Around CHF 27 million

¹ Official Journal C 326, 26/10/2012 p.0001–0390

of the funding came from FP7, while Switzerland contributed CHF 54 million. Self-financing by the participating Swiss companies amounted to CHF 88 million.

The Joint Technology Initiatives (JTIs) are undertaken jointly by the European Union and European industry in accordance with Article 187 TFEU. Five JTIs were established under FP7: 1) Clean Sky in the field of aviation, 2) Innovative Medicines Initiative (IMI) in the field of drug research, 3) Fuel Cells and Hydrogen (FCH), 4) ENIAC in the field of nanoelectronics and 5) Advanced Research and Technology for Embedded Intelligence and Systems (ARTEMIS) for embedded electronic systems. Switzerland participated in all but the last of these initiatives. The European Union supported these initiatives with EUR 3.12 billion which were supplemented by EUR 4.66 billion from the industry. Swiss research players received around CHF 71 million for their participation in these initiatives. The Swiss Confederation made additional contributions in this area.

Euratom

The Euratom programme, which was established in 1958, covers the two areas of nuclear fusion and nuclear fission. Between 2007 and 2013, Switzerland contributed EUR 8.8 million to the fusion research programme and received project funding totalling EUR 20.5 million. Moreover, Switzerland's contribution helped finance research activities in the JET reactor in the United Kingdom, for which the industrial return is impossible to quantify. In the context of its partial association to Horizon 2020, Switzerland also participates in the fusion research programme.

Under the FP7 nuclear fission programme, CHF 18.2 million were awarded to 58 participants from Switzerland by the European Commission, while Switzerland's contribution to the programme amounted to CHF 14.3 million. Switzerland's research activities are focused on the areas "Reactors and Safety" (27 participations) and "Radioactive Waste" (18 participations). In Horizon 2020, 14 Swiss participants have been funded so far (with a total of CHF 5.1 million).

ITER

Launched in 2007, the International Thermonuclear Experimental Reactor (ITER) is a new dedicated nuclear fusion research facility of global importance. It is currently under construction in Cadarache (France). Its main objective is to demonstrate the energy efficiency of nuclear fusion. Europe, the United States of America, China, South Korea, Japan, India and Russia are the seven partners in this project. Europe is responsible for the lion's share of the construction of ITER (six parts out of eleven). Because of its complexity, the reactor is unlikely to start operations before 2023.

Switzerland's financial contribution is being made through the European Union (until 2013 through the Euratom programme). By 2014, Switzerland had already invested around EUR 130.9 million. Many Swiss companies supply components for ITER. By the end of 2014, they had received contracts totalling EUR 76.1 million. Switzerland will continue its participation in ITER until at least the end of 2016.

Outlook

Swiss participation in Horizon 2020

Due to the result of the referendum held on the initiative against mass immigration on 9 February 2014 and Switzerland's consequent renoucement to sign the Croatia Protocol, the European Union has rejected Switzerland's full association to the whole Horizon 2020 package.

On 5 December 2014, Switzerland and the EU signed an agreement on a partial association which had already been applied since 15 September 2014 and will remain in place provisionally until the end of 2016. Since 15 September 2014, this partial association has enabled researchers in Switzerland to resume their participation as associated and equal partners in all activities of the first pillar of Horizon 2020, which includes ERC grants, the Marie Skłodowska-Curie Actions, Future and Emerging Technologies (FET) and research infrastructures. Researchers in Switzerland can also participate as associated partners in Euratom and the programme section "Spreading Excellence and Widening Participation". As associated partners, researchers in Switzerland are once again funded directly via contributions from the EU.

For all other calls for proposals under Horizon 2020 (second and third pillars), Switzerland remains a third-country. In these programme areas Swiss partners can join European collaborative projects, but do not receive any direct EU funding for their part of the project. On 25 June 2014, the Federal Council therefore decided to introduce some transitional measures. The Secretariat of State for Research, Education and Innovation (SERI) provides direct funding for researchers in Switzerland whose participation in collaborative projects under Horizon 2020 is not funded by the European Commission.

From 2017, Switzerland will either once again be fully associated to Horizon 2020, or its participation in the whole programme will be relegated to third-country status. Which scenario materialises will depend on the continuation of the free movement of persons in Switzerland and its expansion to include Croatia. The Federal Council is still working on implementing the decision of the Swiss electorate on a coordinated basis and in the interests of the persons concerned, whether Swiss or EU nationals. The stated aim remains full association of Switzerland to Horizon 2020 from 2017 onward.

Developments

An initial comparison of the data for FP7 with the data for Horizon 2020 shows a massive decline in Swiss participation in Horizon 2020, in terms of both numbers of participations and financial contributions. The decline is even more evident with regard to the number of Swiss coordinations compared to FP7. These developments may be due to the EU's response to Switzerland's participation status.

	FP7 (2007-2013)	Horizon 2020 (2014-2015)
Proportion of Swiss participations	3.2% (4269)	1.8% (318)
Proportion of contributions received	4.2% (CHF 2482 m)	2.2% (CHF 172 m)
Proportion of Swiss coordinations	3.9% (972)	0.3% (15)

NB: Values show percentage of European total; figures in brackets give absolute numbers of participations, contributions and coordinations.

If Switzerland were to be fully downgraded to third-country status from 2017 onward, its opportunities for participation and influence would be extremely limited. We could also expect to see an even sharper decrease in the financial and quantitative shares of Swiss participation in the FPs. A further concern would be the potential isolation of Swiss-based researchers. The fear is that over the long term, third-country status could lead to a loss of expertise and could reduce Switzerland's influence in research circles, both in Europe and indeed globally.

2 Introduction

2.1 About this report

This publication has been prepared as part of the regular reporting on Swiss participation in the European Union's research framework programmes (FPs) in accordance with the mandate of the Swiss Parliament.

In Section 3, the report includes facts and figures on the general trend of Swiss participation in the FPs. Section 4 focuses on FP7, which ran until the end of 2013 and for which near-final results are now available for the first time (most recent data from 6 October 2014). This section therefore takes up the most space in the report. In addition, Section 5 gives an initial insight into Switzerland's participation in Horizon 2020 from 1 January 2014 to 15 July 2015. For the first time Section 6 also presents supplementary data on the research and development programmes undertaken between the EU and a number of Member States or associated countries under Art. 185 TFEU ("public-to-public partnership" principle – P2P), as well as on the Joint Technology Initiatives (JTI) between industry and the public sector under Art. 187 TFEU ("public-private partnership" principle – PPP). Finally, Sections 7 and 8 examine Switzerland's participation in the Euratom programme and the international ITER project.

2.2 The Research framework programmes of the European Union

The science and technology policy of the European Union (EU) is defined in the Treaties of Maastricht and Amsterdam. Its importance increased with the Lisbon Strategy agreed upon in 2000. The aim of establishing a "European Research Area" (ERA) is to pave the way for Europe to become the world's most competitive and dynamic knowledge-based economic area. The FPs are the main instrument for putting this vision into practice. These multiannual funding programmes create incentives for transnational research cooperation and cooperation between public-sector institutions and industry actors. The FPs are prepared by the European Commission (EC) in consultation with Member States and by taking account of the principle of subsidiarity. Tailor-made programme areas support careers in science, bottom-up fundamental research, market-oriented research and innovation, and research projects relating to the most important social challenges facing Europe.

The first framework programme began in 1984. The eighth generation programme, known as "Horizon 2020 – the EU Framework Programme for Research and Innovation", has already been underway since 1 January 2014. Horizon 2020 will run until 2020 and has a total budget of EUR 82.3 billion. Previously operated in parallel, the European Atomic Energy Community's programme for nuclear research and training activities ("Euratom programme") is now an integral part of Horizon 2020.

FPs are financed partly by the EU Member States via their regular contributions to the EU and partly by contributions from associated countries in proportion to their gross domestic product (GDP). Project proposals are prepared either by researchers from a single country only (in the case of individual projects) or jointly by research partners from several European countries (in the case of collaborative projects). Applications are submitted in response to specific calls for proposals from the EC. Once received, applications are assessed by independent experts from the relevant specialist areas and, if successful, are funded by the EC.

With a few exceptions, calls for proposals for individual projects are only open to members of institutions from EU Member States or associated countries. In the case of collaborative projects, researchers working at an institution in a third country are also eligible to participate. Third countries refers to countries that are neither an EU Member State nor an associated country. Third-country participants do normally not receive funding contributions from the EU, however.

All project proposals are solely selected on the grounds of their quality, i.e. according to specific criteria such as technical and scientific aspects and socio-economic importance. There are no national quotas. This means that EU research funds flow back to the participating countries on a competitive basis for the benefit of the best scientific institutions and companies.

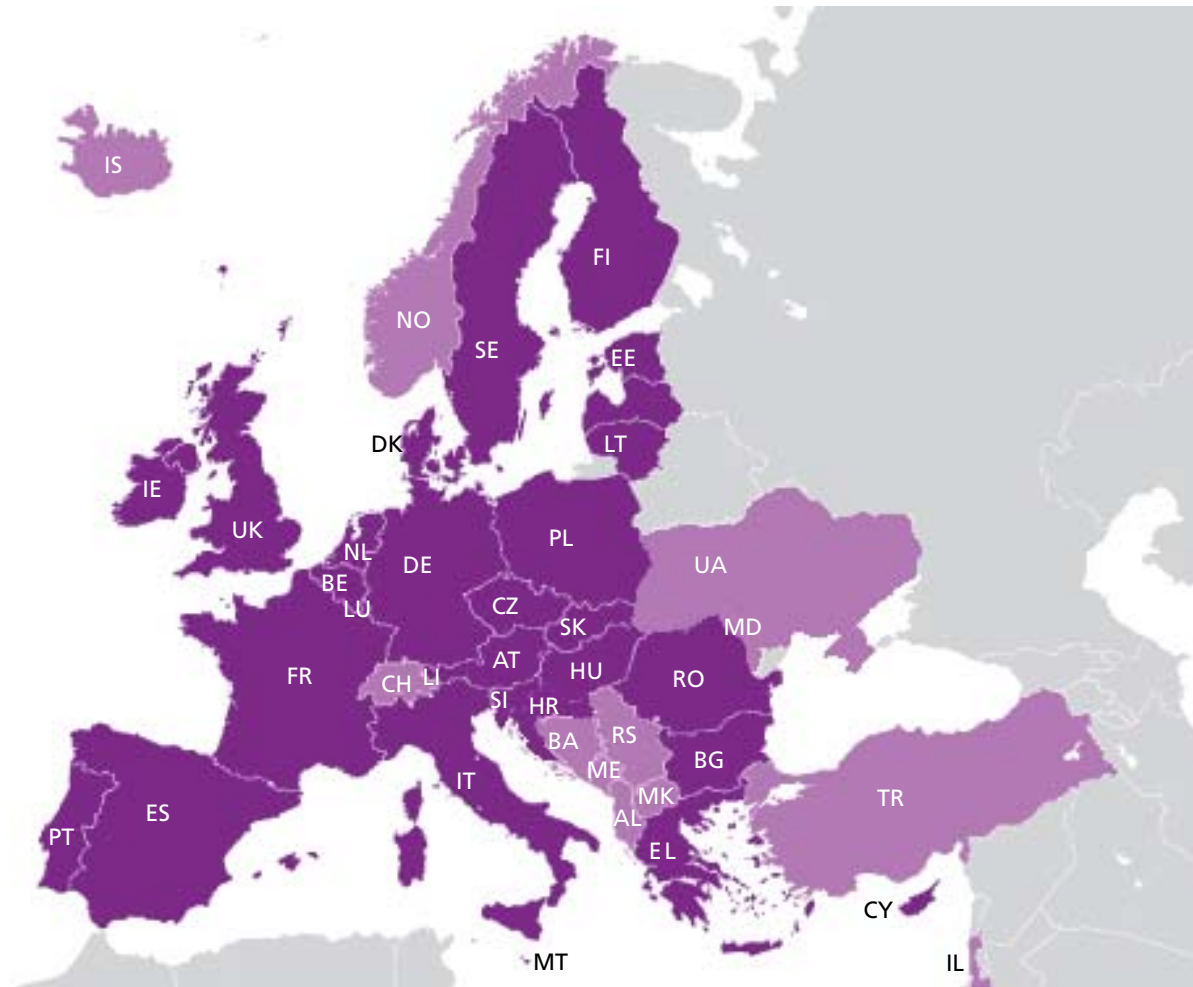
2.3 Switzerland in the EU research framework programmes

Participation in the FPs is one of the priorities of Swiss science policy. Researchers from Swiss universities and the private sector have been participating in the framework programmes since 1987. Since then, there has been a steady increase in the number of participations and total contributions: whereas under FP3 (1990–1994) 501 Swiss participations received funding totalling just under CHF 127 million, the figures rose to 4269 participations and total contributions of just under CHF 2482 million under FP7 (2007–2013). The FPs are the second most important source of public funding for researchers in Switzerland after the Swiss National Science Foundation (SNSF).

The following details explain the legal status of Switzerland in the FPs and the resulting participation opportunities for researchers in Switzerland at different times:

- Until the end of 2003, researchers at institutions based in Switzerland only had limited opportunities to take part in projects of the FPs (as third-country participants) and had to do so on a self-funding basis or with funding from the Swiss Confederation.
- From 1 January 2004, an agreement between Switzerland and the EU (follow-up agreement to the research agreement in the Bilateral Agreements I) enabled Switzerland to participate in FP6 as an associated country with all rights and obligations. In 2007, this agreement was renewed for the whole of FP7. As a result, from 2004 onward Switzerland paid annual mandatory contributions to the overall budget of the FPs from which successful applicants from Switzerland were funded directly. Swiss partners were now also permitted to coordinate whole projects. Associated status also meant that official Swiss delegates could sit on the management committees of the specific programmes, as well as on various steering committees. This gave Switzerland direct access to information and enabled it to participate in the implementation of current EU research framework programmes and to contribute to the design of future programmes.
- Fully associated status for Switzerland was also envisaged for FP8 – Horizon 2020, including Euratom. However, the adoption of the popular initiative "Against mass immigration" in Switzerland on 9 February 2014 blocked the ongoing negotiations. Instead, as a result of a new understanding between the two sides, 5 December 2014 saw the signing of an agreement on a partial association which has already been applied since 15 September 2014 and will remain in force provisionally until the end of 2016. This means that Switzerland is continuing to participate in certain components of Horizon 2020 as an associated country. In the other areas of Horizon 2020, Switzerland counts as a third country (cf. Section 5.2). With a few exceptions, researchers in Switzerland can also participate in these components of the programme and submit relevant proposals, but they do not receive any funding from the EU. On 25 June 2014, the Federal Council therefore decided that the Swiss Confederation will revert to providing direct funding for Swiss partners who do not receive any EU funding for their participation in collaborative projects within Horizon 2020, as was the case before 2004. Whether Switzerland will regain fully associated status from 2017 onward or will find itself relegated to third-country status in all programme areas depends on whether the free movement of persons is maintained in Switzerland and is extended to Croatia.

Figure 1: Member States and associated countries in the European research framework programmes (Status as of 17 April 2015).



■ Member State ■ (Partially) associated State

Blue: EU Member States. Purple: associated or partially associated. Source: European Commission; for country abbreviations see Appendix C, Table 12

2.4 The history of the research framework programmes

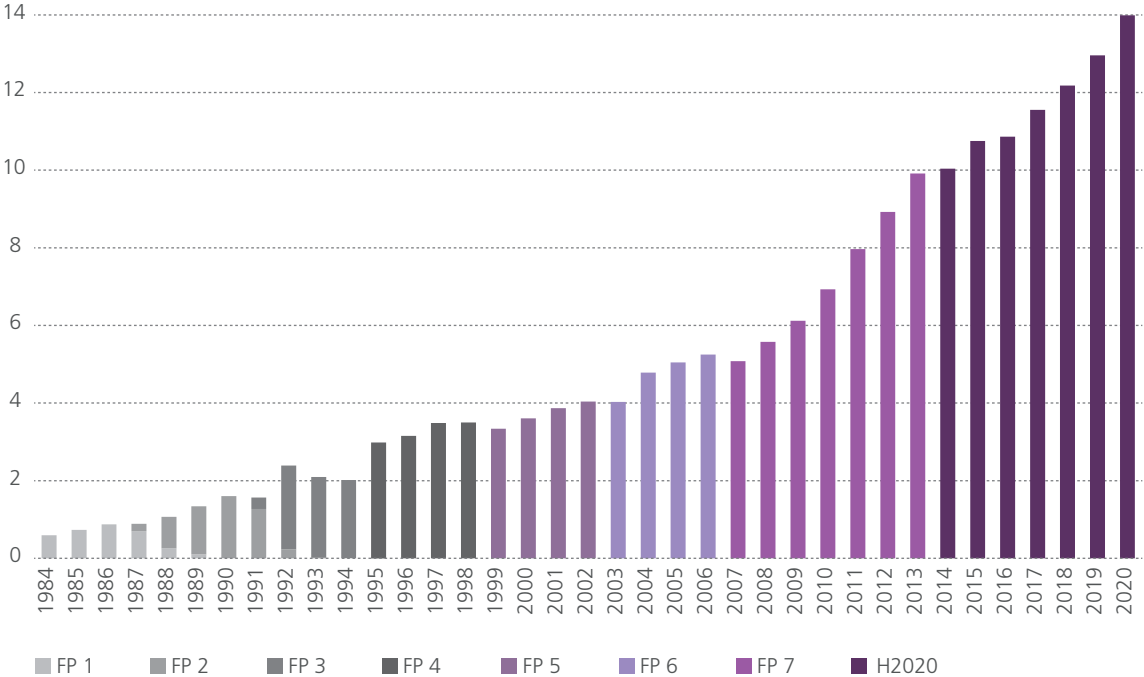
The history of the FPs dates back to the 1950s: in 1957 a joint research facility devoted mainly to nuclear fission began operations in the framework of the Euratom Treaty for the peaceful use of nuclear energy. In 1983, the then French President François Mitterrand proposed the ESPRIT programme covering the field of information technology and telecommunications. On 25 July 1983, a European Council resolution introduced "framework programmes for Community research, development and demonstration activities" (FP) with the aim of combining all of the Community's research activities.² A year later, in 1984, the first framework programme was launched. The budget of the FP steadily increased over time. Its content also changed over the years, in line with the EU's political needs.

² Council resolution on framework programmes for Community research, development and demonstration activities and a first framework programme 1984 to 1987, 31983Y0804(01), adopted on 25 July 1983, OJ of 4 August 2003, p.1, came into force in 1984, repealed on 31 December 1987. In EU terminology a decision is referred to as a resolution.

2.4.1 Development of the overall FP budget

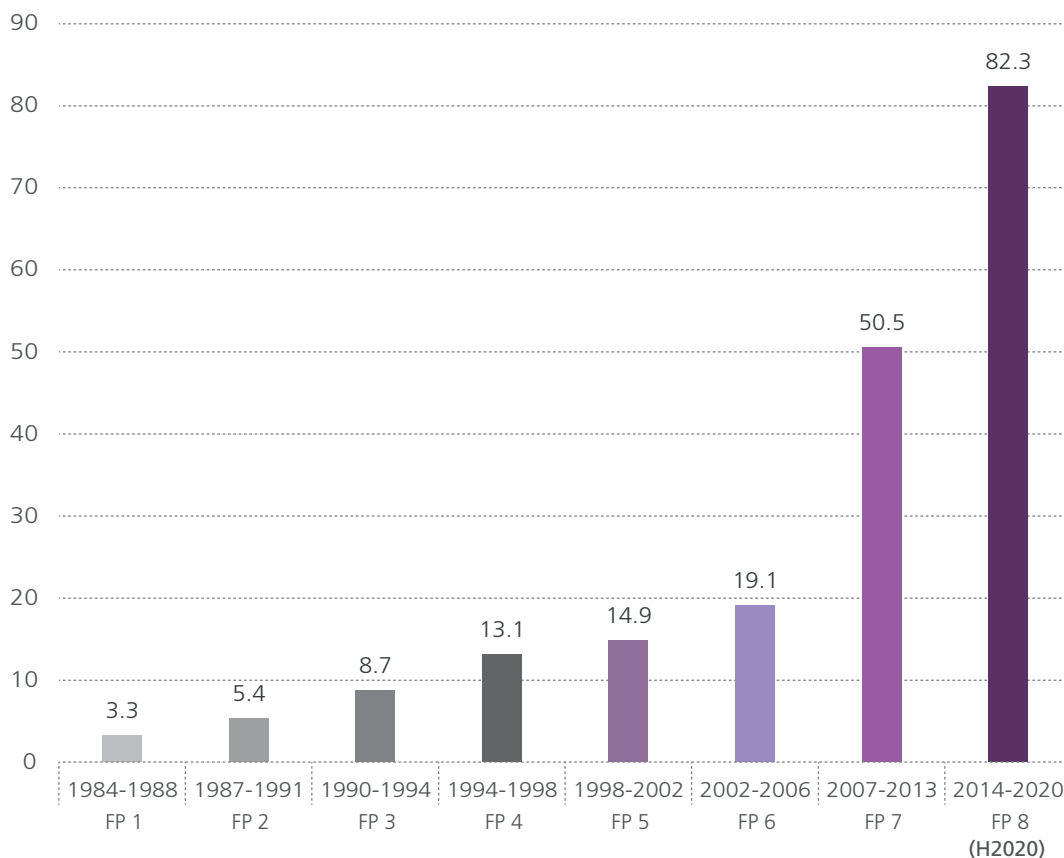
Whereas the budget for FP1 was set at an average of EUR 0.6 billion per year, the average annual budget for FP6 between 2003 and 2006 came to EUR 4.8 billion. In line with the Lisbon Strategy, the EU substantially increased the budget for FP7: from EUR 5.1 billion in 2007 to EUR 9.9 billion in 2013. This meant a total budget of around EUR 50.5 billion. At EUR 82.3 billion, the budget earmarked for the Horizon 2020 package (including the Euratom programme) was significantly larger. A budget of EUR 10 billion was allocated for 2014. The annual budget was originally intended to then steadily rise to EUR 14 billion by 2020. However, in accordance with the European Parliament's decision of June 2015 to back the European Fund for Strategic Investments (EFSI), the funding for Horizon 2020 was cut by a total of EUR 2.2 billion and the annual budgets were adjusted accordingly.

Figure 2: Annual budgets of the European Framework Programmes for Research (in EUR billion, at current prices)



Sources: European Commission (COM(2004) 533, 786/2004/CE, COM(2005) 119 final, SEC(2014) 357 final), cf. Table 1

Figure 3: Development of the budget for the Framework Programmes for Research (in EUR billion, at current prices)



Source: European Commission, SERI, cf. Table 2

2.4.2 Characteristics of the eight generations of programmes to date

FP1 (1984–1988)

The first Framework Programme had a budget of 3.3 billion euro equivalents and ran for a five-year period. It covered the energy sector (with a large proportion of nuclear fission), which accounted for about 50% of its budget, as well as information and communication technologies (ICT, 25%), industry and materials (11%) and life sciences and the environment (10%). The rest of the budget was allocated to measures to promote researcher mobility and scholarships for young scientists.

In 1986, Switzerland and the then European Communities signed a Framework Agreement on Scientific and Technological Cooperation, which explicitly provided for Switzerland's participation in the FPs and remains valid to this day.

FP2 (1987–1991)

With the Single European Act of 1987, science became a responsibility of the Community for the first time. The same year saw the launch of FP2: Significant changes were made to the areas of research. Information and Communication Technologies (ICT) now accounted for 40% of the total budget of 5.4 billion euro equivalents at the expense of energy, which saw its share shrink to 20%. Industry and materials almost doubled their share, while new specific programmes such as support for SMEs and international cooperation were added. On 1 January 1988, the first Swiss project under the European research framework programmes was submitted by EPF Lausanne (EPFL).

FP3 1991 -1994

The budget for the third Framework Programme amounted to EUR 8.7 billion. Information and communication technologies still represented the largest area of research, although their share decreased by 5 percentage points compared to FP2. The importance of the energy sector also continued to decline, while life sciences (health and nutrition) saw their relative share of the budget increase. FP3 still focused on the exact and natural sciences and was subdivided into four thematic programmes: Enabling technologies (ICT, as well as industrial and materials technologies), man-

agement of natural resources (environment, energy and life sciences), management of intellectual resources (scholarships and mobility) and centralised actions for the dissemination and exploitation of the knowledge resulting from the specific programmes.

FP4 (1995–1998)

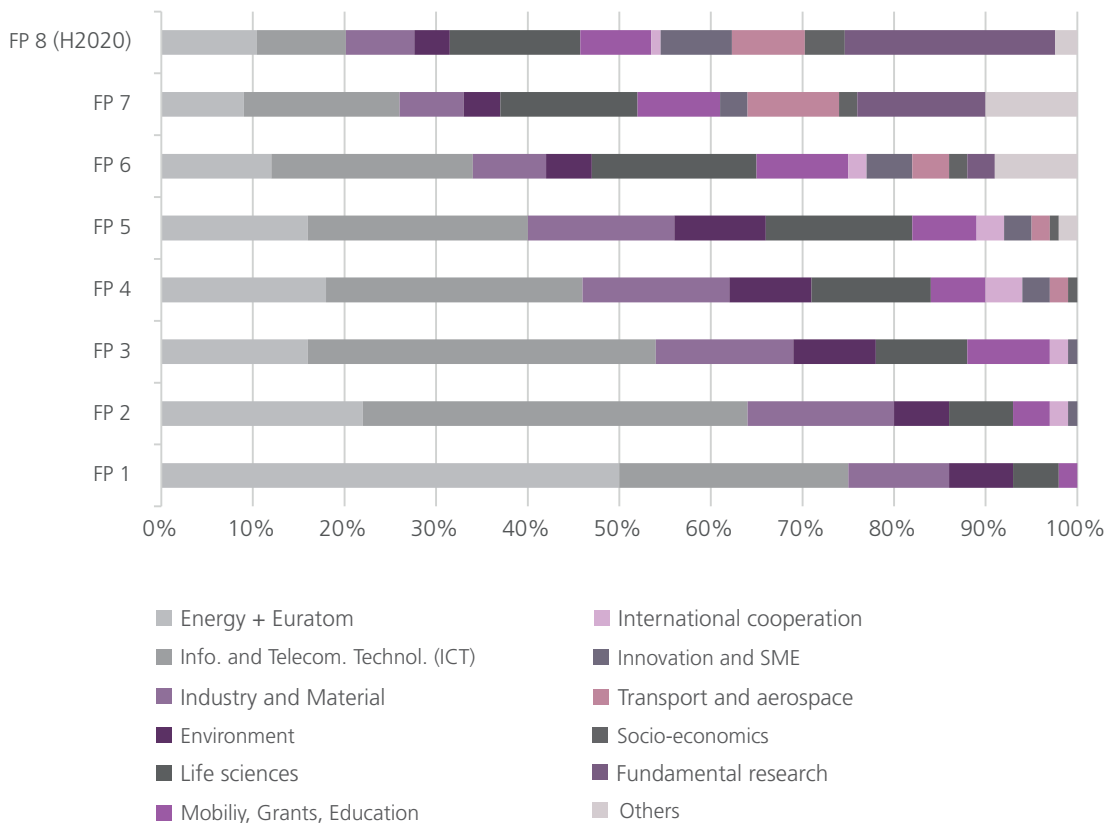
The fourth Framework Programme represented a significant step forward in both financial and organisational/thematic terms compared with the previous programme. The total budget increased from 8.7 to 13.1 billion euro equivalents. 87% of the budget was allocated to the six thematic areas of research (ICT, industry, environment, life sciences, energy and transport). In addition, three horizontal programmes were implemented: 1) International cooperation, 2) Dissemination and exploitation of results, and 3) Greater promotion of researchers training and mobility. Under the programmes up to and including FP4, all participants in a project received roughly the same amount. The coordinators were an exception, each being allocated 10–15% more.

FP5 (1999–2002)

The fifth Framework Programme differed little from its predecessor. In terms of content it was scaled back to four thematic programmes, and the three horizontal programmes were retained under different names. At 14.9 billion euro equivalents, the overall budget also underwent little change. The scale of certain projects increased considerably during the course of the programme. More than 80 partners were involved in some projects. However, there were sometimes major differences in the distribution of funds within projects: some partners performed more important tasks than others and received significantly higher proportions of the budget accordingly.

Under the programmes up to and including FP4, the Commission had paid particular attention to the participation of partners from European regions with less experience of European research projects. This criterion was dropped in FP5.

Figure 4: Relative development of the thematic priorities of the research framework programmes



Source: European Commission, SERI, cf. Table 2

FP6 (2003–2006)

The sixth Framework Programme had a budget of EUR 19.1 billion (including Euratom). It had a different structure than the previous generation of programmes. The bulk of the budget continued to be allocated to thematic areas such as ICT, health, sustainable development and transport. The horizontal programmes now served to structure the European Research Area (a term first used at that time). Euratom was one of the main activities and was run as a separate programme component.

Overall, a refinement of the themes was observed. For the first time, fundamental research made up an area in its own right. In addition, two new instruments were created with the aim of ensuring the sustainable integration of partners' research capacities in a joint programme of activities. These were firstly the integrated projects – large-scale projects covering numerous research groups and endowed with a total of up to EUR 30 million each – and secondly the "networks of excellence", which also received significant financial support.

FP7 (2007-2013)

The seventh Framework Programme introduced a number of changes (cf. Section 4.2). For the first time, it covered a seven-year period and was linked to the Financial Perspective and thus to the EU's overall budget planning. The budget was set at EUR 50.8 billion (excluding Euratom and ITER), which – after factoring in the new duration – was equivalent to an increase of 51.1% compared to the previous programme. This reflects the higher priority given to research by the EU, as affirmed in the Lisbon Strategy. In terms of content, the importance of the thematic programmes was slightly downgraded. In turn, fundamental research was significantly promoted with the establishment of the European Research Council (ERC). Furthermore, fusion research was strengthened with a view to the construction of ITER.

In terms of instruments, FP7 was shaped by the EC's expressly stated wish to combine the research activities of the Member States, the associated countries and the private sector in a single European Research Area. This was to be achieved firstly through coordination by the public institutions of the Member States in projects such as ERA-NET and ERA-NET+ (networks of the European Research Area), through the matching of national funding programmes to establish a lasting transnational programme for the funding of research and development projects and through Joint Programming Initiatives (JPIs). The purpose of the latter is to implement research programmes focusing on the biggest challenges facing European society, coordinated at European level (the areas of science and technology are defined very broadly). Secondly, new instruments were also created in cooperation with the private sector. For example, some of the European Technology Platforms (ETP) were restructured as Joint Technology Initiatives (JTI). This enabled the Commission to establish public-private partnerships involving industry, researchers and public actors from the Member States and associated countries.

FP8 or Horizon 2020 (2014–2020)

The advent of Horizon 2020 saw a further decline in the budget share of the thematic programmes from 59% under FP7 to 53% (cf. Section 5.2). The main beneficiaries are fundamental research (ERC, from 13.7% to 17% of the total budget) and the new "Access to Risk Finance" programme (3.7%). Another point to be mentioned is the integration of the European Institute of Innovation and Technology (EIT). Based in Budapest (Hungary), the EIT enables the launch of Knowledge and Innovation Communities (KICs), designed to boost Europe's innovative capacity by strengthening cooperation between research institutes, universities and industry. In general, Horizon 2020 attaches greater importance to innovation. Another new feature is facilitated access to risk finance or loans with more or less secure rates of interest for innovative companies. The aim is to help put them in a better financial position to bridge the gap, in terms of time and cost, between research results and their commercialisation.

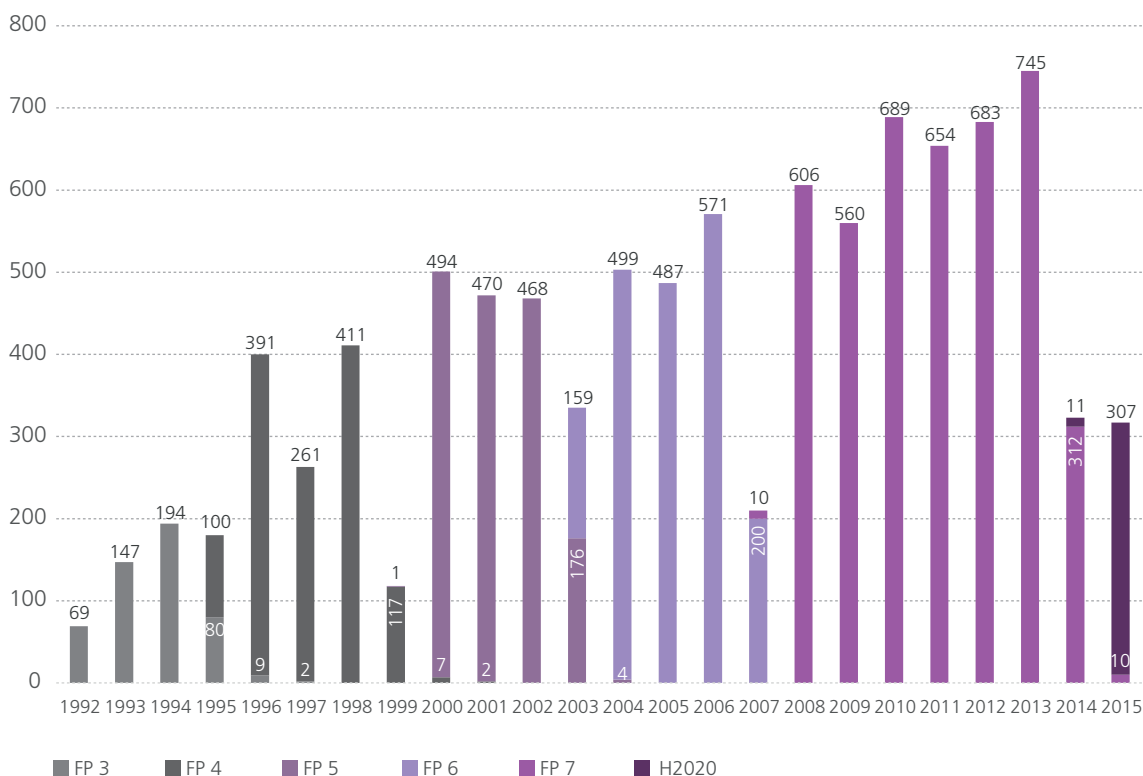
In some cases, Horizon 2020 includes replacements for the instruments of the integrated projects and networks of excellence discontinued during the course of FP7. Toward the end of FP7, the EC launched two large-scale pilot projects, known as flagship initiatives for Future and Emerging Technologies (FET flagships), which were officially added to the programme in Horizon 2020. The FET flagships receive EC funding amounting to half a billion Swiss francs each for ten years, which participants are required to double (these resources can come from Member States, associated countries, or the private sector). The EC can also participate in the public-public partnership initiatives (P2P) of several Member States. The JPIs are also continuing.

3 Development of Swiss participation in the FPs

3.1 Swiss participation in the FPs 1992–2015

The average number of Swiss participations in European research projects has steadily increased since 1992. This trend went hand in hand with the growing FP budgets. The number of project participations is always significantly lower in the first year of an FP than in subsequent years. This is due to a certain time lag between the publication of the first project calls for proposals under a framework programme and the approval or the actual launch of the first projects.

Figure 5: New Swiss participations in European FPs per year, 1992–2020



Sources: European Commission, SERI, cf. Table 3

Since FP3, the number of Swiss project participations has increased steadily and now totals 9906. To date, there have been 4269 Swiss participations in European research projects under FP7.

Under Horizon 2020, Switzerland counts 318 participations so far. This figure can be expected to rise as the data available at the time of writing was extracted on 15 July 2015. This means that not all Swiss participations in Horizon 2020 are yet included. Another reason is that research projects are only entered in the database once the grant agreement has been signed and thus only approximately eight months after their evaluation by the EC. Hence, the current data on participants in Horizon 2020 must be interpreted and analysed with caution as the data currently available are not sufficiently robust.

Nevertheless, the results indicate that the situation in Switzerland following the adoption of the "mass immigration" initiative in 2014 and the subsequent suspension of the negotiations over Switzerland's full association to Horizon 2020 has created a great deal of uncertainty among Swiss researchers. The temporary solution involving the partial association to Horizon 2020 until the end of 2016 and the transitional measures adopted by the Federal Council could not entirely dissolve this uncertainty, as regular contacts between SERI and researchers suggest. The confusion among Swiss researchers and their EU partners, along with Switzerland's exclusion from two pillars of Horizon 2020, is having a negative impact on the number of Swiss participations in Horizon 2020.

3.2 Breakdown of FP contributions by type of institution

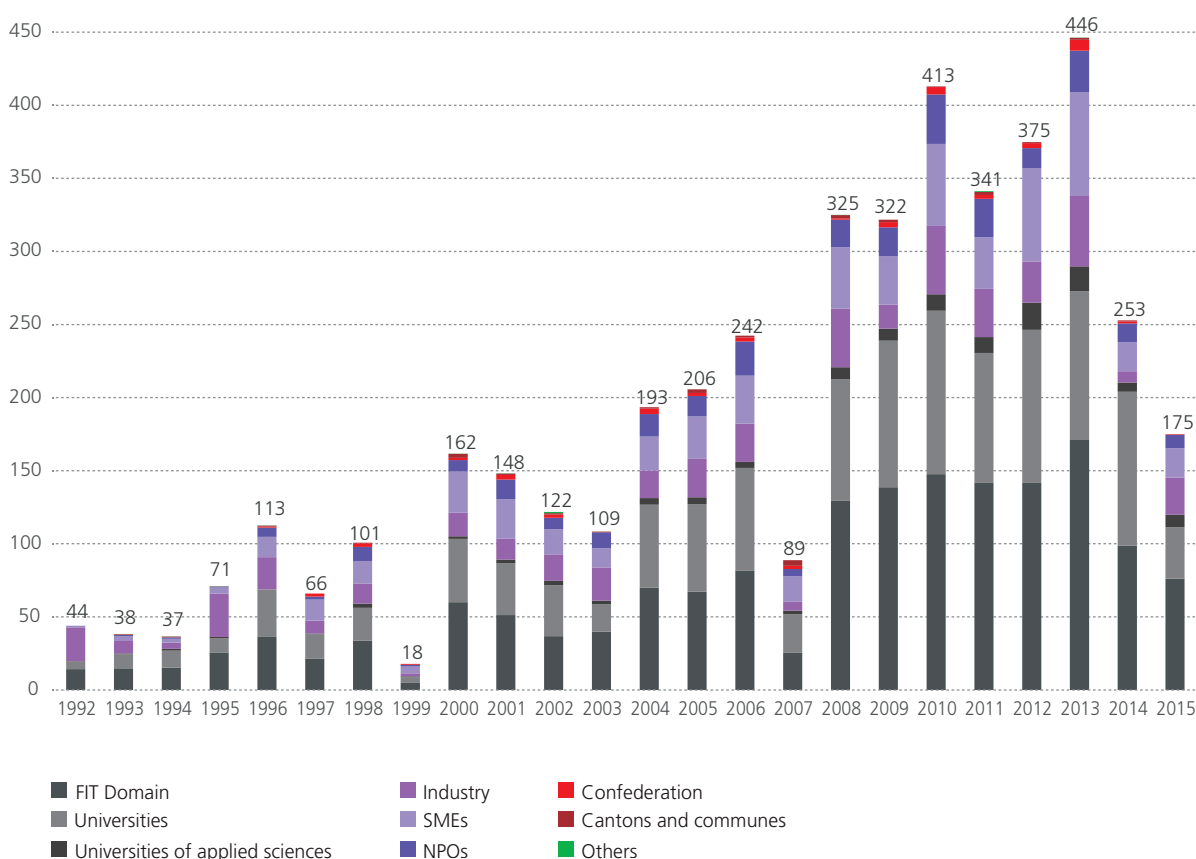
The following chart shows the annual amount of contributions committed to Swiss participants in European research programmes and their breakdown by type of institution. The proportionate participation of the different types of Swiss research institutions has remained remarkably stable over the past ten years. Exceptions are the years 1992 and 1995, when the participation of big industry was exceptionally high and that of the universities was very low. This was partly due to the small number of project participations and partly to the exceptionally large financial participation of two big companies.

Over the whole period from 1992 to 2015, the universities and the ETH Domain received about two thirds of all contributions. Institutions of the ETH Domain accounted for more than half of this share (58% of contributions to cantonal universities and ETH Domain or 37% of contributions to all Swiss participants). Since FP5 at the latest, the ETH Domain has played a key role among Swiss participants. The cantonal universities accounted for an average of approximately 27% of all contributions over this period.

The shares of contributions by small and medium-sized enterprises (SMEs) and industry varied widely, averaging 11% for industry and 13% for SMEs. In FP7 the official target was a total financial share of 15% for SMEs, and in Horizon 2020 this target has increased to 20%. It can therefore be assumed that the effective average share of SMEs will also continue to grow in the coming years.

Non-profit organisations (NPOs) have long accounted for approximately 6% of annual contributions to Switzerland. Swiss universities of applied sciences still play a very minor role in European research, with an average share of just under 3%.

Figure 6: Contributions to Swiss participants in European research framework programmes by type of institution, 1992-2015 (in CHF m)

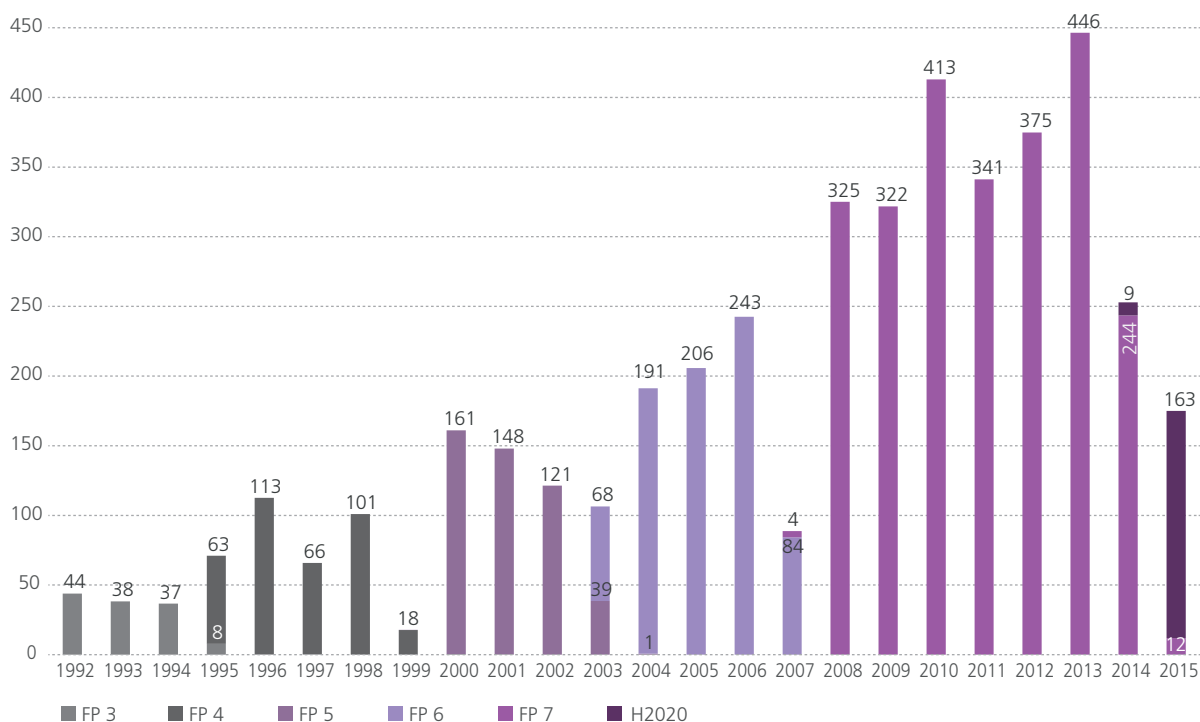


Sources: European Commission, SERI, cf. Table 4

3.3 Funding of Swiss research under the FPs 1992–2015

During the period from 1992 to 2015, European projects undertaken in Switzerland received financial support totalling CHF 4401 million, CHF 2482 million in FP7 alone. Since 1992, the annual amounts have increased considerably. Funding received under Horizon 2020 so far comes to CHF 172.4 million.

Figure 7: Contributions committed to Swiss institutions since FP3, 1992–2015 (in CHF m)



NB: The figures for future payments under FP7 and payments under Horizon 2020 are estimates. In the case of FP7, it should be noted that the total amount committed to a project is paid in the form of equal annual instalments. However, in Horizon 2020 payments are made in three instalments: 50% of the total amount at the start of the project, 30% after the first interim evaluation (usually half way through the project) and 20% on completion of the project. Sources: European Commission, SERI, cf. Table 5

As already mentioned, there is always a time lag between the approval of a project and the actual project launch. Apart from these distortions at the beginning of a new programme generation, the contributions committed to Swiss institutions in Figure 7 show a steady increase over the years.

Figure 7 also shows how the "life" of a framework programme extends well beyond its official completion date.

4 Swiss participation in FP7 2007–2013

4.1 Introduction

Despite the fact that FP7 has officially come to an end and Horizon 2020 has already begun, it is not possible to put a final financial figure on Switzerland's participation in the programme yet. Some projects are still in progress and the actual contributions of Switzerland to FP7 will not be definitely known until July 2017. According to the agreement on Switzerland's association to FP7, the EU may require an upward or downward adjustment of the contributions paid for up to four years after the end of the programme.

A provisional overview of the contributions committed to Swiss institutions can already be presented, however, along with a final balance sheet of the non-financial aspects of Switzerland's participation. The most recent data at the time of writing (from 6 October 2014) shows that a total of EUR 44.9 billion was used to finance European research projects. This corresponds to 87% of the EUR 51.7 billion which the EC originally budgeted for FP7.³ The remaining approximately 13% consist of funds yet to be committed for projects launched at the end of 2014 or later, amounts for various programmes and initiatives not included in the EC's published data and costs associated with the administration of FP7. These funds enabled the financing of 25,237 research projects, which resulted in a total of 133,615 project participations in FP7. Swiss research institutions were responsible for the coordination of 972 projects. There were a total of 4269 participations from Switzerland, which were supported with a total contribution of CHF 2482.1 million by the European Commission.

4.2 Structure of FP7

FP7 consisted of five specific programmes:

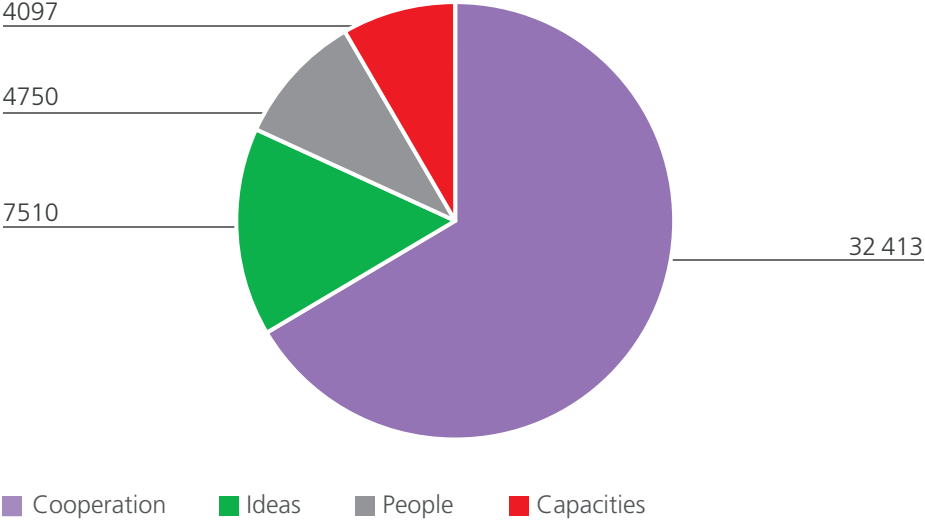
1. **Cooperation (budget: EUR 32.4 billion or 64% of the total FP7 budget)** – Support for cooperation between industry and academia with the aim of strengthening Europe's leading position in key areas of research. This programme supports transnational research cooperation, cooperation projects and networks and the coordination of national research projects addressing current social, economic, environmental and industrial challenges. It includes a component relating to international cooperation between the EU and third countries, as well as one relating to the Joint Technology Initiatives (JTI).
2. **Ideas (EUR 7.5 billion or 15%)** – Support for exploratory and innovative fundamental research. This programme is intended to strengthen the dynamism, creativity and excellence of European research at the frontiers of all areas of science and technology. The European Research Council (ERC) is implementing this programme and is funding initiatives proposed by researchers themselves on the basis of a bottom-up model.
3. **People (EUR 4.8 billion or 9%)** – Support for researcher mobility and career development in Europe and worldwide (Marie-Curie Actions MCA, now MSCA).
4. **Capacities (EUR 4.1 billion or 8%)** – Support for the establishment of the knowledge capacities that Europe needs if it is to become a thriving knowledge-based economy. The objectives of this programme are to support research infrastructures, research for small and medium-sized enterprises (SMEs) and the research potential of the European regions (Regions of Knowledge), as well as to exploit the full research potential of the enlarged Union (convergence regions).
5. **Activities of the Joint Research Centre outside the nuclear sector (EUR 1.8 billion or 3%)** – The Joint Research Centre is the interface between technological research and its practical applications. It is intended to provide scientific and technical support for EU policymaking.

³ This includes the funding for the fission component of Euratom and the nuclear area of the European Commission's Joint Research Centre (JRC).

The specific programme "Cooperation" – the core of FP7 – comprises ten priority research areas (cf. Figure 9 and Table 6): health; food, agriculture and fisheries, and biotechnology; information and communication technologies (ICT); nanosciences, nanotechnologies, materials and new production technologies; energy; environment (including climate change); transport (including aeronautics); socio-economic sciences and the humanities; space; security. From a budgetary perspective, two priorities stand out: ICT (28%) and health (19%). In addition, the Commission wishes to ensure that at least 15% of the Cooperation programme's contributions benefit SMEs.⁴ According to the seventh FP7 monitoring report, this goal was achieved. The report shows that SMEs account for 19% of participations and receive 15% of the total budget.⁵

The "Capacities" programme is also divided into various research priorities (cf. Figure 10 and Table 6). The bulk of the budget is devoted to support for research infrastructures (42%) and research for SMEs (33%).

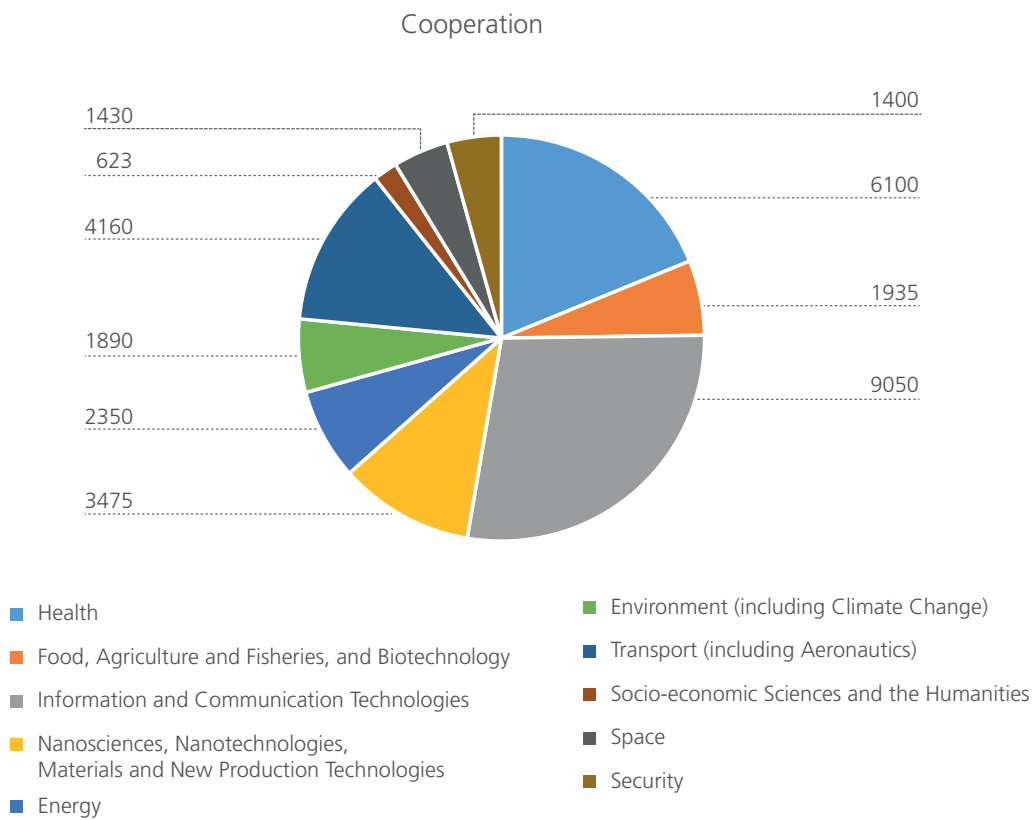
Figure 8: Breakdown of the FP7 budget by programmes (in EUR m)



Sources: European Commission, SERI, cf. Table 6

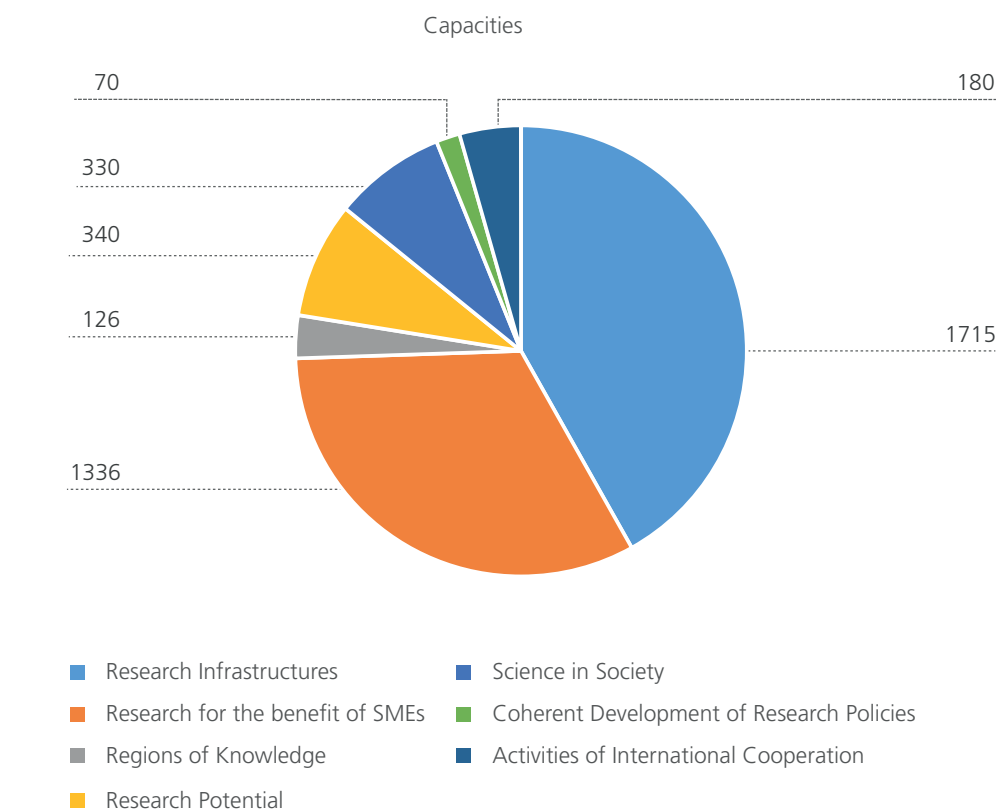
⁴ Decision 2006/971/EC of the Council of the European Union.
⁵ European Commission, 2015, Seventh FP7 Monitoring Report – MONITORING REPORT 2013. (http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports/7th_fp7_monitoring_report.pdf, p.77).

Figure 9: Breakdown of the budget for the FP7 "Cooperation" programme (in EUR m)



Sources: European Commission, SERI, cf. Table 6

Figure 10: Breakdown of the budget for the specific "Capacities" programme in FP7 (in EUR m)



Sources: European Commission, SERI, cf. Table 6

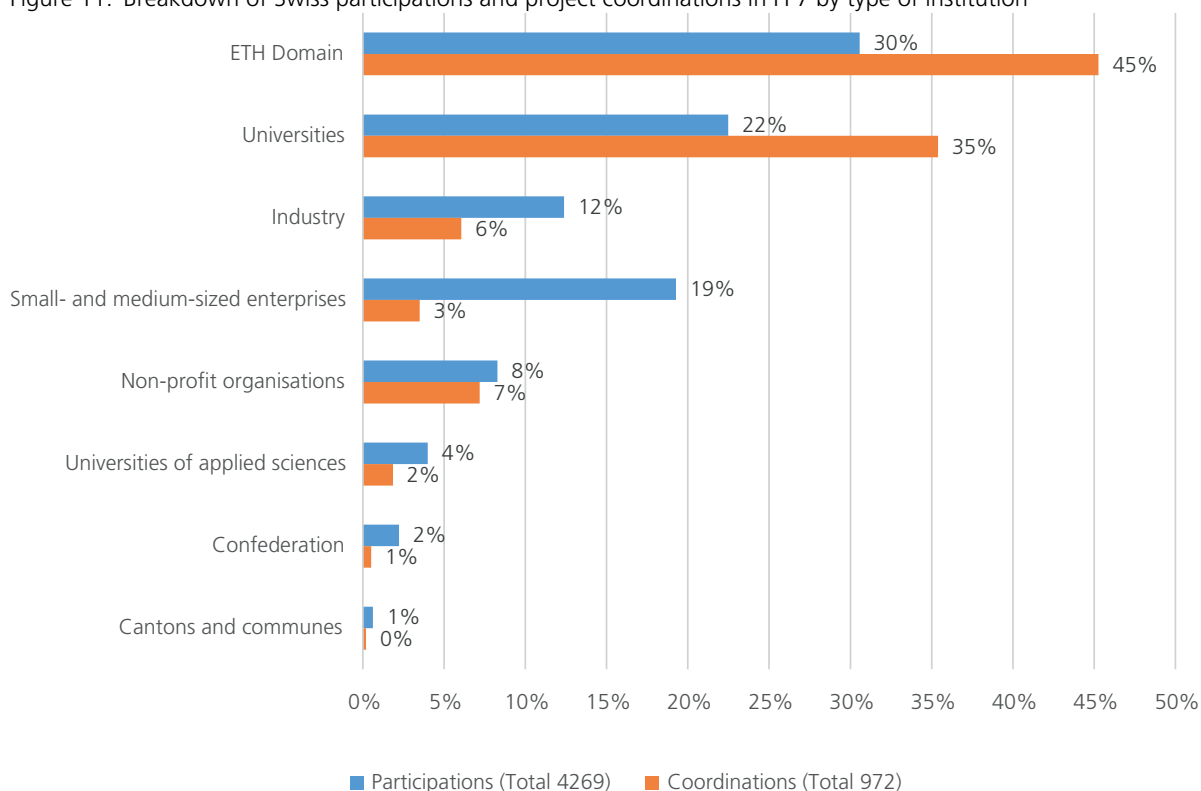
4.3 Breakdown of Swiss participations by type of institution

4.3.1 Project participations and project coordinations by type of institution

The ETH Domain accounted for a total of 1305 (30.6%) of all Swiss participations in European projects under FP7 (cf. Table 7 in the Appendix). The concerned institutions received 39.2% of all contributions allocated to Swiss research institutions for their projects. 21.9% of the contributions went to companies, which accounted for 1352 participations (31.7%). This discrepancy between the proportions of participations from the two categories of participants and their shares of contributions is explained by the fact that the companies received an average of just CHF 402,174 per participation, whereas the institutions of the ETH Domain were awarded an average of CHF 746,012. The universities secured an average of CHF 724,277 per participation. With 960 participations, they account for 22.5% of Swiss participations in FP7.

In each FP cooperation project, one partner assumes the task of coordination. This task, which is often assigned to the initiator of the project proposal, covers the general management of the project, as well as the selection of the project partners. The function of project coordination has only been open to Swiss researchers since Switzerland's association with the FPs in 2004. If project coordinations and project participations are considered separately, the central role of the ETH Domain and the universities emerges even more clearly, with the ETH Domain accounting for 30.6% of Swiss participations but 45.3% of Swiss coordinators. The universities also played a key role, supplying 35.4% of all Swiss coordinators. Hence, the overall percentage of coordinators from academia amounts to 80.7%. For companies (regardless of size) the picture was reversed, with 31.7% of participants and a mere 9.6% of coordinators drawn from their ranks. Non-profit organisations from Switzerland were in charge of 7.2% of project coordinations, which is roughly in line with their participation in FP7 (8.3%).

Figure 11: Breakdown of Swiss participations and project coordinations in FP7 by type of institution



Sources: European Commission, SERI, cf. Table 7

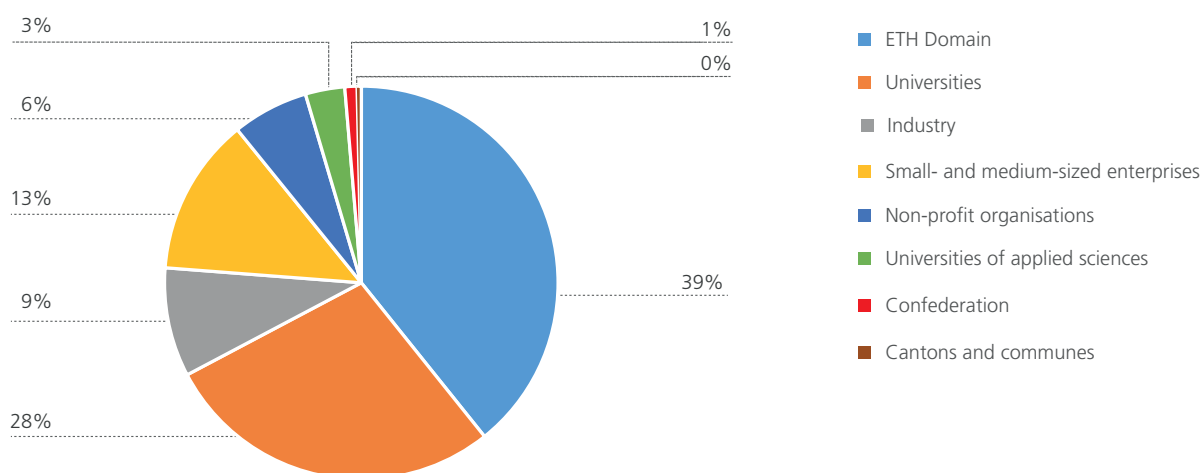
4.3.2 Contributions by type of institution

As stated above, the majority of Swiss participations in FP7 came from the ETH Domain and the universities. These were also the main beneficiaries of FP7, securing contributions of CHF 973.5 million (39.2%) and CHF 695.3 million (28.0%), respectively, out of the CHF 2482.1 million committed to all Swiss participants. The share of contributions received by institutions of the ETH Domain was significantly higher in FP7 than in FP6 (34.1%), while the universities saw their share remain virtually unchanged (27.6%; cf. Table 7 for details of the breakdown).

More than one fifth of the contributions for Swiss institutions (CHF 543.7 million or 21.9%) went to companies, with SMEs accounting for 12.9% or CHF 321.3 million. In FP6, 25.5% of all contributions to Switzerland were awarded to companies (CHF 202.4 million in absolute terms). This means that companies saw their share decline compared with FP6. However, it should be noted that the performance of Swiss SMEs in the specific programme "Cooperation" was outstanding. While the European Commission's stated objective for FP7 was to allocate at least 15% of contributions under this programme to SMEs, Swiss SMEs were able to secure 20.5% of contributions committed to Swiss participants (CHF 270.9 million). This means that they exceeded the European target and proved more competitive than their European counterparts, who received an average of 14.6% of the budget in the "Cooperation" programme.⁶ The active participation of Swiss SMEs is a new development; in previous research framework programmes, they ranked below the European average.

Swiss universities of applied sciences received some CHF 80.5 million, or 3.2% of contributions to Swiss institutions. Other beneficiaries of European contributions were non-profit organisations and Swiss public institutions, which together obtained CHF 188.0 million, or the remaining 7.6%.

Figure 12: Breakdown of EU contributions committed to Swiss institutions under FP7 by type of institution



Sources: European Commission, SERI, cf. Table 7

⁶ European Commission, 2015, Seventh FP7 Monitoring Report – MONITORING REPORT 2013. (http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports/7th_fp7_monitoring_report.pdf, S.77).

4.4 Analysis by research area

4.4.1 Number of participations by research area

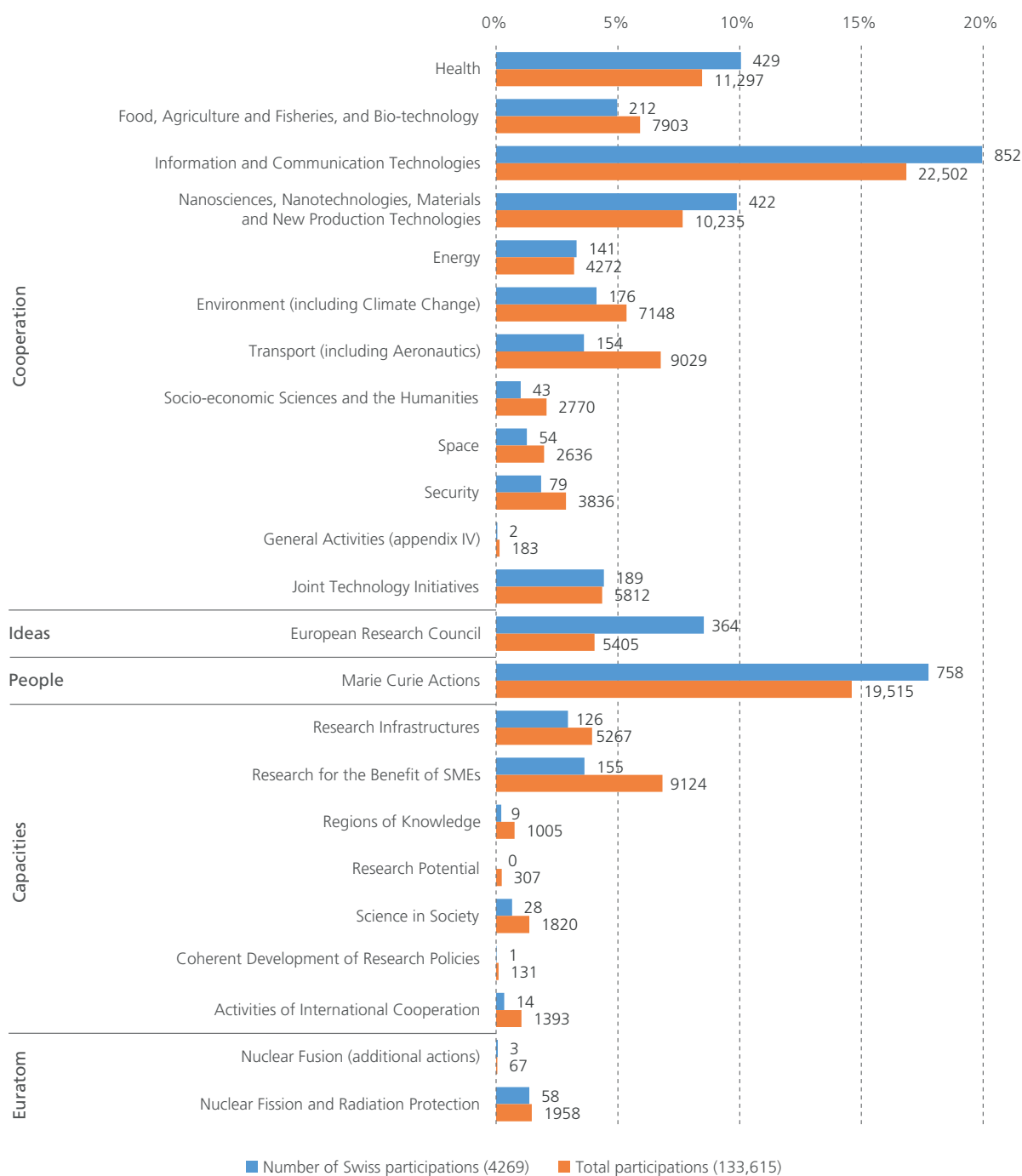
An analysis of the 4269 Swiss participations in research projects under FP7 shows that Swiss institutions are primarily involved in the following research priorities or programmes: ICT (852 participations or 20.0% of all Swiss participations); the specific programme "People" with the Marie Curie Actions (MCA, now MSCA) (758 / 17.8%); health (429 / 10.0%), and nanosciences, nanotechnologies and new Production technologies (NMP) (422 / 9.9%).

In European comparison, Switzerland exhibits a higher-than-average participation in the specific programmes "Ideas" (European Research Council, ERC) and "People" (Marie Curie Actions, MCA), as well as in the areas of ICT, NMP and Health (cf. also Section 4.3.3). However, Switzerland is comparatively underrepresented in the "Capacities" programme, particularly in the thematic areas "Research for SMEs", "Regions of Knowledge" and "Science in Society" as well as in the areas of transport, environment and social sciences and humanities.

Some projects or calls for proposals are not managed directly by the European Commission but by other organisations.⁷ Where this is the case, the relevant contributions are paid in the first instance to the organisation in charge and forwarded by the latter to the researchers involved. In such cases, the European Commission database does not contain any data on the final beneficiaries or the size of the contributions they receive. The actual number of projects funded in Switzerland is therefore greater than shown here. This discrepancy is particularly marked in the area of space, in which a large proportion of the projects are co-funded by FP7 but monitored by the European Space Agency (ESA). Projects supported under Article 185 of the Treaty on the Functioning of the European Union (TFEU) do not appear in the data supplied by the EU either. Swiss projects within the framework of Articles 185 and 187 of the TFEU are discussed in a separate section (see Section 6). Finally, projects in the field of nuclear fusion consist exclusively of activities for better networking and coordination of European research in nuclear fusion. The concrete research projects in this area form part of the Euratom programme, which comes under a separate European treaty and is subject to other funding rules (see Section 7).

⁷ This particularly applies to some Integrated Projects (IP), ERA-NET Plus, Joint Technology Initiatives (JTIs or initiatives under Article 187 TFEU) and their Joint Undertakings (JU), as well as to initiatives under Article 185 TFEU. This also applies to the Global Monitoring for Environment and Security programme (GMES), which is led jointly by the European Commission and ESA.

Figure 13: FP7 participations by specific programme and research priority (the sum of the Swiss participations and the totals equal 100%)



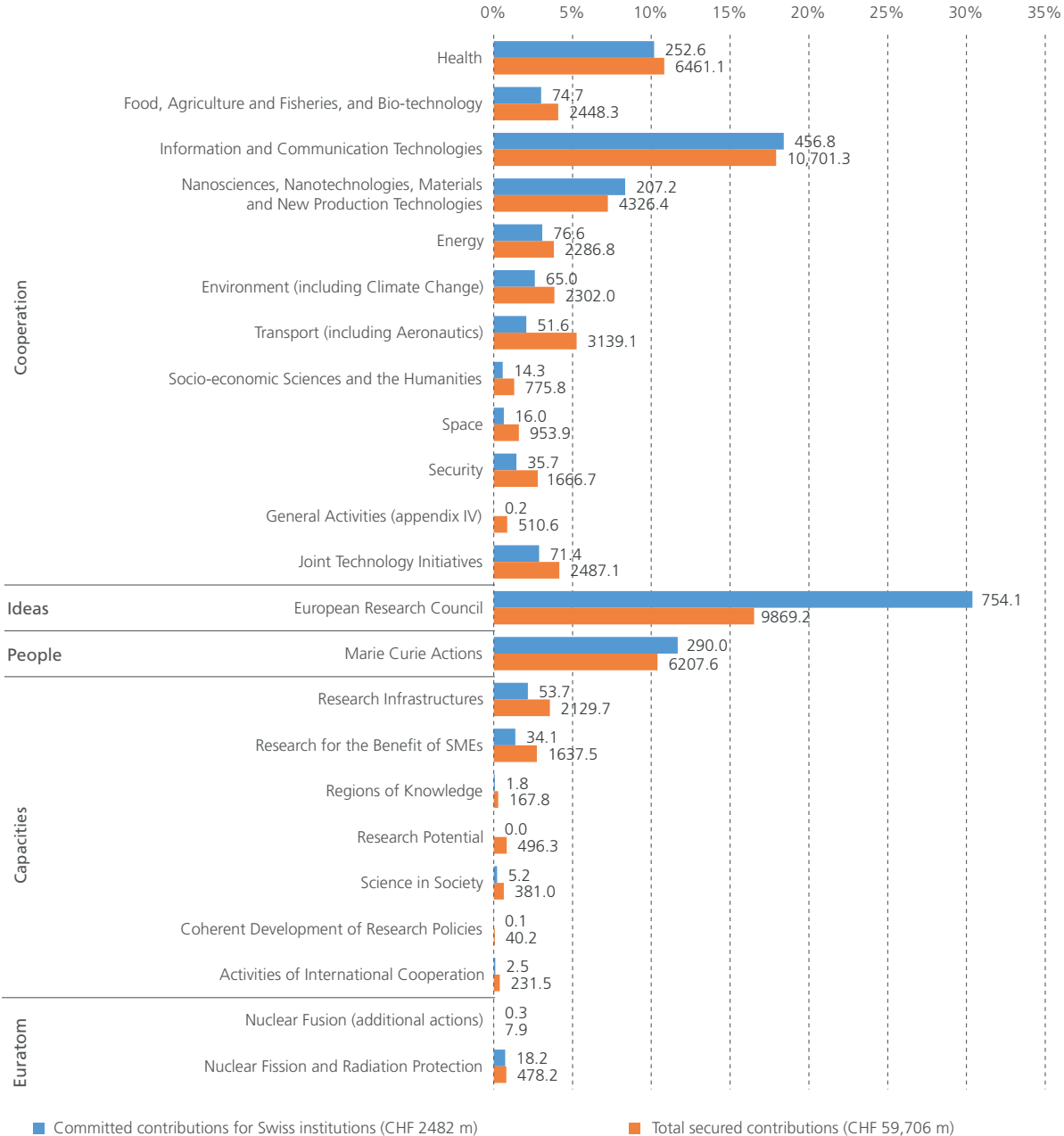
Sources: European Commission, SERI, cf. Table 8

4.4.2 Contributions by research area

In total, Swiss institutions secured contributions of around CHF 2482.1 million in the framework of FP7. The research areas and instruments that received by far the most support are essentially those in which Switzerland had a large number of participations (cf. previous section). ERC grants accounted for CHF 754.1 million or 30.4% of all contributions committed to Swiss institutions. These were followed by ICT (CHF 456.8 million, 18.4%), the Marie Curie Actions (CHF 290.0 million, 11.7%) and health (CHF 252.6 million, 10.2%).

Parallels between the number of participations and the scale of contributions per research area can only be found to a limited degree, however, as the size of contributions awarded vary very widely depending on the research area. The average funding volume per Swiss participation under FP7 stands at around CHF 581,412 for all research areas. The area "Research for SMEs" is characterised by particularly low contributions per participation, averaging CHF 220,077. By contrast, the average grant awarded to Swiss participants under the "Ideas" programme (ERC) came to a substantial CHF 2.1 million. This is well above the Europe-wide average of CHF 1.8 million per grant under this programme. Contributions for Swiss researchers under the "People" programme (MCA) amounted to an average of CHF 382,585, as compared to a European average of CHF 318,063. The relatively high contributions received by Swiss research institutions are essentially explained by the particularly high costs associated with cutting-edge research in Switzerland.

Figure 14: Contributions under FP7 by specific programme and research priority (in CHF m)



Sources: European Commission, SERI, cf. Table 8

4.4.3 Intensity and quality of Swiss participations by research area⁸

European contributions are awarded on a competitive basis. Each project proposal is evaluated by a committee of experts and evaluated in comparison with the other applications. Only the best proposals are awarded grants. The success rate is indicative of the number of proposals approved as a proportion of all the proposals evaluated.⁹ A country's success rate therefore depends essentially on the quality of its institutions' submissions. However, general success rates differ greatly according to the programme and area concerned. They depend primarily on the ratio between the budget of that programme or area, the total number of submissions and the average amount of funding per selected project. Thus, while some areas have significant budgets, they are only open to a restricted circle of potential beneficiaries, which limits the number of submissions. By contrast, other areas have large numbers of potential beneficiaries, but limited budgets.

A study of Swiss project proposals under FP7 gives an impression of the quantity (intensity of participation) and quality of the applications submitted in the individual research areas. For each research area these two parameters are expressed by a participation index and a success index for Swiss proposals.

To determine the participation index, the proportion of Swiss project proposals in a specific area is compared to the proportion of proposals from all countries in that area. The more intensive the Swiss participation, the higher the index value. To be more precise, an index value of less than 1 indicates disproportionately low Swiss participation, while a value of 1 indicates equal participation and a value of more than 1 reflects disproportionately high Swiss participation. The success index for Swiss project proposals reflects the ratio of the success rate for Swiss proposals to the success rate for proposals from all countries in a given area. The index value behaves in much the same way as the participation index: The higher the success rate for Swiss project proposals in comparison with the general success rate, the higher the index value. A value of 1 signifies an equal success rate.

The graphic representation of the participation and success indices for the individual programmes and research priorities of FP7 (Figure 15) shows that the success rate for Swiss project proposals is higher than the European total (represented by the horizontal straight line at the value of 1) in most areas. It also clearly illustrates Switzerland's excellent ranking in the "Ideas" programme (ERC).

Furthermore, it is noteworthy that very few research areas are located in the lower right quadrant of the chart. This suggests that high participation in a specific research area is usually associated with a high success rate.

Finally, the areas in the upper left quadrant of the chart have a good success rate, but relatively low participation. This points to as yet undeveloped funding potential for Swiss institutions in the areas of environment, food, agriculture and fisheries, biotechnology, energy, transport, security, aerospace and research for the benefit of SMEs.

⁸ These analyses are based on a different database than the one used in the other sections of the report (database of project proposals for FP7, data supplied by the European Commission on 6 October 2014). The figures on numbers of participations given in Table 9, in particular (see Appendix), therefore differ from those indicated in other parts of the report. The latter are based on the database of contracts.

⁹ In other words, submissions which are withdrawn by the applicant or which are not approved for evaluation on formal grounds are not included in the calculation of the success rate. The same applies to duplicate submissions or submissions that are ultimately assigned to a different area.

Figure 15: Participation and success index for Swiss project proposals under FP7 by specific programme and re- search priority



Sources: European Commission, SERI, cf. Table 9

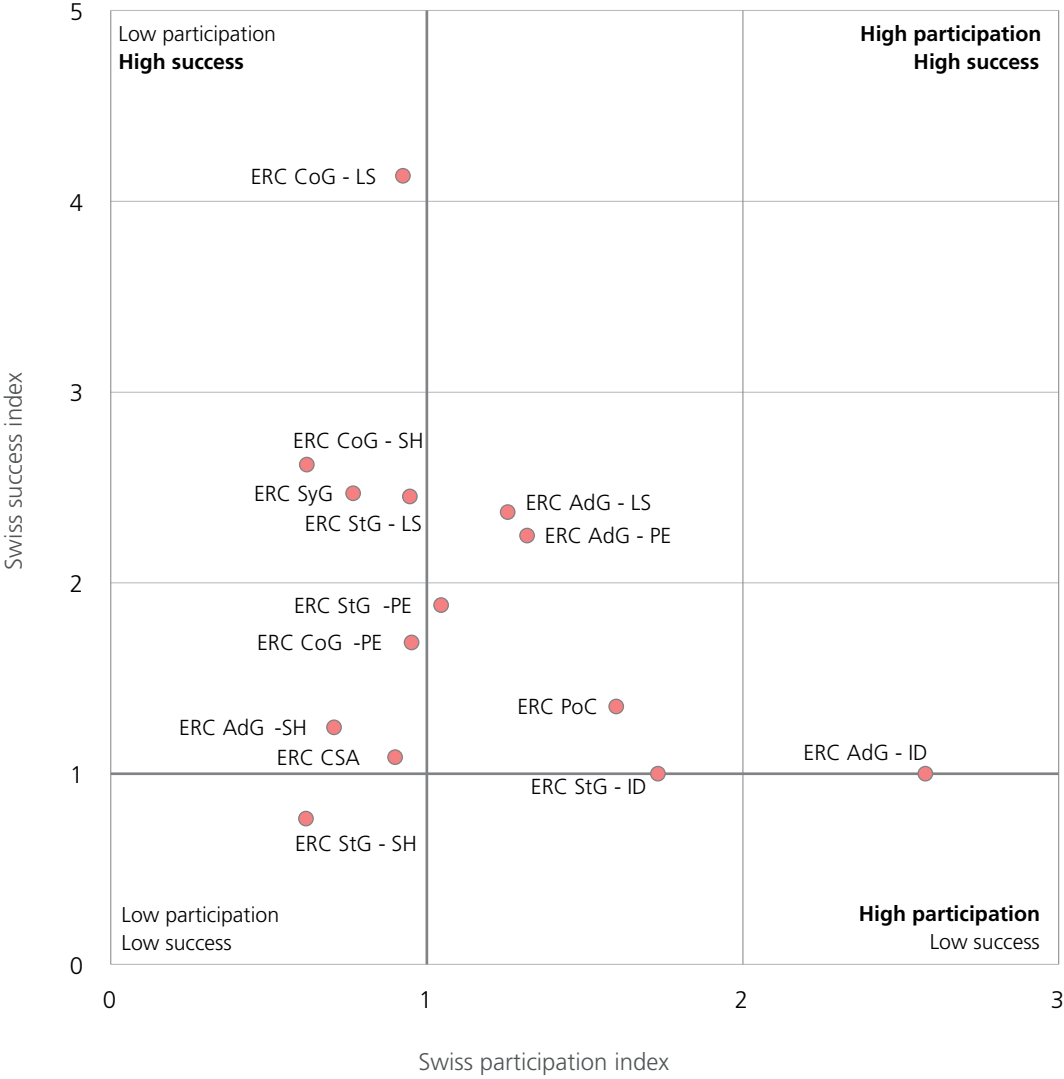
Legend 1: Meaning of abbreviations

Abbreviation	Programme / research priority	Abbreviation	Programme / research priority
COH	Coherent Development of Research Policies	NMP	Nanosciences, Nanotechnologies and New Production Technologies
ENERGY	Energy	PEOPLE	Marie Curie Actions
ENV	Environment (including Climate Change)	REGPOT	Research Potential
ERC	European Research Council	REGIONS	Regions of Knowledge
Fission	Nuclear Fission and Radiation Protection	SEC	Security
Fusion	Nuclear Fusion	SiS	Science in Society
GA	General Activities	SME	Research for the Benefit of SMEs
HEALTH	Health	SP1-JTI	Joint Technology Initiatives
ICT	Information and Communication Technologies	SPA	Space
INCO	Activities in the Field of International Cooperation	SSH	Socio-economic Sciences and the Humanities
INFRA	Research Infrastructures	TPT	Transport (including Aeronautics)
KBBE	Food, Agriculture and Fisheries, and Biotechnology		

Sources: European Commission, SERI, cf. Table 8

The "Ideas" programme (ERC) funds projects in fundamental research in a wide range of areas. Researchers are free to choose the area. An analysis of the participation and success indices within this programme (Figure 16) shows that Swiss project proposals exhibit a good or very good quality in almost all ERC domains, even though the participation index is disproportionately low in most areas. In thematic terms, Swiss research particularly excels in the life sciences, where the success rate of Swiss submissions is up to four times higher than the European total. Thus, the rate is 27.6% for grants for young researchers (Starting Grants, StG), 35.9% for researchers who are becoming established (Consolidator Grants, CoG) and 29.1% for advanced researchers (Advanced Grants, AdG) (cf. Table 10 in the Appendix). Proposals in engineering and physics also show very good results, with success rates of 22.1% for Starting Grants, 12.5% for Consolidator Grants and 27.6% for Advanced Grants. These figures are nearly twice as high as the overall value for all countries. In the Social Sciences and Humanities Domain, where Swiss participation is below the European reference value, the results are more nuanced. While applications for Consolidator and Advanced Grants did well, with success rates of 16.7% and 13.3% respectively, the success rate for young researchers is at only 7.1% and below the European reference value. In the little-used interdisciplinary area (129 submissions in total), Switzerland's success index is on a par with the European level, but the number of participations is comparatively high. In the interdisciplinary area too, Swiss applications for grants for advanced researchers are significantly more numerous than for grants for young researchers, while their success rate is approximately the same. The newly introduced "proof-of-concept" funding system aims to strengthen the innovative potential of previous ERC projects and is therefore focused exclusively on researchers who have already received an ERC grant in the past. Here, Swiss researchers are characterised by fairly high participation and a success rate of around 45.2%, which is above the European reference value. However, the funding amounts are low compared to the other ERC grants, amounting to less than EUR 150,000. Another category which should be mentioned are the "Synergy Grants", where, at 5.6%, the Swiss success rate is the lowest across all instruments, but still remains well above the success rate of all countries combined (2.3%). Calls to apply for synergy grants were only launched in 2012 and 2013. These grants awarded large sums for new fundamental research at the frontiers of knowledge, enabling networking of researchers from a variety of locations and/or disciplines.

Figure 16: Participation and success index of Swiss project proposals submitted to the European Research Council (ERC) under FP7, by discipline



Sources: European Commission, SERI, cf. Table 10

Legend 2: Key to abbreviations for ERC grants by discipline

Abbreviation	Type of grant
ERC StG-LS	ERC Starting Grant Life Sciences Domain
ERC StG-PE	ERC Starting Grant Physical Sciences and Engineering Domain
ERC StG-SH	ERC Starting Grant Social Sciences and Humanities Domain
ERC StG-ID	ERC Starting Grant Interdisciplinary Domain
ERC CoG-LS	ERC Consolidator Grant Life Sciences Domain
ERC CoG-PE	ERC Consolidator Grant Physical Sciences and Engineering Domain
ERC CoG-SH	ERC Consolidator Grant Social Sciences and Humanities Domain
ERC AdG-LS	ERC Advanced Grant Life Sciences Domain
ERC AdG-PE	ERC Advanced Grant Physical Sciences and Engineering Domain
ERC AdG-SH	ERC Advanced Grant Social Sciences and Humanities Domain
ERC AdG-ID	ERC Advanced Grant Interdisciplinary Domain
ERC SyG	ERC Synergy Grant
ERC PoC	ERC Proof of Concept
ERC CSA	ERC Other and Support Actions

Sources: European Commission, SERI, cf. Table 10

The results discussed above confirm the excellent performance of researchers in Switzerland in comparison with Europe as a whole, since the only criterion for awarding ERC grants is the scientific quality of the project proposals. With 364 funded projects, the Swiss success rate with the ERC stands at 23.8% overall, as compared to a European success rate of 11.1%. According to an EC study, this puts Switzerland in pole position, ahead of all other countries.¹⁰

It should be borne in mind here that it is the geographical location of an institution that determines which country a project is attributed to, rather than the nationality of the person submitting the application or where he or she was educated. If we confine our view to researchers of Swiss nationality, the number of ERC proposals funded comes to 110, which corresponds to a success rate of 18.2% and puts Switzerland at the top of success rate rankings based on nationality.¹¹ 84 of these researchers (i.e. 76%) are conducting their projects at Swiss institutions.¹² By contrast, 74% of beneficiaries of ERC grants working at Swiss research institutions are non-Swiss nationals. This tells us that Swiss institutions owe their success with ERC grants on the one hand to the excellence of those candidates who are Swiss nationals, but on the other hand and above all to the attractive environment Switzerland offers, which draws outstanding researchers from abroad to the country.

¹⁰ European Commission, 2015, "ERC funding activities, 2007-2013, Key facts, patterns, and trends".

¹¹ The figures do not include countries for which less than 10 projects were evaluated.

¹² European Commission, 2015, "ERC funding activities, 2007-2013, Key facts, patterns, and trends".

4.5 Analysis based on other criteria

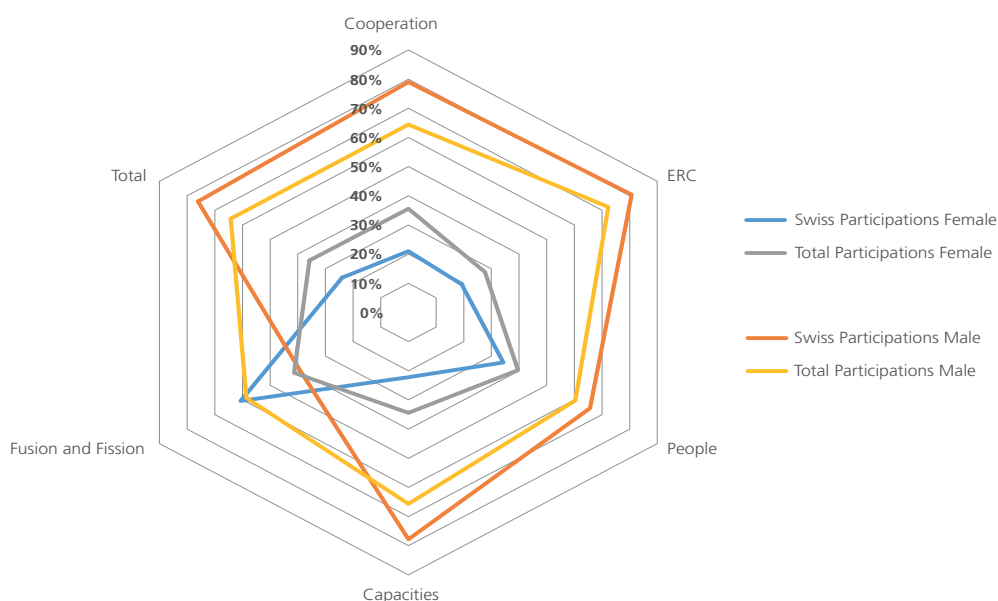
4.5.1 Participation by gender¹³

Just under a quarter (23.9%) of Swiss participants in European projects are women. This percentage is well below the European average (35.7%). Although promoting science careers for women is one of the explicit goals of the European Commission's research policy¹⁴, there is still a long way to go before a balanced participation of men and women is achieved in European research projects. This finding applies not only to the Framework Programmes: in the EU, the proportion of female researchers stands at only 33%, while women hold a mere 20% of ordinary professorships; only 15.5% of universities are headed by a woman.

However, the number of female researchers in all sectors is increasing faster than the number of male researchers. In Switzerland, for example, the period from 2004 to 2008 saw an average annual growth rate of 4.6% for female researchers compared to just 0.3% for male researchers. Nevertheless, it will still take many years before a gender balance is achieved.

In FP7, two programmes differ from the rest in terms of the gender distribution among participants: on the one hand, the ERC grants are characterised by a particularly low proportion of women. In Switzerland, only 19.2% of grantees are female, compared to a European average of 27.7%. On the other hand, women are less underrepresented in the "People" programme (Marie Curie Actions, Researcher Mobility) (European average of 39.7%, 34.3% in Switzerland). In the programme for the benefit of SMEs, only 7.1% of the participants in Switzerland are female, as against 25.4% at European level. By contrast, women are better represented in the area of nuclear fission (63.8% in Switzerland compared to 41.5% in Europe) and in the social sciences and humanities. In the latter area, a respectable 47.6% of Swiss projects are led by women even though the corresponding total share in the EU is still higher with 51.8%.

Figure 17: Proportions of male and female participants in FP7 by programme



Sources: European Commission, SERI, cf. Table 11

NB: The gender of participants in the ICT programme is not currently given in the European Commission's data and is therefore not taken into account here.

¹³ The data presented in this section on Swiss and European institutions outside the FP come from the European Union publication *She figures 2012, Gender in Research and Innovation, Statistics and Indicators (2013)*. Since only the main applicants for each project are known, in this section, the term "Swiss participants" refers to the person who leads the research or development team on the level of the institution participating in the FP7 project. Project staff performing other functions are not considered, owing to a lack of data.

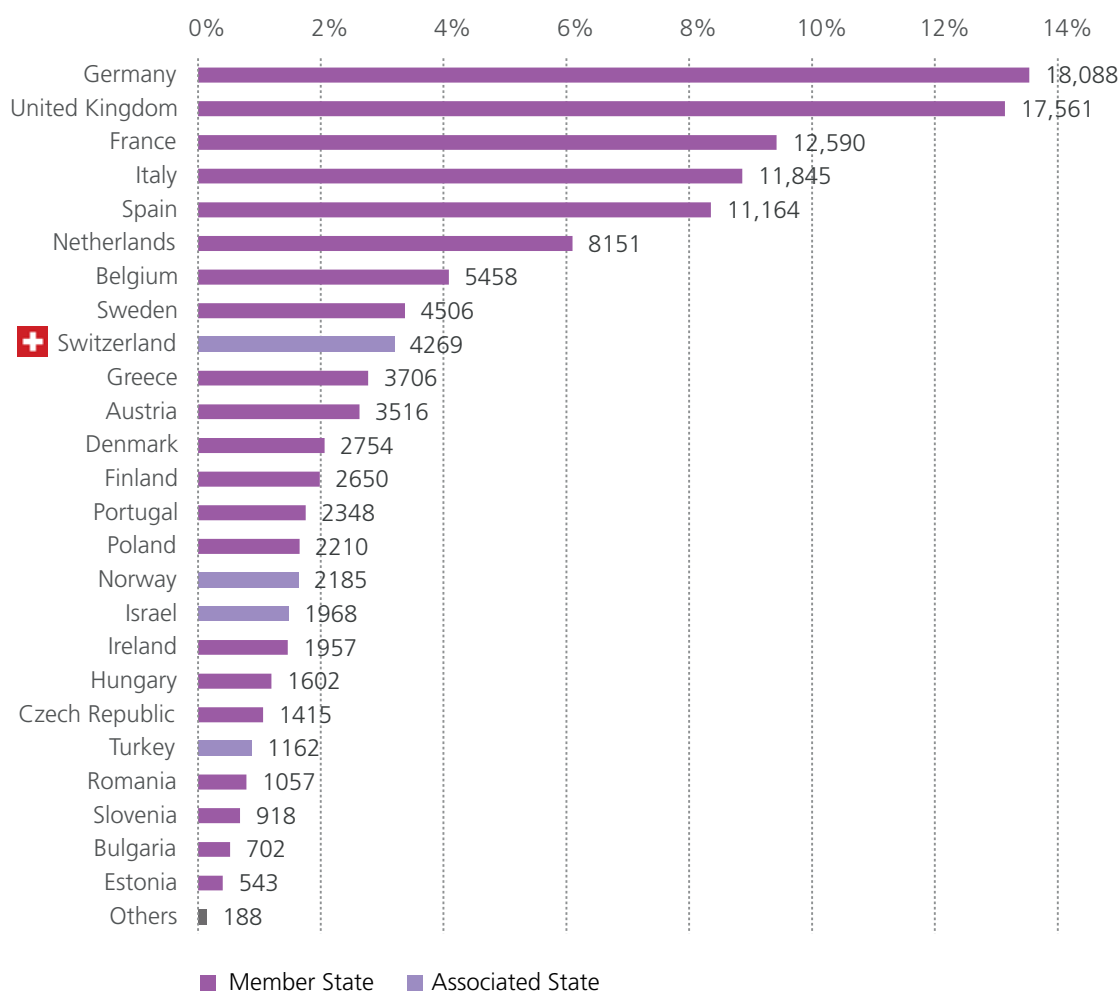
¹⁴ In 1999, the European Commission had set itself the goal of increasing the proportion of female beneficiaries of Marie Curie scholarships to at least 40% (European Commission, 1999, Commission Communication "Women and science: Mobilising women to enrich European research", COM(1999)76, Brussels). This target was subsequently extended to all levels of the implementation and management of research programmes (Council Resolution of 26 June 2001 on science and society and on women in science, 2001/C/199/01).

4.6 Switzerland and Europe compared

4.6.1 Number of participations per country

Switzerland's 4269 participations in FP7 (including coordinations) account for 3.2% of the total of 133,615 participations from all countries. This figure, which is considerably higher than the proportion of Swiss participations in FP6 (2.6%), puts Switzerland in ninth position in a comparison of countries taking part. This leaves it behind the large European countries, as well as the Netherlands, Belgium and Sweden, but ahead of Greece, Austria, Denmark and Finland. Among the associated countries, Switzerland is the country with the highest involvement in FP7. Compared to the last report on Switzerland's participation in FP7 (interim report 2007–2012), its share of participations has remained stable (slight decline from 3.3% to 3.2%).

Figure 18: Breakdown of participations (including coordination) in FP7 by country



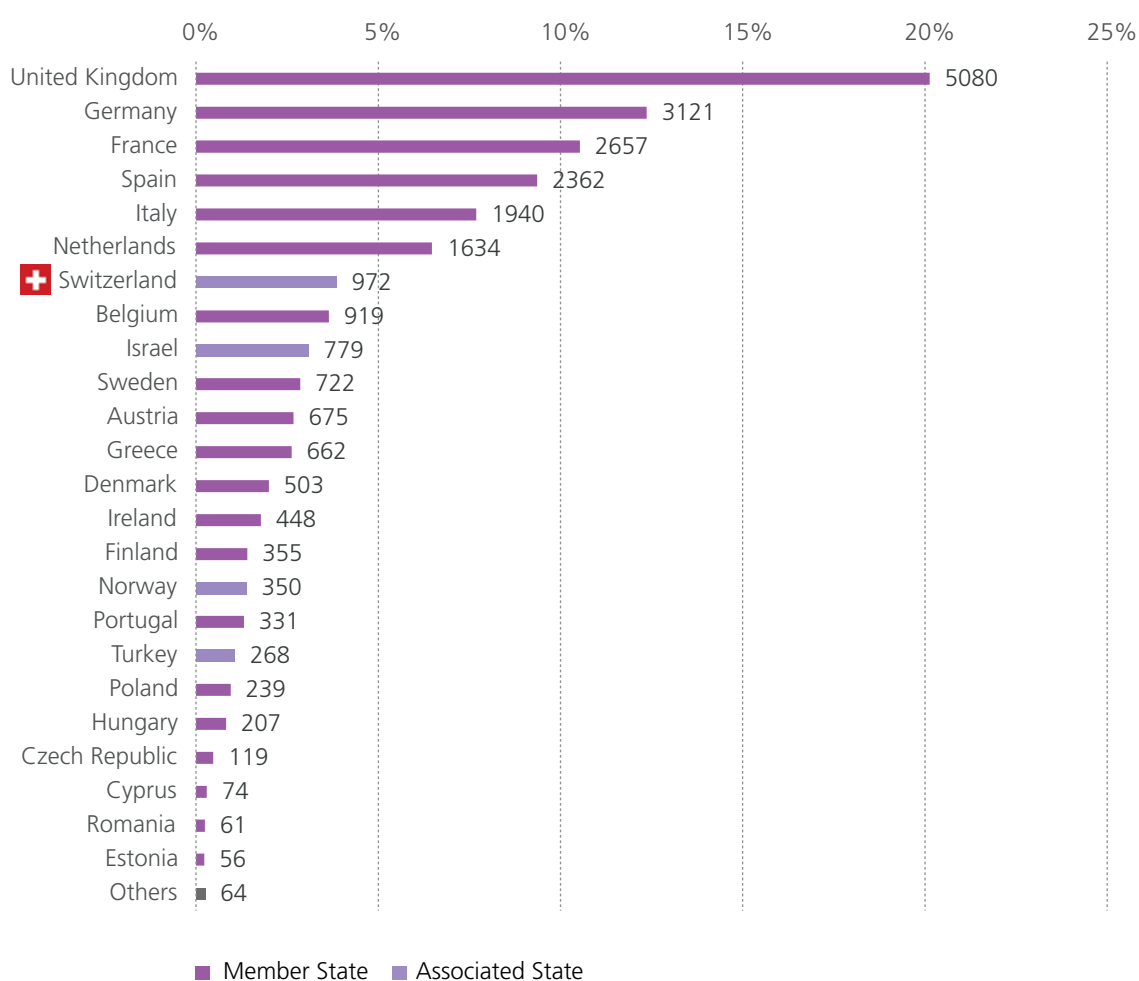
Sources: European Commission, SERI, cf. Table 12

4.6.2 Number of coordinations per country

The ranking of countries by numbers of project coordinations presents a very similar picture to the ranking by numbers of participations (cf. previous section), with two exceptions: first, the United Kingdom has fewer participations (17,561) than Germany (18,088), but coordinates over one and a half times more projects (5080 as against 3121). Second, Belgium and Sweden are behind Switzerland in this statistic, even though both countries have more participations.

With 972 coordinations (3.9% of all project coordinations), Switzerland ranks seventh. This means that its share has increased significantly compared to FP6, in which it stood at 1.9%. This is at least partly because Swiss institutions have only been allowed to coordinate projects since the entry into force of the Association Agreement on 1 January 2004 – i.e. since the second year of FP6. Compared to the last report on Swiss participation in FP7 between 2007 and 2012 (interim report), the relative proportion of coordinations has decreased slightly (from 4% to 3.9%), while Switzerland's position in the ranking has not changed.

Figure 19: Breakdown of project coordinations under FP7 by country



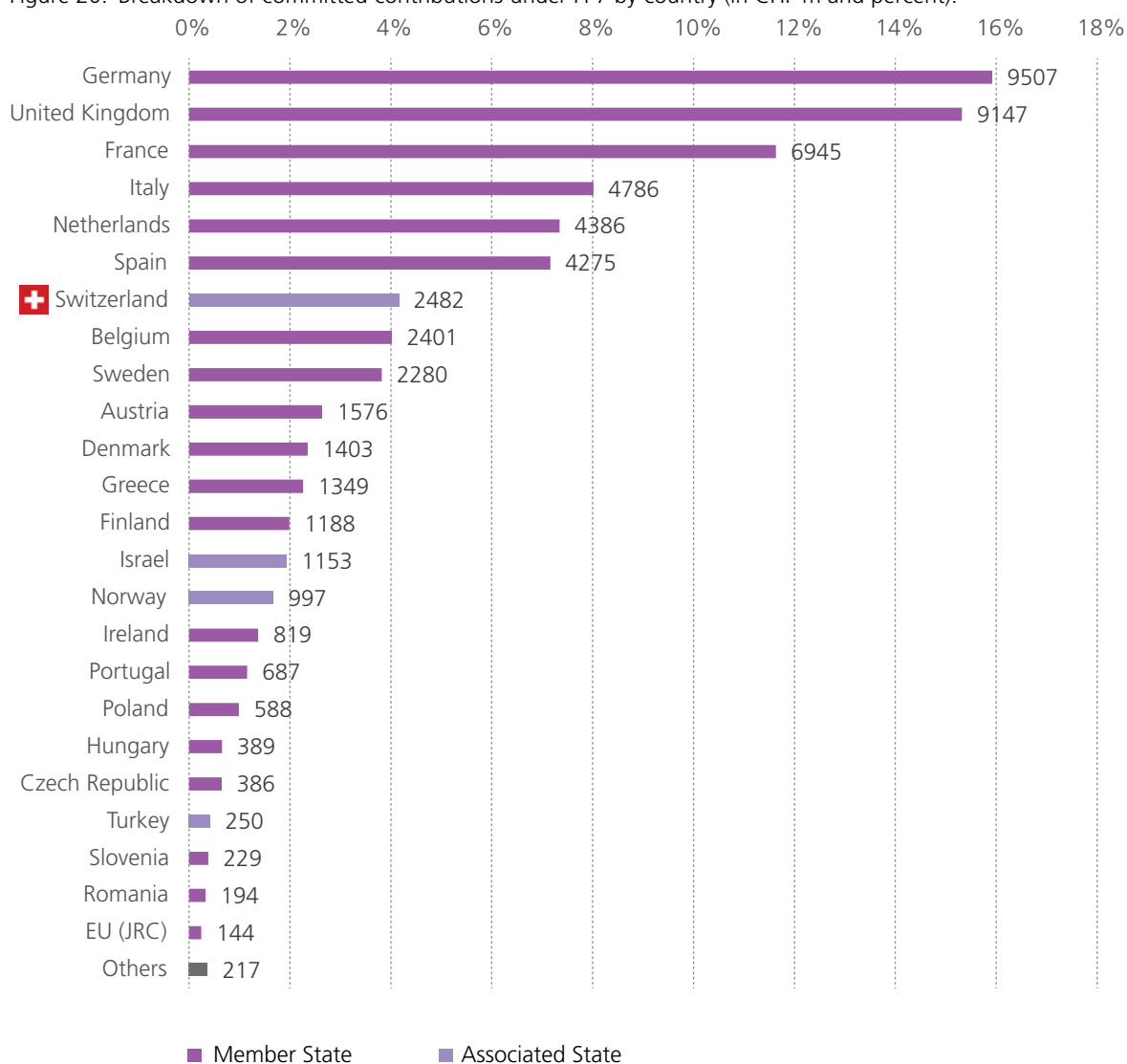
Sources: European Commission, SERI, cf. Table 12

4.6.3 Distribution of committed contributions among participating countries

At 4.2% (CHF 2482.1 million), the proportion of contributions awarded to Swiss institutions under FP7 is higher than Switzerland's share of participations (3.2%) and project coordinations (3.9%). This figure has increased significantly compared to FP6 (3.1%). The discrepancy between the proportion of Swiss participations and the proportion of contributions awarded to Swiss institutions can mainly be explained by two factors. First, Swiss institutions are a privileged destination for researchers who have received an ERC grant. These grants are very highly endowed in comparison with participations in other European projects. Second, Switzerland's high living costs mean that Swiss-domiciled researchers are forced to budget for higher costs, particularly when it comes to wages.

In the ranking of countries by contributions received, Switzerland is in seventh position and represents the highest ranking associated country.

Figure 20: Breakdown of committed contributions under FP7 by country (in CHF m and percent).



Sources: European Commission, SERI, cf. Table 12

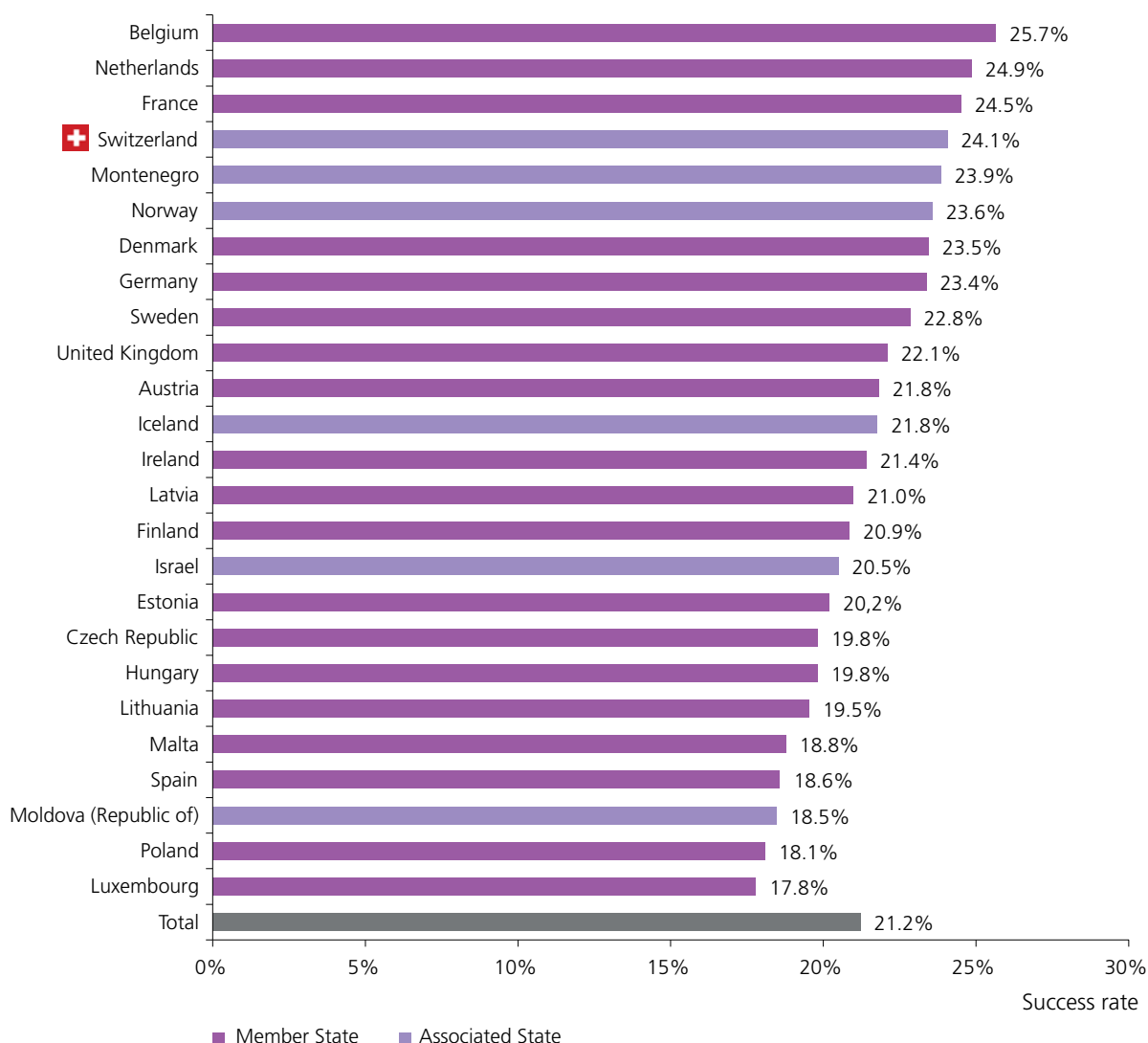
4.6.4 Success rate of project proposals¹⁵

Overall, around one in five project proposals (21.2%) have been accepted and funded under FP7. This percentage can vary considerably, depending on the programme and area (from 10.5% for the socio-economic sciences and humanities, for example, to 44.1% for research infrastructures).

At 24.1%, the success rate for proposals submitted by Swiss research institutions is significantly higher than the overall figure. This suggests that the quality of Swiss project proposals is above average.

In the ranking of countries by success rate, Switzerland comes fourth among the Member States and associated countries, after Belgium, the Netherlands and France. Among the associated countries, Switzerland ranks first, ahead of Montenegro and Norway.

Figure 21: Success rates in % for project proposals submitted under FP7 by country (25 top-ranked Member States and associated countries and success rate of all project proposals (total))¹⁶



Sources: European Commission, SERI, cf. Table 13

¹⁵ These analyses are based on a different database than the one used in the other sections of the report (database of project proposals for FP7, data delivery by the European Commission on 6 October 2014). The figures on numbers of participations given in Table 13, in particular, therefore differ from those indicated in other parts of the report. The latter are based on the database of contracts.

¹⁶ Due to their very small number of entries (41 evaluated projects), the Faroe Islands were excluded from the analysis presented here, but achieved the best result under FP7 with a success rate of 40.5%.

4.7 Financial aspects of Swiss participation

4.7.1 Past framework programmes resulted in Switzerland receiving a net inflow of European research funding

Since its association with the FPs in 2004, Switzerland has experienced a positive financial return flow. In other words, the inflow of funds into Switzerland through project contributions generated by Swiss participations in the fully completed framework programmes has exceeded the Confederation's payments to the EU through mandatory contributions.

Thus, under FP6 (2003–2006), Switzerland's mandatory contributions amounted to CHF 775.3 million, while contributions awarded to Swiss institutions stood at CHF 794.5 million. The net inflow of research funding therefore came to CHF 19.2 million. Under FP7, European contributions totalling CHF 2482.1 million were committed to Swiss participants which corresponds to a tripling of the amount received by Switzerland under FP6. As stated above, the financial balance sheet of FP7 cannot yet be finally calculated, but the following elements suggest that this net inflow has continued and that Switzerland is heading for a positive end result.

4.7.2 Favourable competitiveness indicator for Swiss research

The competitiveness indicator (referred to in previous reports as the "financial return coefficient") gives an important indication of the financial aspects of Swiss participation in FP7: this indicator is a theoretical value which provides information on the ability of a country's researchers to secure competitively awarded research funding. From a technical perspective, the competitiveness indicator is the ratio of the share of total contributions awarded to Swiss institutions to the share of Switzerland's payments to the total framework programme budget. A value of 1 indicates above-average success in securing European funds. Under FP6, 3.06% of all EU contributions went to Swiss institutions, while Switzerland's contribution to the programme's budget came to 2.68%. The competitiveness indicator therefore stood at 1.14.

Based on the available data, the share of contributions awarded to Swiss participants under FP7 can be estimated at 4.16% because around CHF 2482.1 million out of a total of CHF 59,706 million go to Swiss institutions. By contrast, Switzerland's contribution to the FP7 budget from 2007 to December 2013 amounted to CHF 2263.1 million¹⁷, corresponding to a 2.86% share of the total budget. The competitiveness indicator therefore stands at 1.45.

This result represents a slight improvement compared to FP6: it shows that Swiss participants were able to secure 1.45 times as many funds as Switzerland would have been entitled to had they been allocated in proportion to each country's financial contributions to FP7. Switzerland therefore benefits from the largely competitive system of allocating research funds under the EU framework programmes. However, this result does not mean that for every one Swiss franc of mandatory contributions paid into FP7, contributions amounting to CHF 1.45 flow straight back to Switzerland. It merely shows that Swiss researchers performed extremely well in relation to Europe as a whole and that their ability to compete for European contributions is well above average.

Finally, it should be pointed out that Switzerland's financial contribution to the FPs is based on the ratio of the Swiss GDP to the combined GDP of all EU Member States. However, Switzerland's GDP has increased in comparison to the EU's because it has been less badly affected by the economic crisis of recent years. As a result, the share of Switzerland's contribution to FP7 has been increasing in the past years, leading to a slight decline in the competitiveness indicator.

¹⁷ This amount does not include Switzerland's contribution to the non-competitive component of the Euratom programme, which is dedicated to nuclear fusion (Fusion for Energy Joint Undertaking for ITER and Joint Undertaking for ITER – Expenditure on administrative management). In addition, this does not take account either of the cost of providing administrative support for Swiss participation in FP7 or of the CHF 9 million transferred to the Federal Treasury by SERI in 2008 to compensate for foreign exchange losses.

4.7.3 Provisional financial balance sheet of Swiss participation in FP7

The fact that Switzerland's competitiveness indicator is above 1 does not necessarily imply a positive balance sheet for Switzerland at the end of FP7. However, based on the data presented in this section it seems fair to assume that the balance sheet is indeed positive: the figures available to date show that the Confederation made payments to the EU totalling CHF 2263.1 million for Switzerland's participation in FP7, while European contributions amounting to CHF 2482.1 million were committed to Swiss research institutions. This means that, barring any major adjustments to the actual costs of ongoing Swiss participations or the payment of additional contributions, Switzerland will complete FP7 with a positive balance of around CHF 219 million. This would bring the financial return rate to 1.1.

4.7.4 Impact of the exchange rate on research funding actually allocated to researchers in Switzerland

The financial balance sheet of Switzerland's participation in FP7 was also shaped by the trend of the exchange rate between the euro and the Swiss franc. The Swiss franc's increasing strength against the euro meant that Swiss institutions were faced with high exchange rate losses in 2011 and 2012. The reason for this is that the funds requested by Swiss participants were initially budgeted on the basis of cost estimates in Swiss francs. These estimates were then converted into euros at the time of the submission of the project proposals and were committed by the EU accordingly. However, the respective exchange rate was lower than at the time when the contributions were actually disbursed by the EU in euros and converted back to Swiss francs by the Swiss institutions. The projects affected were those whose preparatory and evaluation phases were completed prior to the sharp appreciation of the Swiss franc in 2011, but whose execution extended beyond this date. In light of this problem, and as a one-off support measure, the Swiss Parliament decided to partially compensate recipients of contributions from FP7 for their foreign exchange losses in 2011 by means of a short-term aid package. These funds, amounting to CHF 30 million in total, were disbursed to researchers before the end of 2011 by the then State Secretariat for Education and Research (SER).

A similar phenomenon emerged at the beginning of 2015 when the Swiss National Bank abandoned the minimum exchange rate of CHF 1.20 per euro set in 2011. There are no plans so far for measures to provide compensation for losses suffered by participants in FP7 projects still underway at the beginning of 2015. However, the trend of the Swiss franc/euro exchange rate and its impact on the funding of research institutions in Switzerland will need to be watched closely.

The negative impact of exchange rate movements is clearly apparent in the financial balance sheet of Switzerland's participation in FP7 if the calculation is performed in Swiss francs or euros. As mentioned above, in the former case the likely balance of Switzerland's participation in FP7 stands at CHF 219.0 million. This figure takes account of the fact that the euros needed to finance Switzerland's contribution to the Framework Programme budget were procured in advance (in accordance with Article 70 of the Financial Budget Ordinance) and were thus subject to a significantly less favourable exchange rate than that which applied at the time when Switzerland's mandatory contributions to the EU were actually paid. At the same time, as has been mentioned, owing to the depreciation of the euro against the Swiss franc since 2007, the value of the euro sums committed to FP7 projects decreased significantly during the course of the projects. Thus, if the sums of money involved in FP7 are considered in Swiss franc terms, the Confederation paid its contribution in euros which it had procured at a high exchange rate (i.e. at high cost), whereas Swiss researchers received their contributions in euros which were worth less because of the low CHF/EUR exchange rate. By contrast, if we consider the euro amounts invoiced and transferred by the EU, then this same balance comes to EUR 359.6 million: Switzerland transferred EUR 1513.2 million in mandatory contributions, while Swiss institutions were awarded a total of EUR 1872.8 million for their research projects.

5 Swiss participation in Horizon 2020 (2014–2020)

5.1 Introductory remarks

The figures published here only permit drawing conclusions with regard to Switzerland's participation during the first 1.5 years of Horizon 2020 (period 1 January 2014–15 July 2015). In addition, given that it takes roughly eight months from the submission of a project to its official approval through the conclusion of a funding agreement, research projects resulting from calls dating from 2015 are generally not included in the data at hand. This means that they only allow for initial and provisional findings, which should be interpreted with caution owing to the small number of cases. By 15 July 2015, the European Commission had committed contributions totalling EUR 7.4 billion to European research projects. This corresponds to approximately 9% of the total budget of 82.3 billion euros earmarked for Horizon 2020.

As an introductory note, it should also be pointed out that the complex relationships between Switzerland and the EU in 2014 meant that Swiss institutions were excluded from two calls for proposals from the European Research Council (ERC) and are still not admitted to all calls under Horizon 2020.¹⁸ In addition, their participations in European projects are funded either by the European Commission (EC) or by the Confederation, depending on the programme area (cf. also Section 2.3). These factors should be borne in mind when interpreting the results presented in the following. Section 5.2 provides an overview of the various components of Horizon 2020 and Switzerland's status with regard to each of them (as of autumn 2015).

5.2 Structure of Horizon 2020 and Switzerland's current status

Compared to its predecessor programmes, Horizon 2020 includes a number of organisational simplifications. In terms of content, Horizon 2020 integrates all previous EU programmes and initiatives in the area of research and innovation (Euratom and the EU's participation in the experimental nuclear fusion reactor ITER are new integral components) under a single umbrella with a set of rules that is as uniform as possible. At the same time, various administrative processes have been streamlined. Thus, the duration between project approval and the conclusion of funding agreements has been shortened considerably, and the administration of research projects has been eased, among other things, by basing more calculations on flat-rate costs.

Like the previous framework programmes, Horizon 2020 covers practically the whole value chain, from fundamental research to applied research and technological development. Compared to FP7, Horizon 2020 gives even greater priority to innovation and support for SMEs. In most programme areas, 20% of the budget is targeted for SMEs,¹⁹ and there is a new funding instrument focused specifically on SMEs. In thematic terms, Horizon 2020 does not deviate significantly from its predecessor programme. Although the structure of Horizon 2020 differs from FP7, the disciplines covered are roughly the same.

In the following, brief descriptions of the various programme areas of Horizon 2020 are provided. At the same time, the various conditions for participation for Swiss institutions are explained. A partial association agreement between Switzerland and the EU, negotiated to replace the full association suspended by the EU in February 2014, entered into force on 15 September 2014. This agreement once again enables Swiss institutions to participate in a small number of programme areas as associated and equal partners in the same way as institutions from EU Member States. In all other programme areas, Swiss institutions have the status of third-country participants. As such, they are not entitled to submit project applications for individual funding instruments in those areas. They do, on the other hand, have the option of joining a European collaborative project and being evaluated in Brussels in the same way as any other partner within the consortium. However, they normally receive no EU funding for this.

¹⁸ Swiss researchers were also unable to apply for an MSCA Global Fellowship in 2014. However, this is a relatively small area in budgetary terms.

¹⁹ As against 15% in FP7.

Horizon 2020 mainly consists of three programme pillars (cf. also Figures 22–25):

1. **Excellent Science (budget: EUR 24.4 billion or 31.7% of the total Horizon 2020 budget)** – *Principle*: strengthening the excellent fundamental and pioneering research in Europe. On the one hand, this pillar incorporates two important individual funding instruments. First, the ERC, which was only founded in 2007 but has already established a strong reputation, provides generous grants to fund promising research projects of individual scientists from all disciplines. Second, the proven Marie Curie Actions (now Marie Skłodowska-Curie Actions, MSCA) provide important training and mobility opportunities for young researchers. On the other hand, within the framework of Pillar I contributions are awarded a) for cross-disciplinary collaborations in innovative fields of research with a view to developing future technologies (Future and Emerging Technologies, FET) and b) for ensuring high-quality research infrastructures for the common use of scientists within Europe and beyond. With the introduction of the FET programme, the FET flagships already launched as pilot projects at the end of FP7 were established as permanent instruments.

Switzerland's status: Since 15 September 2014 and until at least the end of 2016, Swiss institutions can respond to all Pillar I calls for project proposals as associated participants and, if successful, will receive direct EC funding. As for calls with submission deadlines before 15 September 2014, Swiss participations in successful collaborative projects are funded by SERI. During this period, Swiss institutions were completely excluded from ERC grants and certain MSCA instruments as these are individual funding schemes.

2. **Industrial Leadership (EUR 17 billion or 22.1%)** – *Principle*: Investments in research and development in key areas of industry (information and communication technologies, nanotechnologies, advanced materials, biotechnology, advanced manufacturing and processing and space). In addition, Pillar II offers innovative companies access to risk finance and includes financial measures focused specifically on SMEs in order to help them establish themselves in the market.

Switzerland's status: Swiss institutions have the status of third-country participants in all calls for proposals under Pillar II. This means that if they are successful, their participation in a European collaborative project is funded not by the EU but by SERI. Swiss institutions' third-country status means that they are completely excluded from individual funding schemes in the context of risk finance and the SME instrument.

3. **Societal challenges (EUR 29.7 or 38.5%)** – *Principle*: Research geared to the political priorities of the Europe 2020 strategy. These measures are focused on current social issues, the solutions to which require cooperation between various disciplines, in particular the humanities and social sciences. Pillar III is structured into seven thematic areas: health; food, agriculture and fisheries; energy; transport; environment (including climate change); inclusive societies; security;

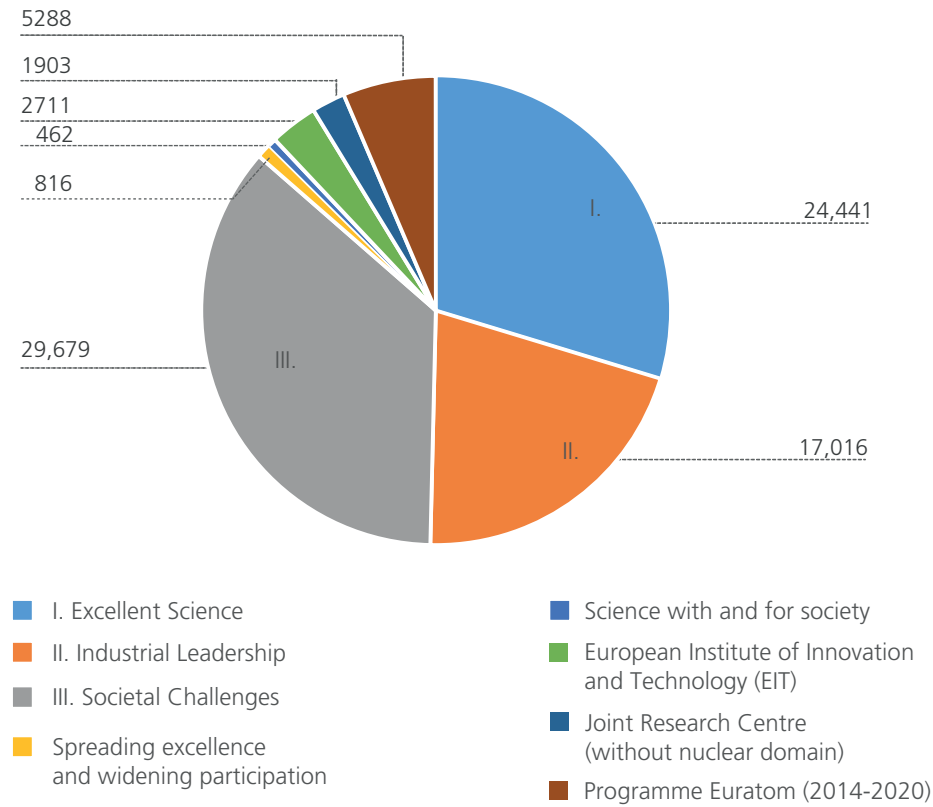
Switzerland's status: As in the case of Pillar II, Swiss partners in European collaborative projects under Pillar III in Horizon 2020 are not eligible for EU contributions and are therefore also funded at national level.

Horizon 2020 has further components in addition to the three pillars: the Euratom programme in the areas of fusion research and nuclear fission and radiation protection (see Sections 7 and 8); the programmes "Spreading Excellence and Widening Participation", "Science with and for Society" and "Fast Track to Innovation Pilot (2015-2016)"; activities of the Joint Research Centre (excluding the nuclear sector); activities of the European Institute of Innovation and Technology (EIT).

Finally, Horizon 2020 also contributes to the budgets of numerous other research and innovation programmes, such as COST (European Cooperation in Science and Technology) or the initiatives under Art. 185 and Art. 187 TFEU (cf. Section 6). Horizon 2020 also provides financial support for the programme "Competitiveness of Enterprises and Small and Medium-sized Enterprises" (COSME, formerly CIP).

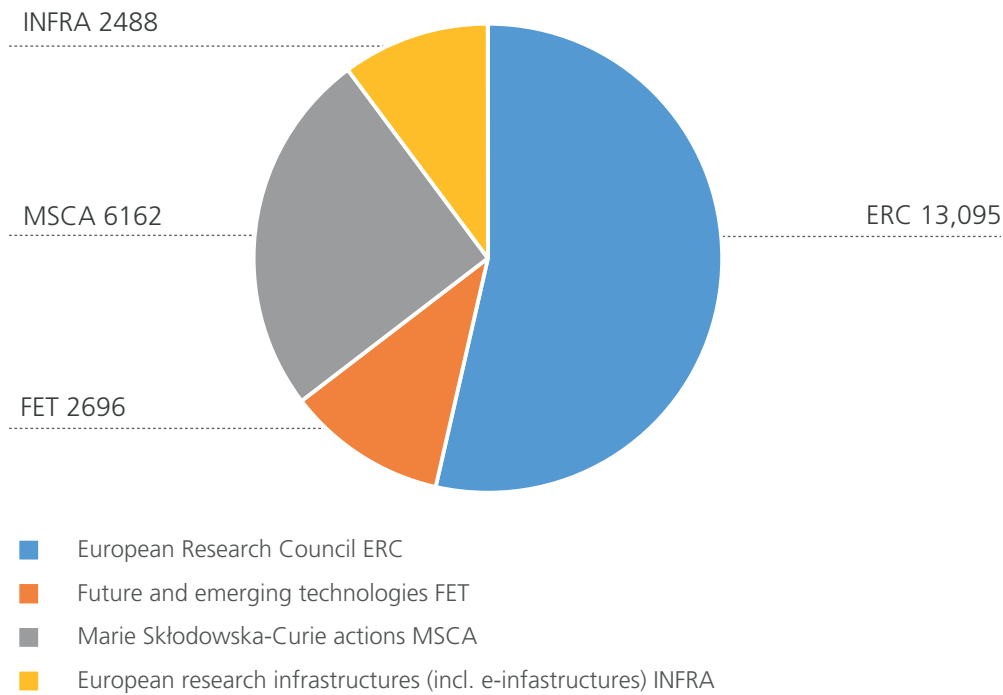
Whereas in Euratom and in the sub-area "Spreading Excellence and Widening Participation" Switzerland has provisional associated status (until the end of 2016), it counts as a third country in all other initiatives listed in the previous two paragraphs. Here, the conditions already described under Pillars II and III apply. The exception, however, is the "Fast Track to Innovation Pilot" programme, which generally excludes third countries.

Figure 22: Breakdown of the Horizon 2020 budget by programme areas (in EUR m)



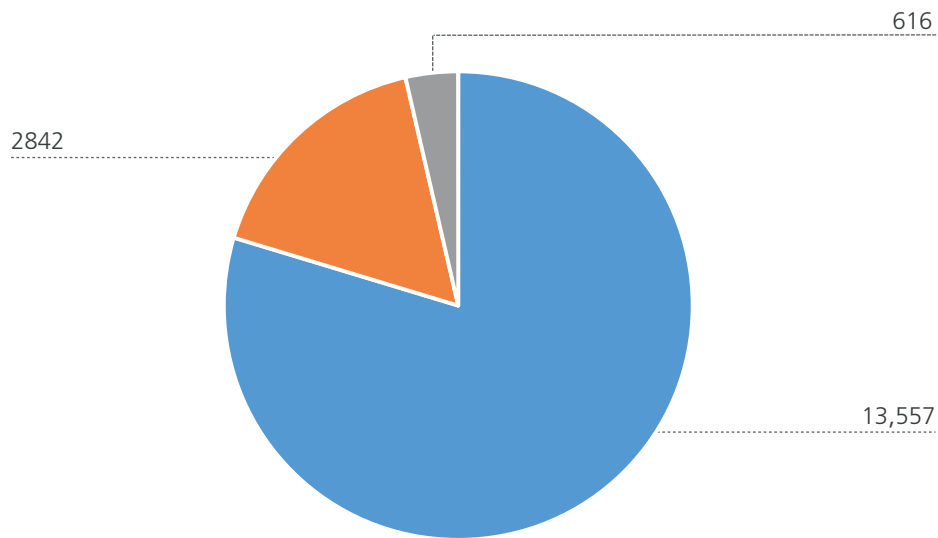
Source: SEC(2014) 357 final, STATEMENT OF ESTIMATES OF THE COMMISSION FOR 2015, (Preparation of the 2015 Draft Budget), Document II, Financial programming 2016, 2020, (Provisional figures), 11.6.2014, cf. Table 14

Figure 23: Breakdown of the Horizon 2020 budget by programme areas in the "Excellent Science" pillar (in EUR m)



Source: SEC(2014) 357 final, STATEMENT OF ESTIMATES OF THE COMMISSION FOR 2015, (Preparation of the 2015 Draft Budget), Document II, Financial programming 2016, 2020, (Provisional figures), 11.6.2014, cf. Table 14

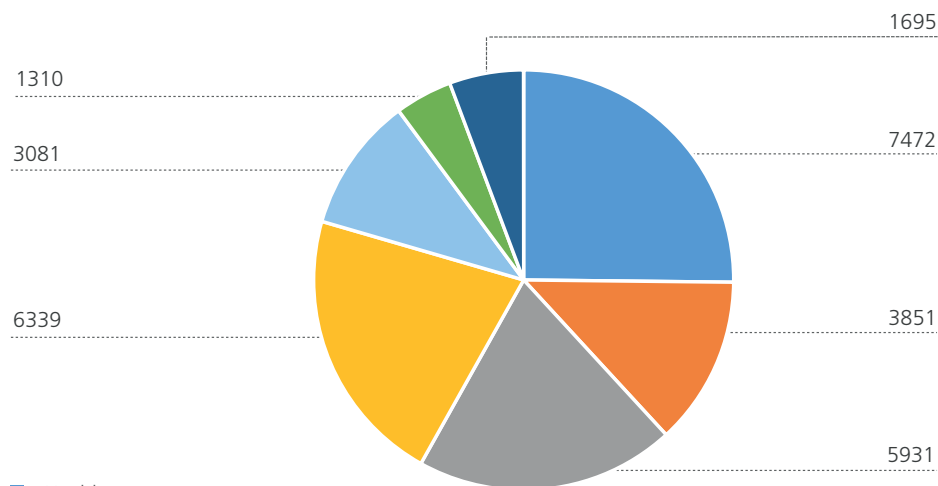
Figure 24: Breakdown of the Horizon 2020 budget by programme areas in the "Industrial Leadership" pillar (in EUR m)



- Leadership in enabling and industrial technologies
- Access to risk finance
- Innovative SME

Source: SEC(2014) 357 final, STATEMENT OF ESTIMATES OF THE COMMISSION FOR 2015, (Preparation of the 2015 Draft Budget), Document II, Financial programming 2016, 2020, (Provisional figures), 11.6.2014, cf. Table 14

Figure 25: Breakdown of the Horizon 2020 budget by programme areas in the "Societal Challenges" pillar (in EUR m)



- Health
- Food, agriculture and aquatic research
- Energy
- Transport
- Climate and environment
- Inclusive societies
- Secure societies

Source: SEC(2014) 357 final, STATEMENT OF ESTIMATES OF THE COMMISSION FOR 2015, (Preparation of the 2015 Draft Budget), Document II, Financial programming 2016, 2020, (Provisional figures), 11.6.2014, cf. Table 14

5.3 National transitional measures

5.3.1 SERI's measures

Even before a temporary solution for at least some areas of Horizon 2020 could be negotiated in the form of the partial association agreement, the Federal Council adopted national transitional measures on 25 June 2014. Their aim is to provide direct support for researchers in Switzerland who are involved in projects and cofinanced programmes of Horizon 2020 but do not receive any funding from the EU. Such direct funding by the Confederation, or project-by-project participation as it is referred to, was already practiced in the past. It is possible in the current situation, as Art. 2 of the Federal Decree of 10 September 2013 on the funding of Swiss participation in the 2014-2020 EU Framework Programmes for Research and Innovation²⁰ allows the Confederation to provide direct funding for project participants in Switzerland in the event of a delay in Switzerland gaining associated status. The implementing provisions are laid down in the revised ordinance on measures for Switzerland's participation in European Union framework programmes in the field of research and innovation²¹ which came into force on 1 October 2014. This provides the Federal Government with the legal basis for the implementation of the transitional measures for Horizon 2020 until the end of 2016. These comprise the following components:

- 1) Direct funding of researchers in Switzerland who are participating in Horizon 2020 collaborative projects in which Switzerland is regarded as a third country.
- 2) Funding of contributions which under other research programmes and initiatives would be co-financed for Swiss researchers by Horizon 2020 if Switzerland was associated: This funding includes in particular the EU's contribution to COST and to specific initiatives according to Art. 185 and 187 TFEU.
- 3) Funding of the national substitute measure offered by the Swiss National Science Foundation (SNSF) for the missed ERC calls for proposals (cf. Section 5.3.2).

SERI is in charge of the implementation of the first two transitional measures. The website www.h2020.ch provides information on the relevant conditions and procedures and allows for the electronic submission of funding requests to SERI.

5.3.2 Temporary Backup Schemes of the Swiss National Science Foundation

As mentioned in the introduction, researchers in Switzerland were not admitted to the ERC's first two calls for proposals in 2014. This was because the submission deadline for these calls had expired before Switzerland's association with the ERC programme was restored on 15 September 2014. At the time of the two deadlines, Swiss institutions had the status of third-country participants and were therefore not eligible to submit applications for individual projects – as is the case with the ERC.

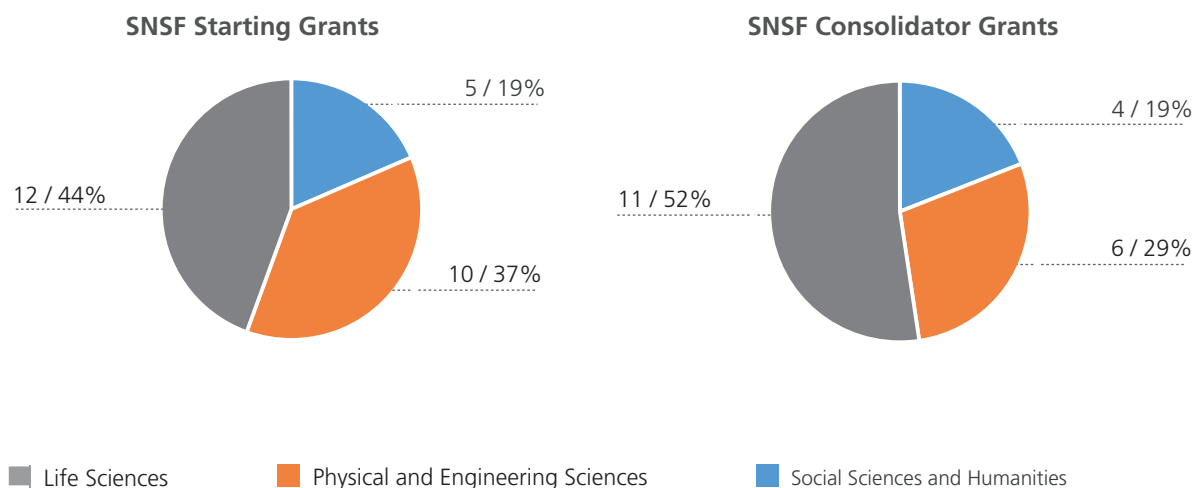
The two missed ERC calls concerned the Starting and Consolidator Grants for young researchers (i.e. researchers with experience after their PhD of 2–7 years and 7–12 years respectively). In light of Swiss institutions' highly successful ERC track record in FP7 (see Section 4.4.3), and hence the great importance of ERC grants for Switzerland as a research location in general and for young scientists in particular, the SNSF launched in March 2014 a substitute measure for researchers based at Swiss institutions. It did so in close consultation with SERI, which provided the SNSF with the necessary financial resources. These Temporary Backup Schemes (TBS), also known as the SNSF Starting and Consolidator Grants, were modelled as closely as possible on their ERC equivalents, both in terms of the scope of the projects and grants and in terms of the evaluation procedure. A total of 27 SNSF Starting Grants, worth on average CHF 1.7 million, and 21 SNSF Consolidator Grants, worth on average CHF 2.2 million, were awarded (CHF 94 million in total).²² Both grants had a success rate of around 19%. These figures are comparable with the previous year's ERC grants (in 2013, 22 Starting Grants and 24 Consolidator Grants went to Switzerland, with success rates of 20.4% and 27.6% respectively). Figure 26 shows the distribution of the TBS among the three areas of disciplines.

²⁰ BBl 2013 7825

²¹ FRPBV; SR 420.126

²² Further information on the TBS can be found in the SNSF report: "Report on the SNSF Temporary Backup Schemes", 2015. http://www.snf.ch/SiteCollectionDocuments/temporary_backup_schemes_report.pdf (24.09.2015).

Figure 26: Distribution of SNSF Starting and Consolidator Grants among the three areas of disciplines



Sources: Swiss National Science Foundation, cf. Table 15

Despite the similarities between the ERC grants and the SNSF's Temporary Backup Schemes, it should be made clear that the two are not equivalent and that the TBS can therefore in no way be regarded as a permanent replacement for the ERC grants. Due to the absence of international competition, a national measure can never have the same prestige. The TBS have nevertheless been a very important short-term measure to cushion the negative impact of the missed ERC calls, particularly since the news that candidates in Switzerland would not be admitted to the two calls in question only came at relatively short notice before the deadlines for submitting applications. By this time, the preparation of project proposals was already well advanced.

The figures for the Temporary Backup Schemes are not taken into account in the following charts and tables (Section 5.4 – 5.8) as the projects in question are not European projects.

5.4 Swiss participations and coordinations by type of institution

As already noted in Section 3, Switzerland counts 318 project participations in Horizon 2020 so far (reference date 15 July 2015), with contributions totalling CHF 172.4 million, provided partly by the EU and partly by the Confederation. This corresponds to 1.8% of all project participations registered in the database so far and 2.2% of total contributions from Europe and Switzerland combined. The average cost of a Swiss project participation therefore stands at CHF 541,997.

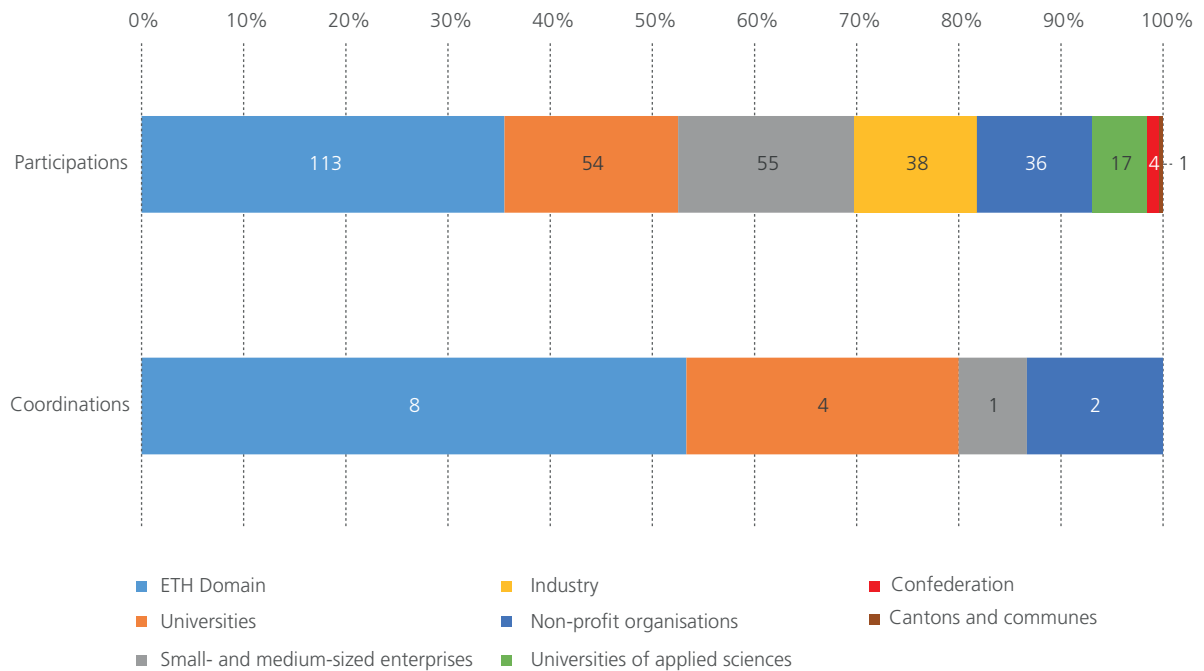
Only 15, or 4.7% of all Swiss participations, were simultaneously project coordinations. This is a low figure in comparison with FP7. Over the period from 2007 to 2013, coordinations accounted for a total of 22.8% of all Swiss participations. On the one hand, the two missed ERC calls in 2014 are likely to have played a part in this decline in Horizon 2020: in the past, Swiss institutions were extremely successful at competing for ERC grants, and as the projects in question are generally individual projects practically all participations in ERC projects are also coordinations. On the other hand, in 2014 there was great uncertainty surrounding Switzerland's participation and coordination options in Horizon 2020. This presumably dissuaded many researchers inside and outside Switzerland from submitting project applications with a coordinator from Switzerland or from participating in such applications.

Figures 27 and 28 show what types of institution have so far had a particularly strong involvement in Horizon 2020 and have benefited the most financially. The proportions of the various types of institution are strikingly similar to those in FP7. As in the previous programme, the ETH Domain clearly dominates in Horizon 2020, with the largest number of Swiss participations (113 or 35.5%) and coordinations (8 or 53.3%), as well as the largest share of contributions in favour of Swiss research institutions (CHF 73.2 million or 42.5%). The two Federal Institutes of Technology in Lausanne and Zurich are particularly major players here, with ETH Zurich securing significantly more participations than EPF Lausanne. However, in terms of numbers of coordinations and total contributions, the two institutions are on a roughly equal footing (cf. Table 16 in the Appendix).

Surprisingly, and in contrast to FP7, the second biggest players in terms of participations are not the universities but – albeit by a narrow margin – the SMEs, with 55 or 17.3% of all Swiss participations. This could be due to the missed

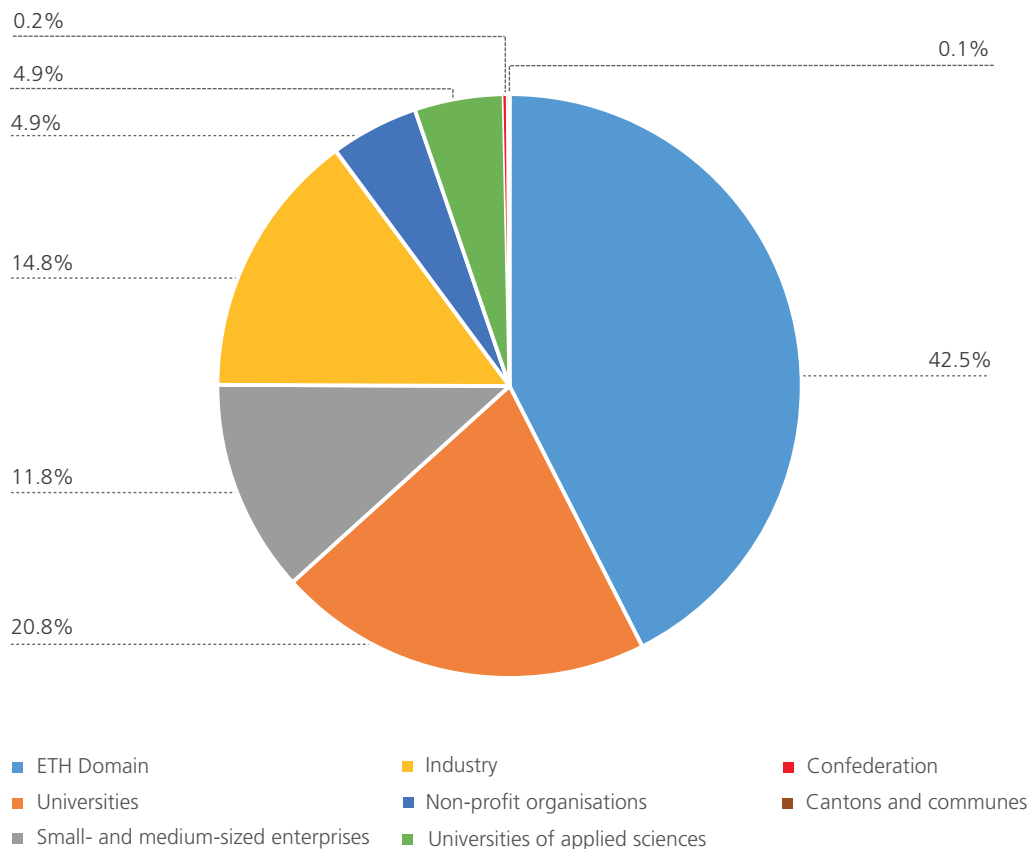
ERC calls, given that the main recipients of ERC grants in Switzerland are the ETH Domain and the universities. However, as far as coordinations and contributions are concerned, the SMEs are well behind the universities. Only 11.8% of all contributions committed to Swiss institutions go to SMEs. This represents a decline of 1.6 percentage points compared to FP7. Thus, at the beginning of Horizon 2020, Swiss SMEs still have a long way to go to meet the EC's target of securing approximately 20% of all contributions.

Figure 27: Swiss participations and coordinations under Horizon 2020 by type of institution



Sources: European Commission, SERI, cf. Table 16

Figure 28: Share of contributions to Switzerland under Horizon 2020 by type of institution



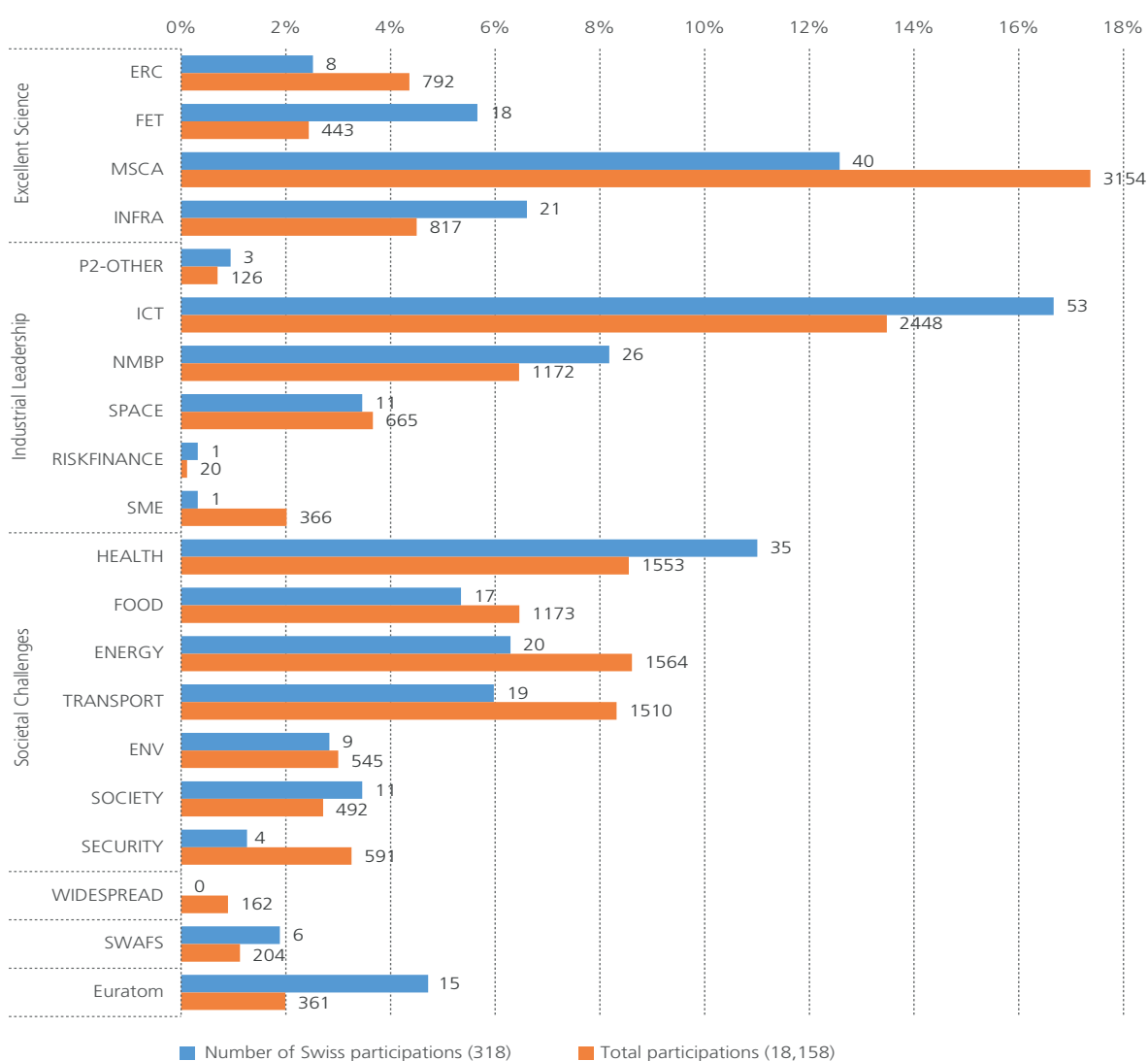
Sources: European Commission, SERI, cf. Table 16

After the ETH Domain, universities account for the largest share of Swiss coordinations and contributions (26.7% and 20.8% respectively). The universities of Bern and Zurich have the most project participations, followed closely by the universities of Geneva and Lausanne (cf. Table 16 in the Appendix). Industry and non-profit organisations have similar numbers of participations at 38 (11.9%) and 36 (11.3%) respectively, although the size of contributions committed to participants from the industry received is three times higher (CHF 25.5 m vs. CHF 8.4 m). The participation of the non-profit sector was already significantly weaker than that of commercial businesses in FP7. As in previous years, the universities of applied sciences rank in third-but-last position in terms of numbers of participations (17 participations at a total of CHF 8.5 million). However, in comparison with FP7, the universities of applied sciences have gained ground in relative terms as they have increased both their share of participations (from 4% to 5.3%) and their share of contributions (from 3.2% to 4.9%). Finally, bringing up the rear, we have the federal, cantonal and local authorities. So far no organisation within the last three categories of institutions mentioned coordinated a project in Horizon 2020.

5.5 Swiss participations by programme area

An analysis of the 318 Swiss participations in Horizon 2020 to date by programme areas shows that, as in FP7, the focus is on the thematic areas of information and communication technologies (ICT), mobility (MSCA), health and nanotechnologies, advanced materials, biotechnologies and advanced manufacturing and processing (NMBP for short).

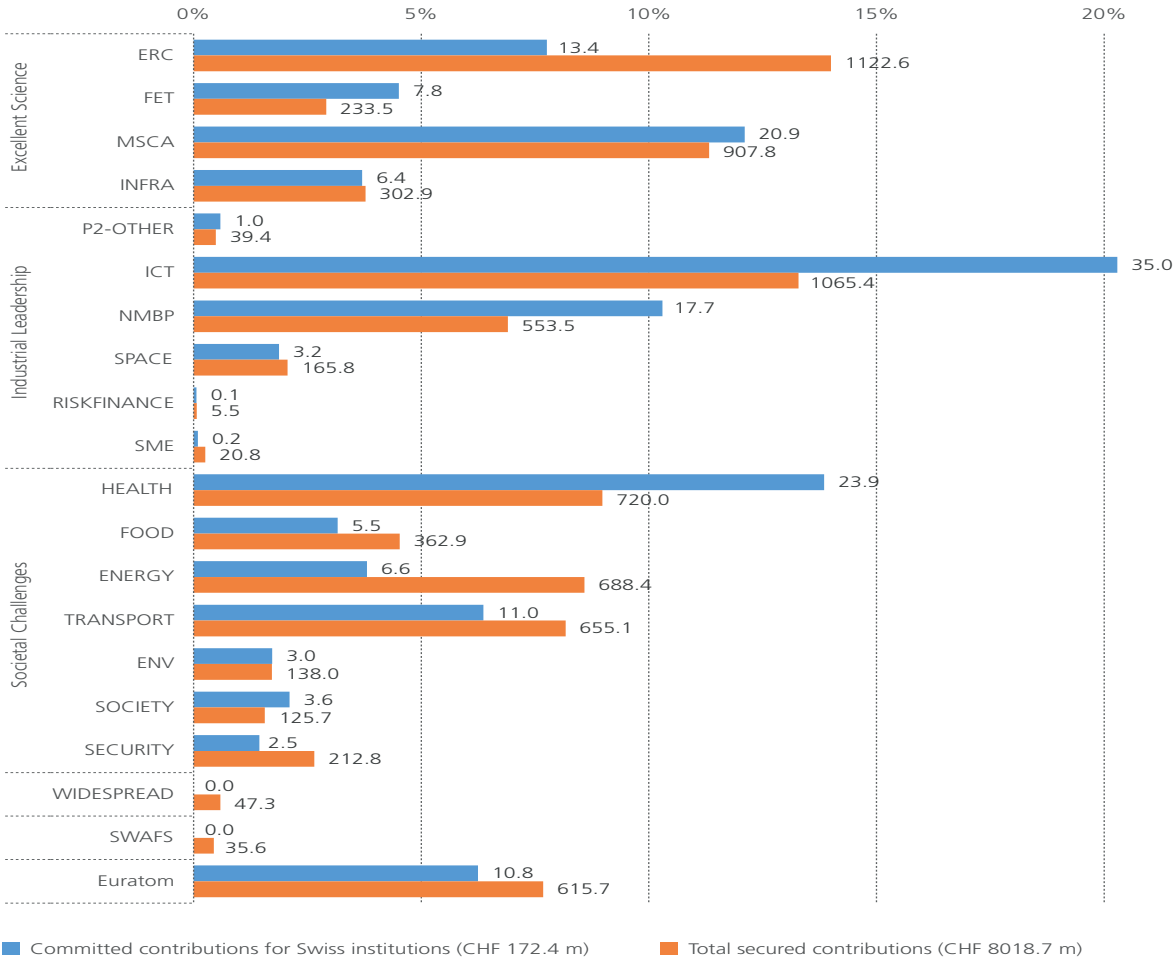
Figure 29: Participations under Horizon 2020 by programme area, shown in the relevant ratios



Sources: European Commission, SERI, cf. Table 18

NB: Swiss institutions are not actually admitted to the "Risk finance" programme area. However, the EC may approve exceptions for projects which it considers particularly worthy of support. This is the case for the one project shown in the chart. Swiss SMEs are also ineligible for participation in the individual support measures of the programme area "Innovation in SMEs". The single Swiss project in this area shown in the chart is thus a participation in a collaborative project.

Figure 30: Contributions under Horizon 2020 by programme area, shown in the relevant ratios (in CHF m)



Sources: European Commission, SERI, cf. Table 18

Note: See Figure 29.

With 53 participations, or 16.7% of all Swiss participations, and contributions totalling 35 million, or 20.3% of all contributions to Switzerland, Swiss institutions are by far most active in the area of ICT. With the exception of the MSCA, the level of Swiss participation in the sub-programmes referred to above is also disproportionately high in comparison with the participations from all countries combined. In addition, among the Swiss participations in Horizon 2020 to date, the themes of research infrastructures, energy, transport and food are well represented and more so than in the previous programme. The shares of the last three are smaller than the European reference values, however. This contrasts with the "Society" area, which mainly comprises calls for proposals in disciplines from the humanities and the social and economic sciences (SSH). Although the share of all Swiss participations here is rather small at 3.5%, it is more than the respective share of 2.7% of participations from all countries. This is interesting, given that Swiss researchers from the SSH disciplines were not particularly active or successful in FP7.

In addition to the disciplines mentioned, Swiss institutions also exhibit a comparatively strong involvement in "Future and Emerging Technologies" (FET), a funding programme newly introduced in Horizon 2020 (18 participations or 5.7% of all Swiss participations). This may be above all due to Switzerland's great success in the FET flagship projects. The European Commission is currently promoting two of these prestigious large-scale international projects which are supposed to run for a ten-year period and have a project volume of approximately EUR 1 billion each. 180 researchers from 112 partner institutions in 24 countries are participating in the "Human Brain Project". Switzerland is providing 23 researchers from 8 institutions and hosts the coordinating institution (EPF Lausanne). Switzerland is also participating in the "Graphene" flagship, with 7 out of a total of 142 institutions from 23 countries involved.

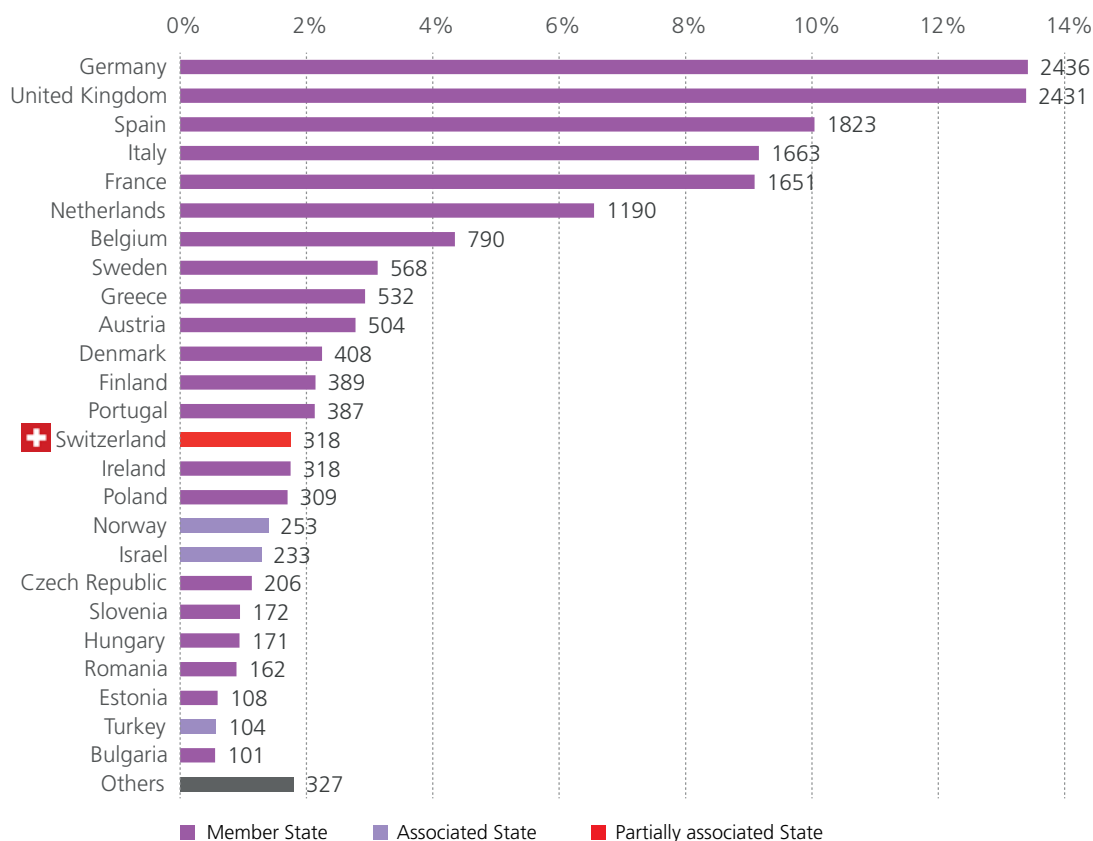
By contrast, Swiss institutions show an unusually low participation in the ERC, compared to both the Swiss figures in FP7 and the Horizon 2020 participations from all countries. This relatively weak result is a logical consequence of the exclusion of Swiss institutions from the first two ERC calls for proposals in 2014. At the same time it should be noted that at least 17 of the 2014 ERC Advanced Grants awarded to researchers in Swiss institutions could not be taken into account in the analysis, as the funding agreements in question had not yet been signed by 15 July 2015, the extraction date for the EC data presented here.

Overall, the ranking of themes discussed is also reflected in the distribution of the amounts committed to Switzerland between the various programme areas (cf. Figure 30).

5.6 Switzerland and Europe compared

So far, Horizon 2020 counts a total of 18,158 project participations. Germany and the United Kingdom account for the largest numbers (13.4% each), followed by Spain, Italy and France. These large countries already topped the rankings in FP7. Switzerland is still the (partially) associated country with the most project participations, ahead of Norway and Israel. But while Switzerland ranked ninth in the previous programme, it fell back to 14th place in the first few years of Horizon 2020, which corresponds to a decline from 3.2% to 1.8% of all participations. This means that it is behind other smaller countries such as Denmark and Portugal and on a par with Ireland. This negative trend is mainly due to Switzerland's situation after 9 February 2014 and the exclusion of Swiss institutions from two ERC calls.

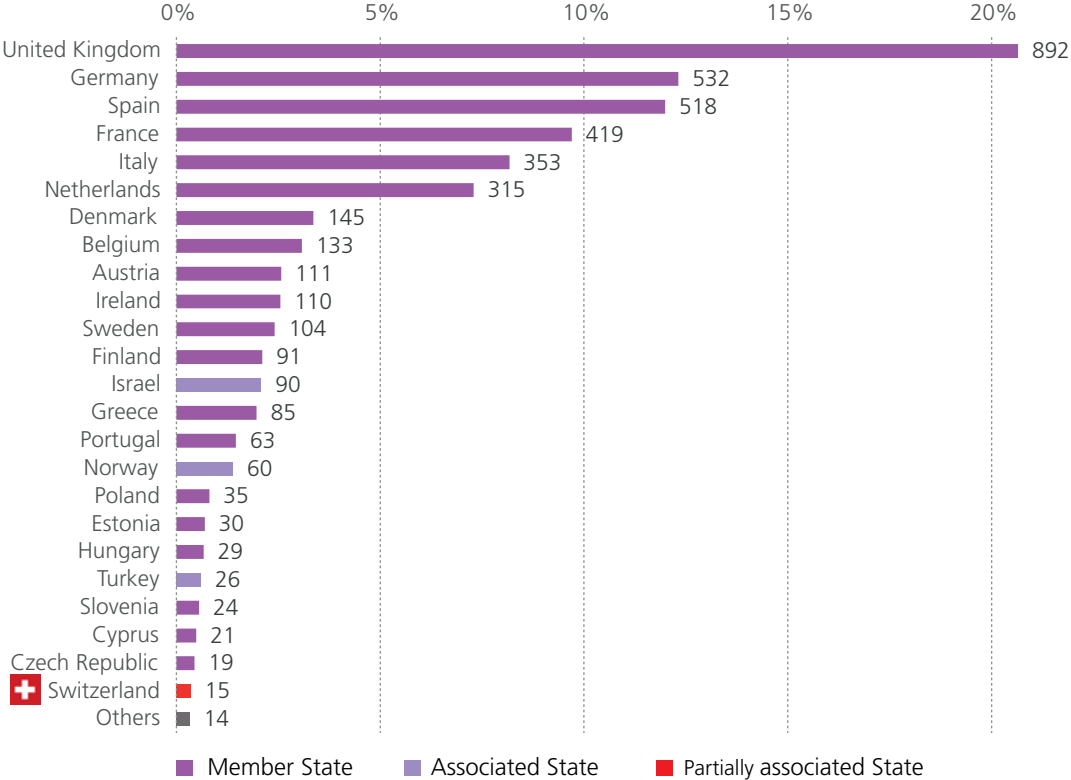
Figure 31: Share of participations (incl. coordinations) in Horizon 2020 per country



Sources: European Commission, SERI, cf. Table 20

The cross-national comparison of the number of project coordinations presents a similar picture at the top: With 20.6% of all coordinations, the United Kingdom ranks first by a wide margin, ahead of Germany at 12.3%. The difference between Switzerland in FP7 and Horizon 2020 is even more pronounced when it comes to coordinations. Whereas in the previous programme Switzerland ranked seventh, with 3.9% of all project coordinations, its share has dwindled to just 0.3% at the beginning of Horizon 2020, leaving it in 24th place. It thus also fell behind other associated countries such as Norway, Israel and Turkey. As already mentioned in Section 5.4, this result appears to be a consequence of the fact that in spring 2014 it was unclear for quite a while whether third-country participants would be able to coordinate projects at all or not. For this reason, many consortia which, while preparing a project proposal, had actually envisaged a Swiss coordination transferred the leadership role to another project partner at short notice.

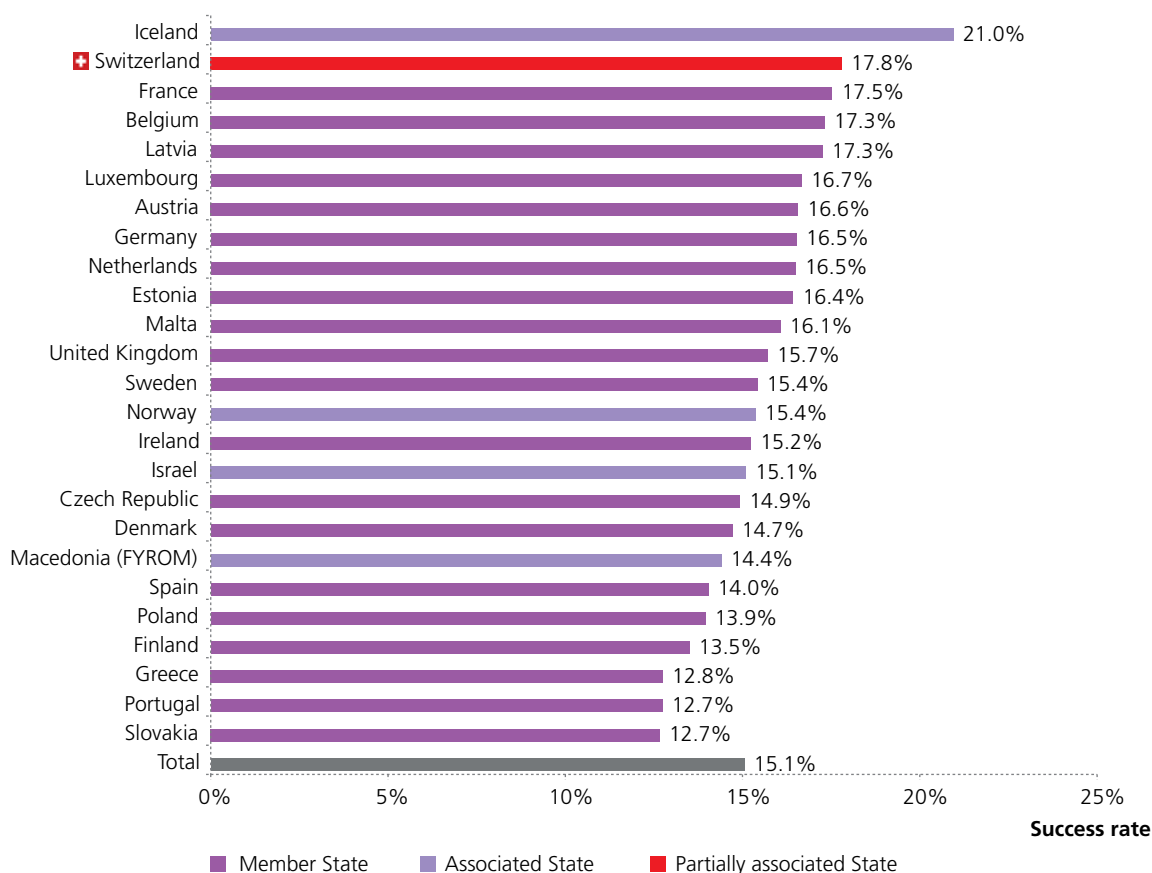
Figure 32: Share of coordinations in Horizon 2020, by country



Sources: European Commission, SERI, cf. Table 20

The big European countries also dominate when it comes to the distribution of committed contributions (cf. Table 20 in the Appendix). Germany accounts for the largest share of CHF 1,648.7 million, or 20.6%. Interestingly, the United Kingdom, which comes in second, is well behind with 13.8% of all contributions, even though both countries have almost the same number of project participations. These two countries also topped the ranking of contribution recipients under FP7, but were almost neck-and-neck with 15.9% (Germany) and 15.3% (United Kingdom) of contributions in that programme. With 2.2% of all contributions, Switzerland finds itself in 12th position after Greece and therefore still ranks first among the (partially) associated countries. However, given that Switzerland was the seventh largest recipient of contributions under the previous programme (4.2%), this rank represents a significant deterioration.

Figure 33: Success rates in % for project proposals submitted under Horizon 2020 by country (25 top-ranked Member States and (partially) associated countries and success rate of all project proposals (total))



Sources: European Commission, SERI, cf. Table 21

NB: The figures exclude countries with less than 100 project proposals (Montenegro, Faroe Islands, Moldova and Bosnia and Herzegovina).

By contrast, the position of the Swiss research landscape in relation to the rest of Europe presents a very different picture if country-specific success rates are compared. On this basis, Switzerland occupies the second position with a success rate of 17.8% in Horizon 2020, behind fellow associated Iceland at 21% and ahead of France, Belgium and Latvia. Roughly every sixth project proposal from a Swiss institution is accepted by the European Commission. This is a very good result. On this front, Switzerland has advanced two places from fourth position in comparison with FP7. At the same time, Switzerland's success rate under the previous programme stood at 24.1% and has thus declined by 6.3 percentage points.

It is generally noticeable that the success rates under Horizon 2020 are significantly lower than under FP7: Whereas between 2007 and 2013 the overall success rate across all project proposals stood at 21.2%, it has fallen to 15.1%. This decline is explained by the fact that calls since 2014 have generally been formulated more openly. This reflects the EC's desire to counter the frequently levelled criticism in FP7 that the expected research was too narrowly pre-defined. However, this measure also had the unwanted side effect of attracting a large oversubscription, i.e. too large a number of project proposals per call, which naturally reduces success rates.

Switzerland's high success rate in comparison with other countries nevertheless shows that its relatively smaller number of project participations (cf. Figure 31) cannot be explained by a poor quality of Swiss project proposals but rather by the fact that presumably only the better-than-average and experienced FP researchers in Switzerland were not put off by the 9 February 2014 vote and discouraged from submitting projects, and/or by the fact that only such applicants could count on their EU partners for collaborations.

5.7 Financial aspects

Since Horizon 2020 was only launched recently and only limited data is available as of yet, it is still too early to draw up a financial balance sheet at this time. Switzerland's partial association also makes it more difficult to calculate a competitiveness indicator of the type presented in Section 4.7 for FP7. As explained in Section 5.2, Swiss participations in Horizon 2020 are funded by different sources. Depending on the programme area in question and on when the project proposals were submitted, the contributions come either directly from the Confederation (81.5%) or from the European Commission (18.5%). Against this background, only three preliminary figures can be presented.

As in FP7, Switzerland pays a mandatory contribution to the framework programme budget. This is based on the ratio of Switzerland's GDP to that of all EU Member States. In Horizon 2020, Switzerland only contributes to the budgets of calls in those areas of the programme to which it is associated and in which Swiss participations are funded by the EC. Switzerland's mandatory contributions since the beginning of Horizon 2020 amount to a total of CHF 153.5 million.²³ According to the latest official EC data (as of 15 July 2015), the same period saw EU research grants amounting to CHF 31.8 million committed in favour of Swiss institutions. This would correspond to an absolute financial return rate of 0.21. It should, however, be pointed out here that said contributions to Swiss institutions originate almost exclusively from calls with deadlines in 2014. The database does not yet include significant contributions due to be allocated to Switzerland for projects on the basis of calls issued in the first half of 2015. As mentioned, this is because several months elapse between the expiry of a deadline for submitting projects and the actual conclusion of grant agreements. At this point, it is therefore not possible to compare Switzerland's mandatory contributions to the EU with the EU's research contributions in favour of Swiss research institutions.

In addition to the mandatory contributions to the EU, the Confederation also allocates resources on a transitional basis to directly fund all Swiss participations in collaborative projects in those programme areas of Horizon 2020 in which Switzerland currently has third-country status, or temporarily had third-country status in 2014. In the context of this "project-by-project" participation, SERI has committed a total of CHF 140.5 million since the beginning of 2014 (as of 21 July 2015). As of 1 August 2015, CHF 54.8 million thereof have already been disbursed. Because the research projects in question normally run for several years, the committed contributions are disbursed in three instalments.

Thus, funding contributions totalling CHF 172.3 million were committed to Swiss research and innovation actors for their participation in Horizon 2020 (CHF 31.8 million by the EU and CHF 140.5 million by the Confederation). As stated in Section 5.6, this corresponds to 2.2% of all contributions awarded under Horizon 2020. However, if Switzerland had been able to secure the same share of contributions under Horizon 2020 as under its predecessor FP7, i.e. 4.2%, Swiss research institutions would have received around CHF 336.7 million. Even if, for the sake of comparability, only the first 18 months of FP7 are examined, at 3.3% Switzerland's share of total EU contributions under this framework programme was larger than the corresponding 2.2% in Horizon 2020. Based on this key figure, contributions to Swiss institutions should have come to CHF 264.6 million instead of the actual figure of CHF 172.3 million.

5.8 Conclusions

Based on the available data, and despite its limited validity, it seems that since the launch of Horizon 2020 Switzerland's participation in the framework programmes has regressed for the first time. The clearest indicators of this are the decline of Switzerland's share of all participations from 3.2% in FP7 to 1.8% to date in Horizon 2020, the marked decline in Swiss coordinations from 3.9% to 0.3% and the reduction in contributions to Swiss research institutions from 4.2% in FP7 to 2.2% of all contributions committed so far under Horizon 2020. On the other hand, the thematic and institutional distribution of Switzerland's participation is very similar to that seen in FP7, with a slightly larger importance of the ETH Domain.

It should be noted that the success rate of project proposals with Swiss participation is still outstanding in comparison with that of other European countries. This means that Swiss research is among the most competitive in Europe. The decrease in Swiss participations in Horizon 2020 can therefore not be explained by a worse quality of research applications.

²³ The stated amount includes the mandatory contribution for 2014, as well as the corresponding tranche for the first half of 2015.

The vote of 9 February 2014 on the mass immigration initiative had a negative effect on the number of the Swiss project proposals submitted and hence Swiss participation in the FPs. Three factors contributed to this situation. First, due to the suspension of Switzerland's association to Horizon 2020, Swiss research institutions and their members were completely excluded from a number of project calls in the months following the referendum. In particular, the interruption of participation in the ERC programme and some MSCA instruments in spring 2014 greatly reduced the number of Swiss participations and coordinations. As Switzerland has once again been associated – albeit only temporarily – to these and other programmes since 15 September 2014, we can expect to see an upward trend on this front.

Second, even today some parts of the framework programme remain inaccessible for Switzerland. This particularly applies to the instruments "Innovation in SMEs", "Access to Risk Finance" and "Fast Track to Innovation Pilot".

Third, the months that followed the acceptance of the mass immigration initiative were marked by a high level of uncertainty over Swiss partners' eligibility to participate in various programme areas of Horizon 2020. It is therefore possible that Swiss research institutions may have given up on participating in certain projects or that the inclusion of Swiss partners was seen as a risk by foreign partners, making Swiss institutions less attractive. Researchers in Switzerland were indeed actively excluded from project consortia or were not re-invited to join previously existing networks. The financial consequences and above all the scientific impact of these developments are currently still difficult to assess.

6 Initiatives under Articles 185 and 187 TFEU

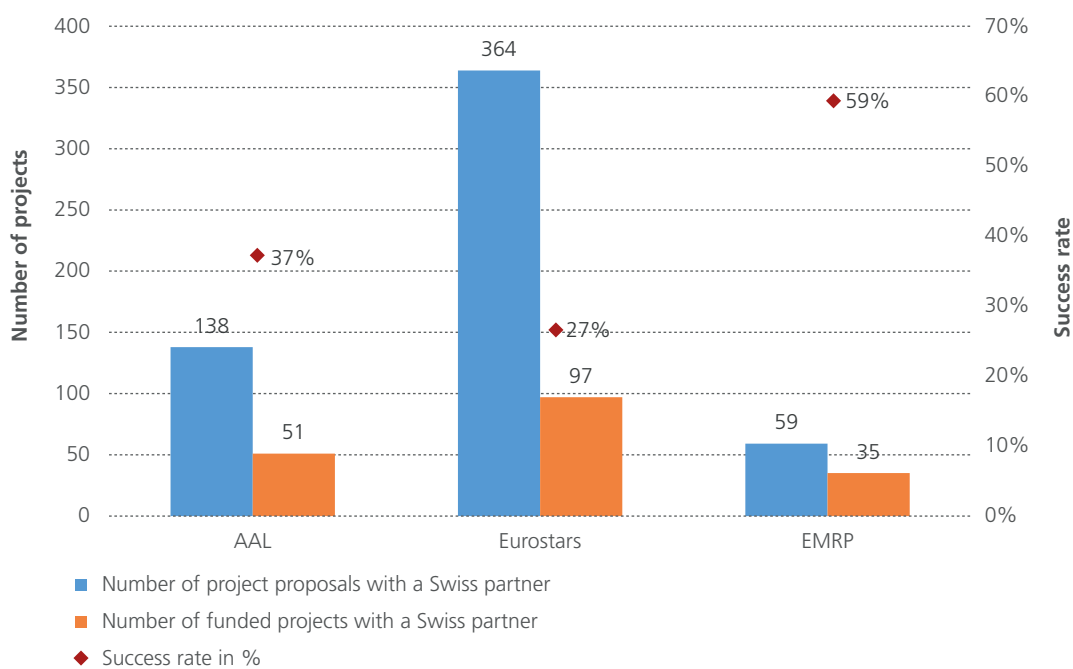
6.1 Initiatives under Article 185 TFEU

The framework programmes help strengthening public-public partnerships (P2P). These measures are based on partnerships between the EU Member States, the countries associated to the FPs and the European Union in accordance with Article 185 of the Treaty on the Functioning of the European Union (TFEU). The aim is to promote the development and implementation of joint research and innovation programmes or activities. Countries participating in such initiatives provide some of the project funding themselves, in addition to which the EU participates with co-financing via the FP budget.

Within FP7, Switzerland was involved in four research and innovation programmes under Art. 185 TFEU: (1) AAL (Ambient Assisted Living), a programme that contributes to meeting the challenges of an ageing society and exploiting the resulting economic opportunities; (2) Eurostars, a programme for market-oriented cross-border R&D cooperation for research-performing SMEs; (3) EDCTP (European & Developing Countries Clinical Trials Partnership), a collaborative research venture for new vaccines and medicines for the prevention and treatment of HIV/AIDS, malaria and tuberculosis; (4) EMRP (European Metrology Research Programme), a programme designed to optimise the research activities of European metrology institutes.

Between 2007 and 2013, a total of 183 projects with Swiss partners were launched in three of the four initiatives mentioned and received financial support from FP7 (cf. Figure 34).²⁴ Relatively high success rates were achieved (between 27% and 59%).²⁵

Figure 34: Swiss project proposals, funded projects and success rate (2007–2013)



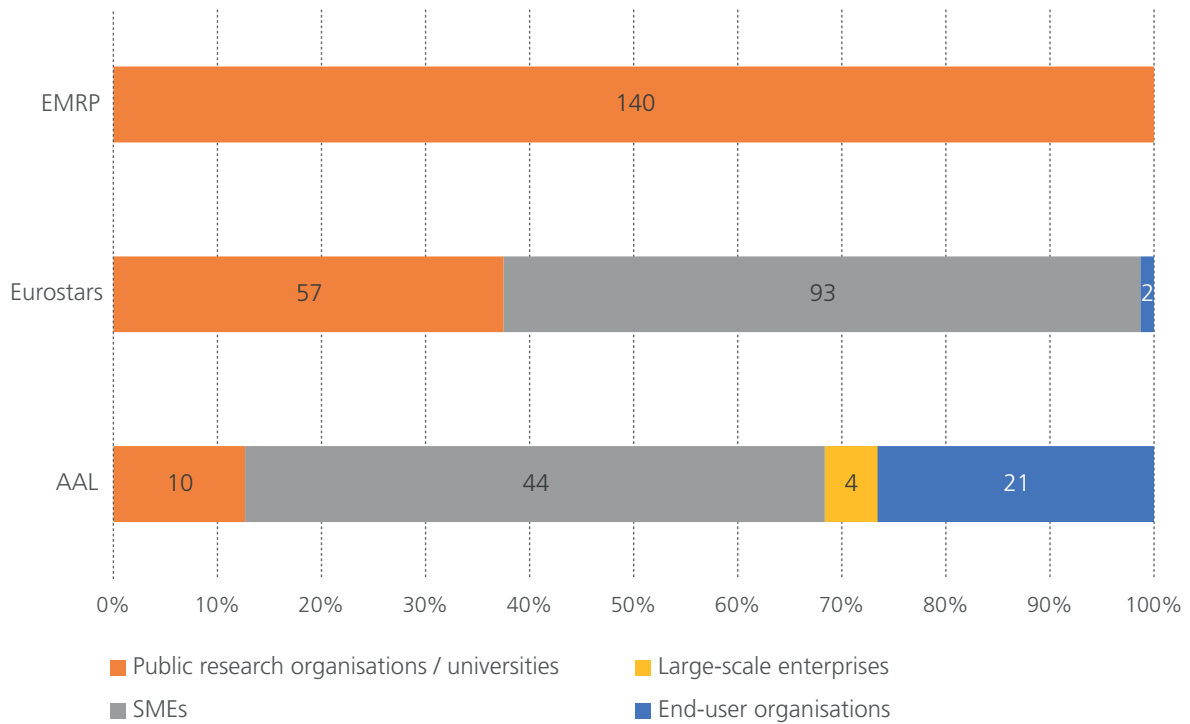
Sources: European Commission, relevant organisations and SERI, cf. Table 23

While Eurostars and AAL typically mobilise industry actors (both approx. 60%), EMRP focuses mainly on participations of public research bodies (cf. Figure 35).

²⁴ The fourth initiative, EDCTP, conducted from 2003 to 2013 with Swiss participation, was funded exclusively by FP6 and is therefore not within the scope of the present analysis.

²⁵ Average success rate in FP7: 21.2% (cf. Table 13).

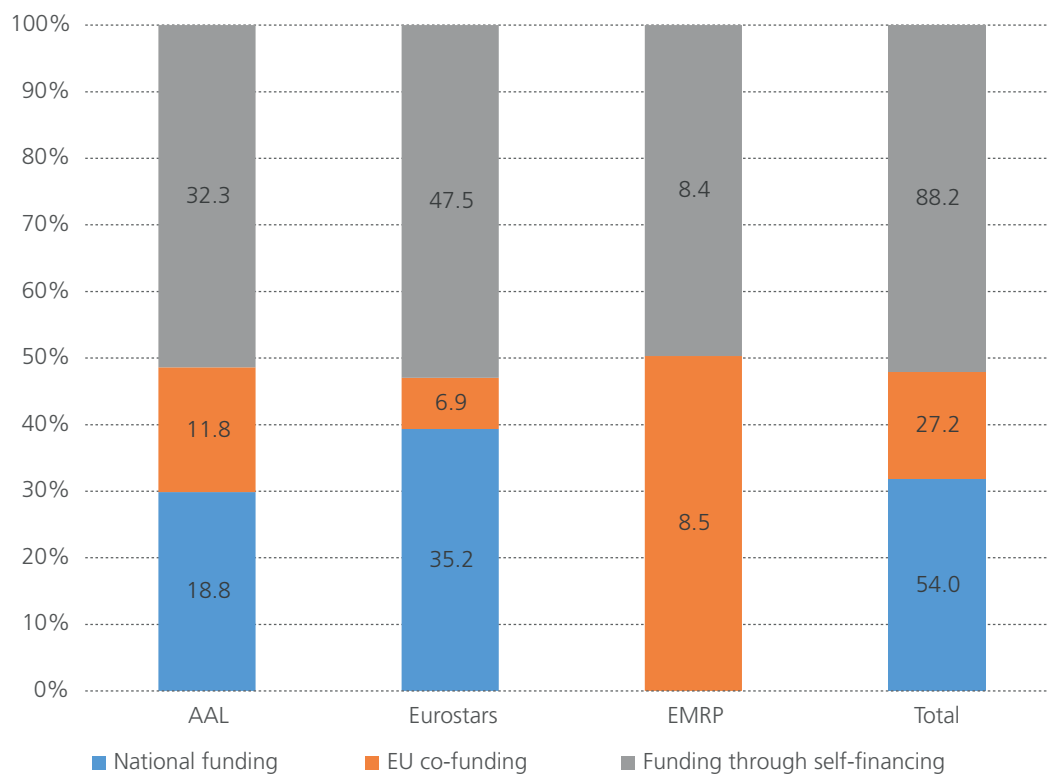
Figure 35: Number of Swiss project participations by category of participants



Sources: European Commission, relevant organisations and SERI, cf. Table 23

The project funding by the Swiss Confederation, totalling around CHF 54 million, resulted in a leverage effect: the EU contributed a total of CHF 27 million, while self-funding by project participants came to a total of approximately CHF 88 million (cf. Figure 36).

Figure 36: Cofinancing percentages (EU / Switzerland/ self-funding) for Swiss participations (in CHF m)



Sources: European Commission, relevant organisations and SERI, cf. Table 23

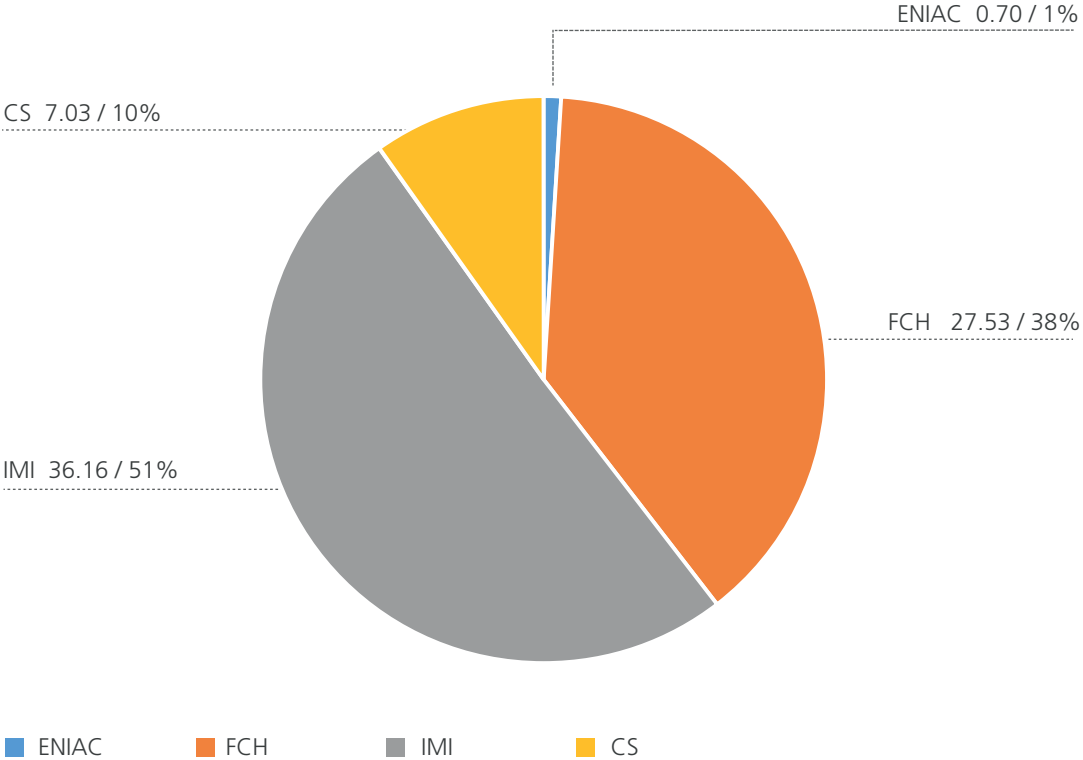
A study²⁶ on the implementation of Eurostars, AAL and EDCTP in Switzerland confirms that the initiatives showed a good level of complementarity with the FPs and with national research funding. In the case of Eurostars in particular, the study found a significant strengthening of the innovative capacity of research-intensive SMEs.

6.2 Initiatives under Article 187 TFEU

The Joint Technology Initiatives (JTIs) are undertaken jointly by the European Union and European industry in accordance with Article 187 TFEU. They were introduced as public-private partnerships under FP7 to create a new funding instrument for the coordination of European research and are co-financed from the budget of the current Framework Programme. These initiatives strengthen the development of strategically important technology areas in Europe. Five JTIs were established in the framework of FP7: 1) Clean Sky (CS) in the field of aviation, 2) Innovative Medicines Initiative (IMI) in the field of drug research, 3) Fuel Cells and Hydrogen (FCH), 4) Advanced Research and Technology for Embedded Intelligence and Systems (ARTEMIS) for embedded computing systems and 5) ENIAC (nanoelectronics).

Swiss research and innovation actors participated in all initiatives except ARTEMIS. Europe-wide, the JTIs were supported by the EU with a contribution of EUR 3.12 billion, to which industry added a further EUR 4.66 billion. Swiss institutions received around CHF 71 million from FP7 for their participation in the JTIs (cf. Figure 37). The Swiss Confederation did not participate with additional resources.

Figure 37: Distribution of payments to Swiss participants across the JTIs from FP7 (in CHF m)

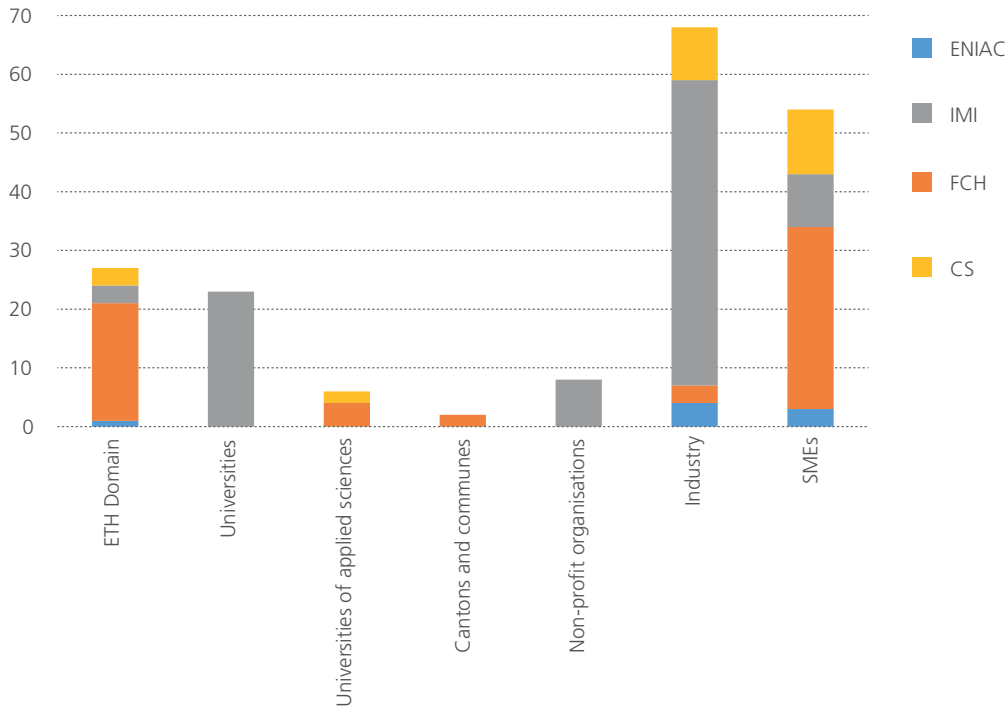


Sources: European Commission and SERI, cf. Table 24

²⁶ Technopolis report, February 2015: "Implementation of the European R&D programs Eurostars, AAL and EDCTP in Switzerland: Analysis of the actors".

SME participation averaged 29% for Switzerland²⁷ (cf. Figure 38).

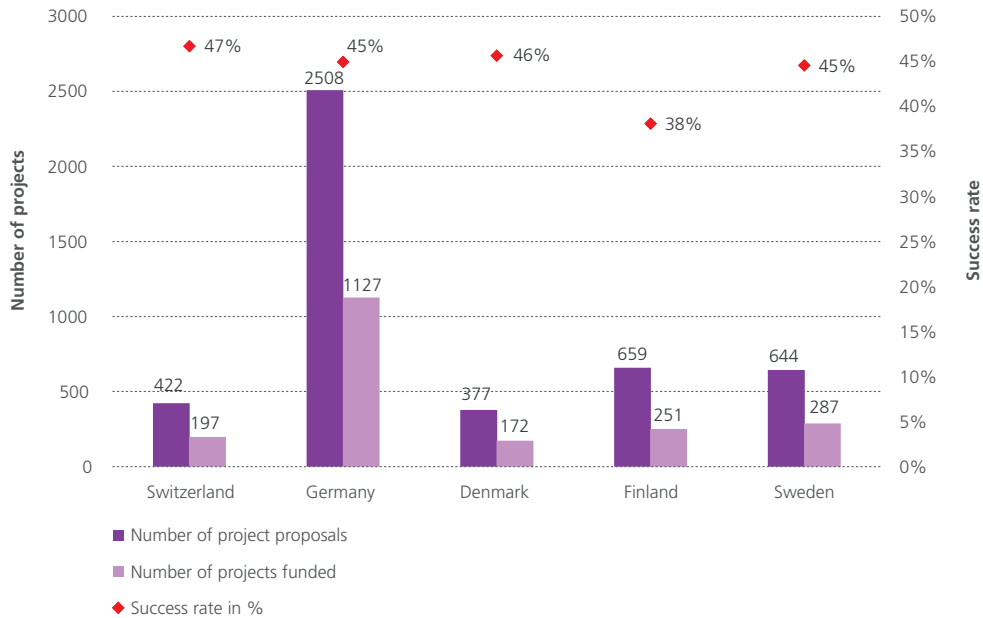
Figure 38: Number of Swiss participations in the JTI's 2007-2013 by type of institution



Sources: European Commission and SERI, cf. Table 24

In international comparison, Swiss participants achieved a very good success rate during the reporting period from 2007 to 2013 for all four initiatives combined (cf. Figure 39).

Figure 39: Project proposals, funded projects and success rate: Switzerland compared to the leading countries of the Innovation Union Scoreboards 2014.



Sources: European Commission and SERI, cf. Table 24

²⁷ Communication from the Commission [COM(2013) 494]; Page 5: "Public-private partnerships in Horizon 2020: a powerful tool to deliver on innovation and growth in Europe".

7 Swiss participation in the Euratom research programmes

7.1 General points

The European Atomic Energy Community, Euratom, which has been in operation since 1958, is one of the three historic communities of the EU. It was established to coordinate the investments and the policies of its Member States in the field of the peaceful and civilian use of nuclear energy. Euratom is managed by the same institutions as the EU, i.e. by the European Commission (EC), the EU Council and the European Parliament. All EU Member States are also automatically members of Euratom. However, the activities performed by Euratom depend on specific provisions of the Treaty which established this community, which means that they are governed by a special framework.

Euratom's current role is essentially to administer research programmes. These complement the EU's research framework programmes in the field of nuclear energy and cover two main areas:

- Nuclear fission (the splitting of heavy atomic nuclei such as uranium), the nuclear reaction used to generate the nuclear power available today.
- Nuclear fusion (the fusion of light atomic nuclei such as hydrogen or helium in a process similar to that taking place in the sun): a nuclear reaction with promising properties. However, nuclear fusion cannot realistically be expected to contribute to power generation before 2050.

The Euratom programmes are structured according to the mode of functioning of the EU's research framework programmes. Some of these programmes comprise a joint fund used to finance research activities in the Member States and associated countries. Other programmes are used to fund the nuclear activities of the Joint Research Centre of the EC, mainly in the field of nuclear fission, as well as research infrastructure in the field of nuclear fusion, used by the Member States and associated countries to conduct joint experiments.

As Switzerland had been occupied with nuclear fusion for many years and had invested heavily in this research area, it has been associated with the fusion part of Euratom's research programmes since 1978. An open-ended cooperation agreement between the two partners formed the basis for this collaboration. From 2004, an agreement enabled Switzerland to participate in all the EU's framework programmes as an associated country. Its association to the "fusion" area of the Euratom research programmes continued in this global context. From 2004, Switzerland was associated to Euratom's "nuclear fission" research programmes.

Switzerland is the only country associated to the EU's research framework programmes that also participates in the Euratom research programmes. This involvement is of great strategic significance to Switzerland. This did not change despite of the new energy policy adopted by Switzerland in 2011. On the one hand, Switzerland's association to the Euratom research programmes enables it to continue its long-standing efforts in nuclear fusion research in an appropriate framework and to contribute its skills in this field at international level. On the other hand, it ensures that Swiss research institutions working on nuclear fission are involved in research projects in Europe which are in line with Switzerland's interests. This particularly applies to the areas of reactors, safety and radioactive waste.

For the Federal Council, Switzerland's participation in the Euratom research programmes is a means of fulfilling the mandate assigned to it by Parliament in motion 11.3564 tabled by Erika Forster-Vannini ("Continuing to secure nuclear research in Switzerland"). Because of their competencies, Swiss institutions receive a proportion of the funds available from the Joint Euratom Fund for both nuclear fission and nuclear fusion. This share is much larger than that which Switzerland pays through its contributions to the Fund.

7.2 Nuclear fusion area of the Euratom research programmes

7.2.1 Context

In 1958, the second International Conference on the Peaceful Use of Nuclear Energy took place in Geneva. From then on, fusion research was officially declassified, meaning that it was no longer classified as a state secret. Three years later, with the establishment of the Research Centre for Plasma Physics (the present-day Swiss Plasma Center, an institute of EPF Lausanne), Switzerland secured itself a place within the group of nations that are considered pioneers in this field of research. Since then, Switzerland has been contributing its first-class specific competencies, which are recognised at international level. It was also actively involved in the development and operation of the joint European Torus (JET). This is the largest test facility for the development of nuclear fusion reactors of the tokamak type, which has been in operation in the United Kingdom since 1983 and in which all European partners jointly conduct experiments. Switzerland is also a full participant in the large-scale ITER project in Cadarache, France, which is of global importance and will replace the JET fusion reactor.

Switzerland's association with the European fusion research programme has enabled it to continue to develop its activities substantially in this area of research. It has, for example, built advanced infrastructure on its own territory, in particular the Variable Configuration Tokamak (TCV) at the Swiss Plasma Center, which was commissioned in 1992 and is one of the three most important facilities of its kind in Europe after JET. Switzerland also plays a crucial role in nurturing young scientists in the field of nuclear fusion. The Swiss Plasma Center is a national laboratory fully integrated into the EPF Lausanne campus. Thanks to this privileged position, it is regarded as a benchmark in the field of training, not just in Europe but worldwide. A full course of study in nuclear fusion at the master's and doctoral level attracts large numbers of students, interns and PhD students from many countries. They study at EPF Lausanne and contribute through their research to the scientific programme of the Swiss Plasma Center and to Switzerland's reputation in cutting-edge research. Finally, another area that pays dividends is the Swiss Plasma Center's participation in the development and use of codes for digital simulations for nuclear fusion: the projects carried out by the Center's scientists, or in which those scientists are involved, have received 20% of the European share of the supercomputer HELIOS – a 1.5-PetaFlop HPC system set up by Europe and Japan which is used for fusion research.

More detailed information on fusion research in Switzerland can be found in the annual reports on this subject, which are coordinated by SERI.²⁸

7.2.2 Swiss participation between 2007 and 2013 (apart from ITER)

Between 2007 and 2013, the European fusion research programme, which is older than the EU's research framework programmes, continued to operate in a special framework and with its own structures. The data on Switzerland's participation in this programme are therefore not included in the data provided by the EC, as presented in the preceding Sections of this report. Aspects relating to the ITER project, which was funded between 2007 and 2013 (also on the basis of the European fusion research programme) are described separately in Section 8.

Beside ITER, between 2007 and 2013 the budget of the European fusion research programme was divided almost equally in a contribution to the operation of JET and the funding of the actual research programme, in order to finance the participating European laboratories. In Switzerland, the funding went to the Swiss Plasma Center.

Between 2007 and 2013, Switzerland transferred mandatory contributions totalling EUR 21.3 million to Euratom for its participation in the European fusion research programme. The size of these contributions is calculated using a formula defined in the cooperation agreement of 1978 which takes account of both the programme's budget and Switzerland's GDP. The contribution formula used for the field of nuclear fusion is slightly more favourable to Switzerland than that applied to the country's association to FP7.

EUR 3.1 million of the said EUR 21.3 million were used for the administration costs incurred by the EC for the management of the programme. EUR 8.8 million correspond to Switzerland's contribution to the actual research programme. In this research programme, Switzerland secured financial contributions of EUR 20.5 million in the form of funding for fusion research projects in Switzerland. Switzerland's scientific excellence is reflected in the financial return rate, which stands at 2.3 for the research programme itself. Euratom generally funds 20% of the total costs of research projects conducted in laboratories. However, it should be noted that since 2007 the funding allocated by Euratom to

²⁸ <http://www.sbf.admin.ch/themen/01370/01632/01637/index.html?lang=en>

the actual research programme has seen a significant reduction compared to previous periods as the EU had to focus its financial commitment in the field of nuclear fusion on the construction of ITER. Despite the excellent financial return between 2007 and 2013, this situation has put the Swiss Plasma Center in a problematic position.

Finally, the remaining EUR 9.4 million of Switzerland's mandatory contributions are used for the operation of the JET test facility, which is co-financed by the EU. Between 2007 and 2013, Switzerland also contributed a further EUR 3.4 million in support of JET directly to a fund jointly maintained by all countries participating in the European fusion research programme. This brings the total cost of Switzerland's participation in JET between 2007 and 2013 to EUR 12.8 million. This sum is used for the operation of JET and does therefore not flow back to Switzerland. In JET, a single experiment is always performed with a specific objective, as is also the case with the experiments in the LHC particle accelerator in CERN. Swiss researchers can take part in these experiments, gain knowledge and actively participate in the analysis of the results. These are the main benefits for fusion research in Switzerland which, however, cannot be directly quantified.

Table 7.1: Distribution of Switzerland's contribution to the European fusion research programme between 2007 and 2013 (in EUR m)

Budget categories	Total resources allocated under the programme	Mandatory Swiss contributions	Contributions to Swiss institutions
Research programme	440.9	8.8	20.5
Operation of JET	469.1	12.8 (including additional contributions to JET)	Not quantifiable
Euratom administration costs	106.1	3.1	0

Source: Swiss Plasma Center, SERI

7.2.3 Swiss participation as of 2014

On 5 December 2014, the open-ended cooperation agreement between Switzerland and Euratom signed in 1978 was replaced by an agreement between Switzerland and the EU concluded as part of the negotiations on a partial association of Switzerland to Horizon 2020. Under this agreement, Switzerland will participate until at least 31 December 2016 in the Euratom research programmes that complement Horizon 2020. Hence, the continued participation of Switzerland in the Euratom programmes depends on whether Switzerland status as country associated to Horizon 2020 is retained.

Up to and including 2013, the European fusion research programme was managed in a separate framework. In 2014, the EU introduced a new system under which the fusion research programme was fully integrated into Horizon 2020. The work plan of the fusion research programme is based exclusively on the document "EFDA Roadmap to the realisation of fusion energy"²⁹. This roadmap pursues the same objective as had already been formulated by Euratom: to generate electricity from nuclear fusion by 2050. The relevant research activities are entrusted to the EUROfusion consortium, in which the Swiss Plasma Center participates as the Swiss member. The EC funds an average of 50% of the project costs for EUROfusion, for which it has set aside EUR 424.8 million for the period 2014 to 2018. Some of this money goes to the Swiss Plasma Center. The amount has not yet been finalised. In addition, the EC also continues to provide 87.5% of the funding for the operation of the JET Tokamak and has earmarked EUR 283.1 million for this purpose for the period 2014 to 2018. Joint experiments will in any case be carried out using this facility until 2018.

Since 2014, data on participation in the European fusion research programme have been integrated into the data prepared by the European Commission for Horizon 2020 as a whole and made available to all participants. Preliminary results on Switzerland's participation in the fusion research programme are therefore included in the tables in the section on Horizon 2020 (Section 5).

²⁹ <https://www.euro-fusion.org/wp-content/uploads/2013/01/JG12.356-web.pdf>

7.3 Nuclear fission area of the Euratom research programmes

Euratom's nuclear fission area is an integral part of FP7 (Section 4) and Horizon 2020 (Section 5). Researchers' participation in this area takes the same form as in the "classic" framework programmes, with calls for the submission of proposals and evaluations, and comes with the same rules and obligations. The tables and charts of the above-mentioned sections therefore always include projects in the area of nuclear fission.

Under FP7, Switzerland counted 58 participations in the area of fission, with committed contributions of CHF 18.2 million (or EUR 13.3 million). The following table provides an overview of Switzerland's contributions to this part of the Euratom programme and the contributions awarded to Swiss institutions. For the actual research programme, the net return for Switzerland is positive and amounts to EUR 2.8 million.

Table 7.2: Distribution of Switzerland's contribution to the nuclear fission section of the Euratom research programme between 2007 and 2013 (in EUR m)

Budget categories	Total resources allocated under the programme	Mandatory Swiss contributions	Contributions to Swiss institutions
Research programme	357.1	10.5	13.3
Operation of the Joint Research Centre (nuclear sector)	737.9	21.7	Not quantifiable
Euratom administration costs	47.5	1.3	Not communicated

Source: SERI

In FP7, Switzerland had a particularly high level of participation in the activity "Reactors and Safety" (27 participations or 46.6% of all Swiss participations), which focuses on reactor safety and innovative reactors. The same applies to the activity "Radioactive Waste" (18 participations or 31%). The other activities received less funding and comprised a total of 13 Swiss participations. In financial terms, the contributions to Swiss institutions provided particular support for the section "Reactors and Safety", accounting for nearly 50% of the funds flowing into Switzerland (cf. Table 25, Appendix C).

With respect to Horizon 2020, 14 of the 15 Swiss participations in Euratom projects in the nuclear fission programme. These 14 participants receive a total of EUR 4.9 million (CHF 5.1 million). Here too, we find a concentration on activities in the areas of safety of nuclear systems and radioactive waste, although the priorities have shifted to the latter area, which accounts for 57.1% of participations and 71% of contributions for Switzerland (Table 26, Appendix C). At European level, the ratios between these activities are balanced in terms of both participations and funding.

No statistical data is available regarding the operation of the Joint Research Centre (JRC) by the EC. In its budget, the Commission specifies an amount which is awarded directly to the Joint Research Centre without any call for proposals. This amount forms part of the remaining FP budget which cannot be attributed to research projects and is thus not included in the databases on the EC's agreements and submitted proposals. It is therefore not possible to quantify the financial return for Switzerland. However, the participation of Swiss researchers makes it possible to take part in the activities of the Joint Research Centre.

8 Swiss participation in ITER

8.1 Context

Nuclear fusion entails great benefits and challenges. This technology should allow for the production of enormous amounts of energy with practically no CO₂ emissions. The necessary fuel is available in large quantities and is distributed all over our planet. A fusion reactor of the tokamak type is intrinsically safe since even a malfunction would not cause a hazardous situation. Approximately a hundred years after its decommissioning, it should be possible to fully recycle the material activated by the nuclear reaction and declare it non-radioactive. All these advantages have to be balanced against one major difficulty: nuclear fusion can only be harnessed under extreme conditions. This poses both a scientific and a technological challenge.

From the outset, the European fusion research programme, to which Switzerland has been associated since 1978, has focused on developing nuclear fusion as an energy source. This strategy has been systematically pursued by the programme participants for nearly 40 years, particularly from 1979 onward, through the construction and successful operation of the JET Tokamak in the UK. This fusion reactor – the most powerful tokamak in operation to date – makes it possible to test how the nuclear reaction works. In 1997, it proved possible to achieve a record power amplification factor Q of 0.65.³⁰

Great progress was subsequently made, paving the way for the launch of the large-scale international project ITER in 2007: a new facility of global significance dedicated to nuclear fusion research whose construction is currently under way in Cadarache (France). Its main purpose is to prove the energy efficiency of fusion by achieving a power amplification factor Q of significantly more than 1. The ITER Tokamak is designed to be capable of achieving a Q factor of 10. Europe, the United States of America, China, South Korea, Japan, India and Russia are the seven partners in this project. Europe is responsible for the largest part of the construction of ITER (6 parts out of 11), including in particular the building that will house the tokamak.

The construction of ITER, which represents an extremely demanding technological challenge, has been delayed considerably. The resulting additional costs need to be monitored particularly closely by all partners in the project, including Switzerland. On the one hand, work on the ITER construction site in Cadarache is making rapid progress and the first major components of the facility were delivered in late 2014. On the other hand, however, all partners have noted that neither ITER's budget nor its current planning are realistic. Against this background, a new Director-General of ITER took office in February 2015: he has committed himself to submit a substantial revision of the planning and budget for the ITER project by the end of 2015.

8.2 Swiss participation in ITER (2007–2014)

The ITER project is the focus of the world's research efforts in the field of nuclear fusion. For this reason, it only makes sense for a country to conduct research in this area if it can participate in ITER in the short or medium term. Switzerland's participation in ITER is of particular importance, in order to ensure the competitiveness of Swiss nuclear fusion research and its centre of excellence, the Swiss Plasma Center at EPF Lausanne. The construction of ITER is also a unique opportunity for Swiss high-tech companies to contribute their skills in the framework of the largest international scientific cooperation project ever undertaken.

Thanks to its long-standing association with the European fusion research programme, Switzerland was involved in the ITER project from the outset. In this project, Switzerland has the same rights as any EU Member State. In ITER's project management, it is represented by the EU. This type of association, which is unique in the context of the ITER project, emerged from the framework established by the cooperation agreement in the field of nuclear fusion concluded between Switzerland and Euratom in 1978. In 2007, Switzerland concluded two additional agreements with the EU in which it recognises the international status of the ITER project and approves the statutes of "Fusion for Energy". Accordingly, Switzerland is also a member of this joint European undertaking which is tasked with the preparation and provision of the European contribution to ITER.

Until the end of 2014, Switzerland allocated resources totalling EUR 130.9 million to the ITER project. These mainly took the form of contributions to the EU, calculated by the same formula as for Switzerland's contributions to the

³⁰ The ratio between the power generated by the fusion reaction and the output of external heat applied to the plasma by the reactor.

European fusion research programme. A small proportion is also transferred to Fusion for Energy directly by way of a membership contribution. EUR 9.5 million of this total amount cover Switzerland's share of the administration costs of the ITER project by the EC and Fusion for Energy. The remaining EUR 121.4 million go into the fund used to finance the actual construction of ITER.³¹

Because ITER is not yet in operation, the benefits Switzerland receives in return for its financial contributions mainly relate to contracts concluded with Swiss companies or research institutions for the supply of components or the development of facilities. The European partners of ITER have no guarantee that their investments will pay off. However, in comparison with other European countries of comparable size, Switzerland benefits from a good industrial return flow³² and from the strategic nature of the tasks assigned to Swiss companies and institutions. For example, all of ITER's superconducting components are tested at the SULTAN facility at the PSI in Switzerland – the only facility in the world available for such purposes. As far as industry is concerned, the ITER valves developed and manufactured by the Swiss company VAT are an example worth mentioning.

Since the start of the project and until 31 December 2014, contracts worth a total of EUR 76.1 million have been concluded with Swiss companies and research institutions by organisations involved in the ITER project. With regard to the construction of ITER, the absolute industrial return rate thus currently stands at 0.63. This represents a substantial Swiss contribution to the construction of a research facility outside its own national territory.

Table 8.2: Distribution of Switzerland's contribution to the construction of ITER between 2007 and 2014 (in EUR m)

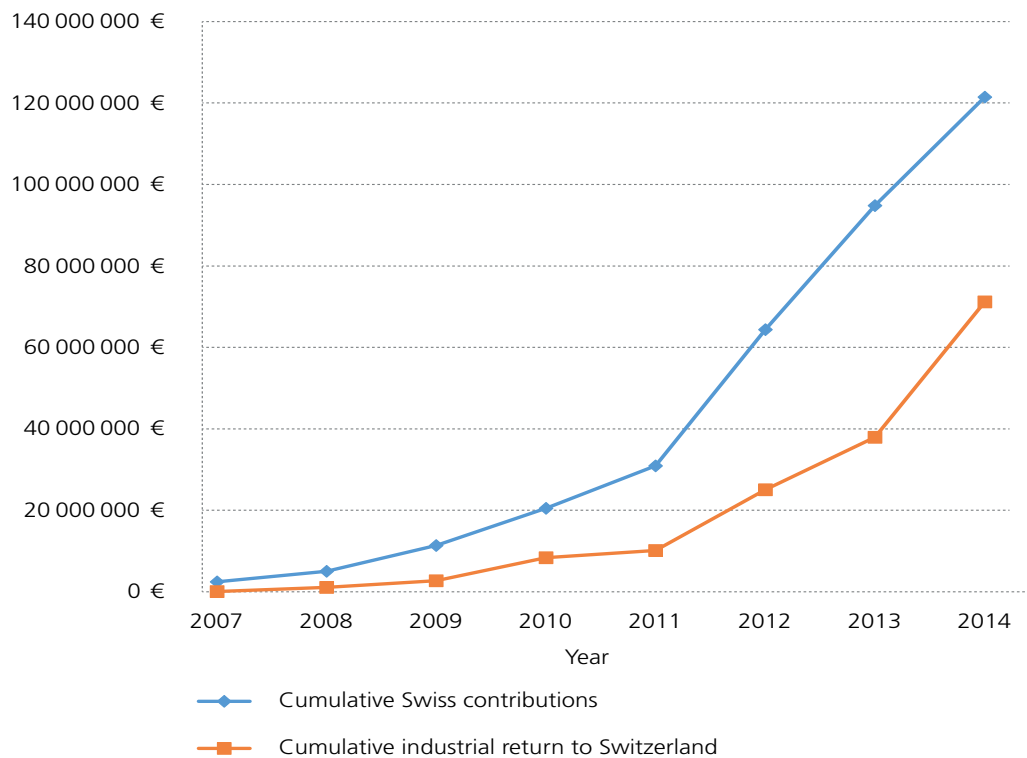
Budget entries	Total funds allocated by the EU between 2007 and 2014	Mandatory Swiss contributions	Industrial return for Switzerland
Construction of ITER	3906.1	121.4	76.1
Administration costs of the European Commission and Fusion for Energy	322.3	9.5	-

Source: SERI

³¹ A small proportion of the EUR 121.4 million corresponds to a contribution to the ITER organisation's administration costs. However, this component cannot be precisely estimated. If it could be deducted, this would improve the return rate for Switzerland.

³² In this section, the term "industrial return flow" refers to the sum of the order volumes of all contracts relating to the construction of ITER concluded with Swiss companies and research institutions.

Figure 40: Cumulative Swiss contribution to ITER and cumulative industrial return flow of ITER to Switzerland per year



Sources: European Commission, SERI

8.3 Swiss Participation as of 2014

As Figure 40 shows, the financial resources which flowed back to Switzerland have increased as the project has progressed. The last three years in particular have seen a significant upward trend. Negotiations, which are at an advanced stage, suggest that major contracts will be concluded with Swiss companies in 2015 and 2016. In addition, Switzerland's contributions will be calculated as a function of the funds committed by the EU in the framework of ITER and not of the payments made, which can span several years for some contracts. So while the number of major contracts concluded in connection with the ITER project should increase, Switzerland's contributions should decline. Switzerland's industrial return flow and participation should therefore move into equilibrium once the construction of ITER will be completed.

In December 2014, the open-ended cooperation agreement concluded in 1978 between Euratom and Switzerland in the field of nuclear fusion was replaced by an agreement signed as part of the negotiations on a partial association of Switzerland to Horizon 2020. Under this agreement, which includes the Euratom research programmes and Switzerland's participation in ITER, Switzerland will contribute to the funding of the ITER project until at least 31 December 2016. Whether Swiss participation will continue thereafter depends on whether the free movement of persons continues in Switzerland and is expanded to Croatia.

Appendix A: Methodological explanations

The data relating to the framework programmes presented in this report come from records which the European Commission regularly transmits to SERI. This data on Swiss project participations are subsequently reviewed by SERI, corrected where necessary and supplemented by additional information.

Unless stated otherwise, the data used in sections on FP7 correspond to the data delivery from the European Commission on 6 October 2014. Because certain projects of FP7 have not yet been completed, the data are not absolutely final. Payments for FP7 projects will be made until 2020. The available data nevertheless provide a reliable picture of Swiss participation after completion of FP7.

The data on the Eighth Framework Programme, Horizon 2020, come from the same source and were processed in the same way, but separately. Unless stated otherwise, they correspond to data extracted and delivered by the European Commission on 15 July 2015.

Some research initiatives or calls for submission of proposals are not managed directly by the Commission but by other organisations. In these cases, the relevant contributions are initially paid from the FP budget to the organisation in question which then forwards them to the researchers entitled to funding. This particularly applies to initiatives under Art. 185 and 187 of the Treaty on the Functioning of the European Union (TFEU). In the case of initiatives based on Art. 185, the European Commission database includes only the total amount transferred to the various organisations concerned. At European level, it is therefore impossible to say who ultimately benefited from contributions and to what extent. In the present report, Swiss participation in initiatives under Art. 185 and 187 TFEU is treated and discussed separately (cf. Section 6).

Unless stated otherwise, all contributions mentioned in the report relate to committed funds and not funds actually disbursed to the recipient research institutions. The European Commission disburses the contributions contractually committed in euros in several instalments over the term of the project. Swiss researchers convert these sums into Swiss francs to pay research costs (wages, equipment).

In this report, the contributions received are stated in Swiss francs. Until 2011, exchange rate fluctuations had little impact, and at the beginning of FP7 there was no indication of the future exchange rate trend. The total amount committed for a Swiss participation in euros was converted into Swiss francs at the average monthly exchange rate at the start of the project, and this sum was distributed proportionately over the term of the project. If the starting date of the project was not available in the database, the date on which the contract was signed was used. From 2015, the exchange rate of CHF 1.06 per euro will be applied. This means that the effective payments to researchers are subject to the current exchange rate. By contrast, Switzerland's contributions to FP7 between 2007 and 2013 were transferred at exchange rates ranging from CHF 1.25 to CHF 1.60 per euro, in line with the Federal Council's hedge against exchange rate risks.

The results published in this report with regard to Swiss participations exclude those by international organisations based in Switzerland.³³ There are two reasons for this: first, it is difficult to attribute researchers attached to international organisations who submit a European project to a specific country. Second, research conducted by an international organisation does not necessarily take place in the country in which the organisation is based. The associated funding is therefore frequently not used in the country in question. Under FP7, contributions totalling EUR 436.0 million were awarded to international organisations (according to database from 6 October 2014); out of this total, EUR 161.7 million went to institutions headquartered in Switzerland.

Finally, it should also be noted that nuclear fusion research is part of the Euratom programme, which was not integrated into the framework programmes until the eighth generation (Horizon 2020). Euratom was the subject of a special European treaty and is subject to different financial provisions. Switzerland's participation in Euratom's fusion research is discussed in Section 7. The projects in the field of nuclear fusion mentioned in Section 4 only cover activities designed to improve the networking and coordination of European fusion research.

³³ These include in particular CERN, the UN, and UN-affiliated institutions.

Appendix B: Abbreviations

TFEU	Treaty on the Functioning of the European Union
GDP	Gross domestic product
CERN	European laboratory for particle physics
CIP	Framework programme for competitiveness and innovation (currently referred to as COSME – programme for the competitiveness of enterprises and SMEs)
EC	European Commission
ERA	European Research Area
EIT	European Institute of Innovation and Technology
ERA-NET+	ERA-NET Plus (European Research Area Network Plus) of the EU (ERA PLUS has been an adjunct to ERA since FP7)
ERC	European Research Council
ESA	European Space Agency
ETP	European Technology Platforms
EU	European Union
Euratom	European Atomic Energy Community (which funds its own research framework programme)
FET	Future and Emerging Technologies – funding instrument under Pillar I of Horizon 2020
FH	University of Applied Sciences
ETH Domain	Domain of the Swiss Federal Institutes of technology: the Federal Institutes of Technology in Zurich and Lausanne (ETHZ and EPFL), the Paul Scherrer Institute (PSI), the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), the Swiss Federal Laboratories for Materials Science and Technology (EMPA) and the Swiss Federal Institute of Aquatic Science and Technology (Eawag).
FP	Framework Programme for Research, Technological Development and Demonstration of the European Union
FPS	The European Atomic Energy Community programme of research and training activities in the nuclear field (Euratom programme) runs in parallel with the EU Framework Programme for Research, Technological Development and Demonstration (FP). The EU Research Framework Programme and the Euratom programme operate in a complementary manner and are closely linked. For the sake of simplicity, both programmes are referred to jointly under the generic concept of EU research framework programmes (FPS).
GMES	European programme of Global Monitoring for Environment and Security
H2020	Horizon 2020 (8th Framework Programme for Research and Innovation)
ICT	Information and communication technologies
IMI	Innovative Medicines Initiative
IP	Integrated projects
JRC	Joint Research Centre of the European Commission
JTI	Joint Technology Initiatives
JU	Joint Undertakings
SMEs	Small and medium-sized enterprises

MSCA	Marie Skłodowska-Curie Actions
MSCA-ITN	Innovative training networks for researchers
NPO	Non-profit organisation (usually a research institution funded via a foundation)
OECD	Organisation for Economic Cooperation and Development
SERI	State Secretariat for Education and Research and Innovation
SNB	Swiss National Bank
SNSF	Swiss National Science Foundation
UN	United Nations

Abbreviations for the specific programmes and research priorities of FP7: cf. Appendix C, Tables 6 and 8

Country abbreviations: cf. Appendix C, Table 13

Appendix C: Tables

Table 1: Annual budgets of the European research framework programmes (in EUR m, at current prices)

	FP 1	FP 2	FP 3	FP 4	FP 5	FP 6	FP 7*	H2020**	Total
1984	593.0								593.0
1985	735.0								735.0
1986	874.0								874.0
1987	701.8	188.1							889.9
1988	260.8	810.6							1071.4
1989	101.1	1241.3							1342.4
1990	4.9	1596.9							1601.8
1991		1270.7	296.0						1566.7
1992		230.9	2160.5						2391.4
1993		14.8	2079.5						2094.3
1994		3.9	2014.7						2018.6
1995		0.2	1.0	2982.5					2983.7
1996				3153.5					3153.5
1997				3485.6					3485.6
1998				3499.3					3499.3
1999					3337.5				3337.5
2000					3607.4				3607.4
2001					3870.8				3870.8
2002					4038.0				4038.0
2003						4029.3			4029.3
2004						4784.5			4784.5
2005						5047.8			5047.8
2006						5251.5			5251.5
2007							5082.0		5082.0
2008							5579.1		5579.1
2009							6119.1		6119.1
2010							6932.7		6932.7
2011							7968.1		7968.1
2012							8926.0		8926.0
2013							9914.0		9914.0
2014								10037.7	10,037.7
2015								10754.0	10,754.0
2016								10862.0	10,862.0
2017								11552.4	11,552.4
2018								12177.9	12,177.9
2019								12957.5	12,957.5
2020								13990.9	13,990.9
Total	3270.6	5357.4	6551.7	13,120.9	14,853.7	19,113.0	50,521.0	82,332.4	195,120.7

Source: European Commission (COM(2004) 533, 786/2004/EC, COM(2005) 119 final, SEC(2014) 357 final)

* Excl. EURATOM

** Incl. EURATOM Fusion and ITER

Table 2: Evolution of priorities of the European research framework programmes (in EUR m)

Priorities	FP1	FP2	FP3	FP4	FP5	FP6	FP7	FP8 (H2020)
Energy + Euratom	408.8	294.7	349.4	590.4	594.1	573.4	649.6	8306.2
Info. and telecom. technol. (ICT)	204.4	562.5	829.9	918.5	891.2	1051.2	1226.9	7711.0
Industry and material	89.9	214.3	327.6	524.8	594.1	382.3	505.2	5961.0
Environment	57.2	80.4	196.6	295.2	371.3	238.9	288.7	3081.9
Life sciences	40.9	93.8	218.4	426.4	594.1	860.1	1082.6	11,326.0
Mobility, grants, education	16.4	53.6	196.6	196.8	259.9	477.8	649.6	6163.8
International cooperation		26.8	43.7	131.2	111.4	95.6		816.7
Innovation and SME		13.4	21.8	98.4	111.4	238.9	216.5	6171.5
Transport and aerospace				65.6	74.3	191.1	721.7	6342.5
Socio-economic sciences and humanities				32.8	37.1	95.6	144.3	3467.1
Fundamental research						143.3	1010.4	18,283.4
Others					74.3	430.0	721.7	1903.1
Average annual budget in EUR m)	817.7	1339.4	2183.9	3280.2	3713.4	4778.3	7217.3	11,362.0
International Thermonuclear Experimental Reactor (ITER)								2915.0
	3270.6	5357.4	8735.6	13,120.9	14,853.7	19,113.0	50,521.0	82,349.2

Source: European Commission, SERI

Table 3: New Swiss participations in European FP programmes, 1992-2015

	FP 3	FP 4	FP 5	FP 6	FP 7	H2020	Total
1992	69						69
1993	147						147
1994	194						194
1995	80	100					180
1996	9	391					400
1997	2	261					263
1998		411					411
1999		117	1				118
2000		7	494				501
2001		2	470				472
2002			468				468
2003			176	159			335
2004			4	499			503
2005				487			487
2006				571			571
2007				200	10		210
2008					606		606
2009					560		560
2010					689		689
2011					654		654
2012					683		683
2013					745		745
2014					312	11	323
2015					10	307	317
Total	501	1289	1613	1916	4269	318	9906

Source: European Commission, SERI

Table 4: Contributions to different types of Swiss institutions participating in the European research framework programmes 1992-2015 (in CHF m and %)

Year	ETH Domain		Universities		Universities of applied sciences		Industry		SMEs		NPOs		Confederation		Cantons and communes		Others		Total		
	CHF m	%	CHF m	%	CHF m	%	CHF m	%	CHF m	%	CHF m	%	CHF m	%	CHF m	%	CHF m	%	CHF m	%	
1992	14.3	32.6	5.4	12.3	0.0	0.0	23.2	52.9	1.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	43.9	100.0
1993	14.8	38.8	9.7	25.4	0.5	1.3	8.5	22.3	3.2	8.4	0.9	2.4	0.5	1.3	0.1	0.3	0.1	0.3	0.1	38.2	100.0
1994	15.2	41.5	11.7	32.0	1.2	3.3	4.3	11.7	2.6	7.1	1.0	2.7	0.1	0.3	0.4	1.1	0.1	0.3	0.1	36.6	100.0
1995	25.7	36.2	9.8	13.8	0.7	1.0	29.7	41.8	4.2	5.9	0.7	1.0	0.1	0.1	0.0	0.0	0.2	0.3	0.2	71.1	100.0
1996	36.7	32.6	32.2	28.6	0.0	0.0	21.9	19.4	14.0	12.4	6.3	5.6	0.6	0.5	0.8	0.7	0.1	0.1	0.1	112.6	100.0
1997	21.6	32.9	16.6	25.3	0.4	0.6	8.8	13.4	14.4	21.9	2.1	3.2	2.0	3.0	0.0	0.0	0.0	0.0	0.0	65.7	100.0
1998	33.7	33.4	22.5	22.3	2.9	2.9	13.7	13.6	15.4	15.3	9.7	9.6	2.4	2.4	0.5	0.5	0.0	0.0	0.0	101.0	100.0
1999	5.2	29.3	3.5	19.7	0.6	3.4	2.1	11.8	4.6	26.0	1.1	6.2	0.6	3.4	0.1	0.6	0.0	0.0	0.0	17.7	100.0
2000	60.0	37.3	43.4	27.0	1.8	1.1	16.1	10.0	28.1	17.5	7.9	4.9	1.5	0.9	2.8	1.7	0.1	0.1	0.1	161.0	100.0
2001	51.3	34.7	35.3	23.9	2.6	1.8	14.5	9.8	26.9	18.2	13.4	9.1	3.1	2.1	0.9	0.6	0.1	0.1	0.1	147.9	100.0
2002	36.8	30.3	34.8	28.7	3.0	2.5	18.2	15.0	17.1	14.1	7.9	6.5	2.2	1.8	1.0	0.8	0.8	0.7	0.8	121.3	100.0
2003	40.0	37.6	18.6	17.5	2.6	2.4	22.6	21.3	13.3	12.5	10.8	10.2	0.4	0.4	0.0	0.0	0.2	0.2	0.2	106.3	100.0
2004	69.9	36.5	56.8	29.7	4.6	2.4	18.8	9.8	23.3	12.2	15.3	8.0	3.8	2.0	0.9	0.5	0.0	0.0	0.0	191.3	100.0
2005	67.3	32.7	59.9	29.1	4.7	2.3	26.2	12.7	29.0	14.1	14.0	6.8	2.1	1.0	2.5	1.2	0.0	0.0	0.0	205.7	100.0
2006	81.8	33.7	70.1	28.9	4.2	1.7	26.0	10.7	32.9	13.6	23.4	9.7	2.8	1.2	1.2	0.5	0.0	0.0	0.0	242.5	100.0
2007	25.4	28.6	26.4	29.7	2.5	2.8	6.0	6.8	17.5	19.7	5.0	5.6	2.1	2.4	3.9	4.4	0.0	0.0	0.0	88.8	100.0
2008	129.3	39.8	83.4	25.6	8.2	2.5	40.0	12.3	42.0	12.9	18.8	5.8	0.9	0.3	2.3	0.7	0.1	0.0	0.0	325.0	100.0
2009	138.7	43.1	100.3	31.2	8.3	2.6	16.5	5.1	33.1	10.3	19.7	6.1	3.5	1.1	1.7	0.5	0.0	0.0	0.0	321.7	100.0
2010	147.6	35.8	111.8	27.1	11.3	2.7	46.7	11.3	56.2	13.6	33.9	8.2	5.1	1.2	0.4	0.1	0.0	0.0	0.0	412.9	100.0
2011	142.0	41.6	88.6	26.0	10.9	3.2	33.0	9.7	35.1	10.3	26.5	7.8	2.6	0.8	2.0	0.6	0.6	0.2	0.2	341.3	100.0
2012	142.0	37.9	104.4	27.8	18.5	4.9	28.2	7.5	64.0	17.1	13.6	3.6	3.4	0.9	0.7	0.2	0.0	0.0	0.0	374.9	100.0
2013	171.1	38.3	101.8	22.8	17.0	3.8	48.2	10.8	71.0	15.9	28.3	6.3	7.4	1.7	1.4	0.3	0.2	0.0	0.0	446.4	100.0
2014	98.6	39.0	105.4	41.7	6.4	2.5	7.7	3.0	19.7	7.8	13.0	5.1	1.3	0.5	0.7	0.3	0.0	0.0	0.0	252.9	100.0
2015	76.2	43.5	35.2	20.1	8.5	4.8	25.5	14.6	20.1	11.5	9.1	5.2	0.4	0.2	0.0	0.0	0.0	0.0	0.0	175.0	100.0
Total	1645.2	37.4	1187.4	27.0	121.3	2.8	506.4	11.5	588.8	13.4	282.4	6.4	49.1	1.1	24.2	0.5	2.6	0.1	0.1	4401.4	100.0

Source: European Commission, SERI

Table 5: Contributions committed to Swiss institutions since the 3rd European research framework programme 1992-2015 (in CHF m)

	FP 3	FP 4	FP 5	FP 6	FP 7	H2020	Total
1992	43.9						43.9
1993	38.2						38.2
1994	36.6						36.6
1995	7.8	63.3					71.1
1996	0.1	112.5					112.6
1997	0.3	65.5					65.7
1998		101					101.0
1999		17.7	0.01				17.7
2000		0.3	160.7				161.0
2001		0.1	147.9				147.9
2002			121.3				121.3
2003			38.6	67.8			106.3
2004			0.7	190.6			191.3
2005				205.7			205.7
2006				242.5			242.5
2007				84.3	4.5		88.8
2008					325.0		325.0
2009					321.7		321.7
2010					412.9		412.9
2011					341.3		341.3
2012					374.9		374.9
2013					446.4		446.4
2014					243.6	9.3	252.9
2015					11.9	163.1	175.0
Total	126.8	360.2	469.2	790.9	2482.1	172.4	4401.4

Source: European Commission, SERI

Table 6: List and budgets of research programmes and priorities in the 7th European Research Framework Programme

Specific programme	Priority / programme	Abbreviation	Budget (in EUR m)	%
Cooperation	Health	HEALTH	6100	12%
	Food, agriculture and fisheries, and biotechnology	KBBE	1935	4%
	Information and communication technologies	ICT	9050	18%
	Nanosciences, nanotechnologies, materials and new production technologies	NMP	3475	7%
	Energy	ENERGY	2350	5%
	Environment (including climate change)	ENV	1890	4%
	Transport (including aeronautics)	Transport	4160	8%
	Socio-economic sciences and the humanities	SSH	623	1%
	Space	SPA	1430	3%
	Security	SEC	1400	3%
	General activities	GA		
Total Cooperation			32,413	64%
Ideas	European Research Council	ERC	7510	15%
People	Marie Curie Actions	PEOPLE	4750	9%
Capacities	Research infrastructures	INFRA	1715	3%
	Research for the benefit of SMEs	SME	1336	3%
	Regions of Knowledge	REGIONS	126	<1%
	Research potential	REGPOT	340	1%
	Science in society	SIS	330	1%
	Coherent development of research policies	COH	70	<1%
	Activities of international cooperation	INCO	180	<1%
Total Capacities			4097	8
Total FP7			50,521	100%
	Euratom Fission	Fission	411	-
	Joint Research Centre	JRC	750	-

Source: Regulation (EU) No 1291/2013, decision No 2006/1982/EC of the European Parliament and of the Council

Table 7: Number of Swiss participations, coordinations and amount of contributions committed, by type of institution under the 7th European Research Framework Programme

Type of institution	Number of participations	%	Of which coordinations	%	Committed contributions (CHF m)	%
EPF Lausanne	350	8.2%	191	19.7%	407.6	16.4%
ETH Zurich	562	13.2%	224	23.0%	443.7	17.9%
Other ETH Domain institutions	235	5.5%	25	2.6%	122.2	4.9%
Total ETH Domain	1305	30.6%	440	45.3%	973.5	39.2%
University of Basel	143	3.3%	52	5.3%	109.5	4.4%
University of Bern	127	3.0%	47	4.8%	81.9	3.3%
University Fribourg	30	0.7%	12	1.2%	13.2	0.5%
University of Geneva	247	5.8%	92	9.5%	186.2	7.5%
University of Lausanne	113	2.6%	45	4.6%	87.4	3.5%
University of Neuchâtel	26	0.6%	6	0.6%	12.5	0.5%
University of St. Gallen	17	0.4%	2	0.2%	6.6	0.3%
University of Lugano	21	0.5%	4	0.4%	12.4	0.5%
University of Zurich	236	5.5%	84	8.6%	185.7	7.5%
Total universities¹	960	22.5%	344	35.4%	695.3	28.0%
Industry	529	12.4%	59	6.1%	222.4	9.0%
Small- and medium-sized enterprises	823	19.3%	34	3.5%	321.3	12.9%
Non-profit organisations	354	8.3%	70	7.2%	154.7	6.2%
Universities of applied sciences	171	4.0%	18	1.9%	80.5	3.2%
Confederation	95	2.2%	5	0.5%	24.4	1.0%
Cantons and communes	27	0.6%	2	0.2%	8.9	0.4%
Total	4269	100.0%	972	100.0%	2482.1	100.0%

Source: European Commission, SERI

¹ Remark: The University of Lucerne has no participation.

Table 8: Participations and committed contributions by research programme and priority for the 7th European Research Framework Programme

Programme / priorities		Swiss participations		Total participations		Committed contributions for Swiss institutions (CHF m)		Total committed contributions (CHF m)	
HEALTH	Health	429	10.0%	11,297	8.5%	252.6	10.2%	6461.1	10,8%
KBBE	Food, agriculture and fisheries, and biotechnology	212	5.0%	7903	5.9%	74.7	3.0%	2448.3	4,1%
ICT	Information and communication technologies	852	20.0%	22,502	16.8%	456.8	18.4%	10,701.3	17,9%
NMP	Nanosciences, nanotechnologies, materials and new production technologies	422	9.9%	10,235	7.7%	207.2	8.3%	4326.4	7,2%
ENERGY	Energy	141	3.3%	4272	3.2%	76.6	3.1%	2286.8	3,8%
ENV	Environment (including climate change)	176	4.1%	7148	5.3%	65.0	2.6%	2302.0	3,9%
TPT	Transport (including aeronautics)	154	3.6%	9029	6.8%	51.6	2.1%	3139.1	5,3%
SSH	Socio-economic sciences and the humanities	43	1.0%	2770	2.1%	14.3	0.6%	775.8	1,3%
SPA	Space	54	1.3%	2636	2.0%	16.0	0.6%	953.9	1,6%
SEC	Security	79	1.9%	3836	2.9%	35.7	1.4%	1666.7	2,8%
GA	General activities (appendix IV)	2	0.0%	183	0.1%	0.2	0.0%	510.6	0,9%
SP1-JTI	Joint Technology Initiatives	189	4.4%	5812	4.3%	71.4	2.9%	2487.1	4,2%
ERC	European Research Council	364	8.5%	5405	4.0%	754.1	30.4%	9869.2	16,5%
PEOPLE	Marie Curie Actions	758	17.8%	19,515	14.6%	290.0	11.7%	6207.6	10,4%
INFRA	Research infrastructures	126	3.0%	5267	3.9%	53.7	2.2%	2129.7	3,6%
SME	Research for the benefit of SMEs	155	3.6%	9124	6.8%	34.1	1.4%	1637.5	2,7%
REGIONS	Regions of Knowledge	9	0.2%	1005	0.8%	1.8	0.1%	167.8	0,3%
REGPOT	Research potential	0	0.0%	307	0.2%	0.0	0.0%	496.3	0,8%
SiS	Science in society	28	0.7%	1820	1.4%	5.2	0.2%	381.0	0,6%
COH	Coherent development of research policies	1	0.0%	131	0.1%	0.1	0.0%	40.2	0,1%
INCO	Activities of international cooperation	14	0.3%	1393	1.0%	2.5	0.1%	231.5	0,4%
Fusion	Nuclear fusion (additional actions)	3	0.1%	67	0.1%	0.3	0.0%	7.9	0,0%
Fission	Nuclear fission and radiation protection	58	1.4%	1958	1.5%	18.2	0.7%	478.2	0,8%
Total		4269	100.0%	133,615	100.0%	2482.1	100.0%	59,706.0	100.0%

Source: European Commission, SERI

Table 9: Swiss participation and success indices by research programme and priority in the 7th European Research Framework Programme

Programme / priority		Number of Swiss proposals	Proportion of Swiss proposals by priority	Proportion of proposals by priority, all countries	Swiss participation index	Success rates of Swiss proposals	Success rates of proposals, all countries	Swiss success index
HEALTH	Health	1544	8.7%	6.5%	1.34	27.4%	25.7%	1.07
KBBE	Food, agriculture and fisheries, and biotechnology	768	4.3%	5.7%	0.76	26.4%	21.3%	1.24
ICT	Information and communication technologies	4450	25.0%	21.2%	1.18	18.2%	16.2%	1.12
NMP	Nanosciences, nanotechnologies, materials and new production technologies	1288	7.2%	5.8%	1.24	30.7%	26.7%	1.15
ENERGY	Energy	403	2.3%	2.7%	0.85	34.2%	25.3%	1.35
ENV	Environment (including climate change)	663	3.7%	5.1%	0.73	29.1%	21.7%	1.34
TPT	Transport (including aeronautics)	510	2.9%	5.1%	0.56	32.5%	29.3%	1.11
SSH	Socio-economic sciences and the humanities	375	2.1%	3.9%	0.55	10.7%	10.5%	1.02
SPA	Space	180	1.0%	1.3%	0.75	30.6%	29.0%	1.06
SEC	Security	360	2.0%	3.1%	0.66	21.4%	19.1%	1.12
GA	General activities (annexe IV)	5	0.0%	0.0%	0.84	80.0%	72.9%	1.10
SP1-JTI	Joint Technology Initiatives (annexe IV-SP1)	422	2.4%	2.8%	0.84	46.7%	40.0%	1.17
ERC	European Research Council	1386	7.8%	6.8%	1.15	23.8%	11.1%	2.15
PEOPLE	Marie Curie Actions	3966	22.3%	17.2%	1.30	20.7%	20.7%	1.00
INFRA	Research infrastructures	378	2.1%	1.7%	1.22	41.0%	44.1%	0.93
SME	Research for the benefit of SMEs	735	4.1%	7.3%	0.56	20.5%	18.8%	1.09
REGIONS	Regions of Knowledge	56	0.3%	0.7%	0.46	16.1%	19.3%	0.83
REGPOT	Research potential	3	0.0%	0.5%	0.03	0.0%	10.1%	0.00
SiS	Science in society	139	0.8%	1.3%	0.60	26.6%	26.7%	1.00

Programme / priority		Number of Swiss proposals	Proportion of Swiss proposals by priority	Proportion of proposals by priority, all countries	Swiss participation index	Success rates of Swiss proposals	Success rates of proposals, all countries	Swiss success index
COH	Coherent development of research policies	5	0.0%	0.1%	0.47	20.0%	33.9%	0.59
INCO	Activities of international cooperation	44	0.2%	0.6%	0.39	34.1%	37.8%	0.90
Fusion	Nuclear fusion (additional actions)	3	0.0%	0.0%	1.32	100.0%	82.3%	1.22
Fission	Nuclear fission and radiation protection	97	0.5%	0.5%	1.03	57.7%	53.9%	1.07
Total		17,780	100.0%	100.0%	1.00	24.1%	21.2%	1.13

Source: European Commission, SERI

Remark: only evaluated proposals are included (excl. inadmissible, withdrawn, duplicates, not specified); the success rates are according to the number of proposals in the category "mainlist" in relation to all eligible proposals; all countries = incl. Switzerland.

Table 10: Participation and success indices for Swiss project proposals to the European Research Council (ERC) in the 7th European Framework Research Programme, for Research by discipline

Theme		Number of Swiss proposals	Proportion of proposals by theme, Switzerland	Proportion of proposals by theme, all countries	Swiss participation index	Success rates of Swiss proposals	Success rates of proposals, all countries	Swiss success index
ERC SG-LS	ERC Starting Grant Life Sciences Domain	214	15.4%	16.3%	0.95	27.6%	11.2%	2,45
ERC SG-PE	ERC Starting Grant Physical Sciences and Engineering Domain	294	21.2%	20.3%	1.05	22.1%	11.7%	1,88
ERC SG-SH	ERC Starting Grant Social Sciences and Humanities Domain	85	6.1%	9.9%	0.62	7.1%	9.2%	0,76
ERC SG-ID	ERC Starting Grant Interdisciplinary Domain	2	0.1%	0.1%	1.73	100.0%	100.0%	1,00
ERC CG-LS	ERC Consolidator Grant Life Sciences Domain	39	2.8%	3.0%	0.92	35.9%	8.7%	4,13
ERC CG-PE	ERC Consolidator Grant Physical Sciences and Engineering Domain	56	4.0%	4.2%	0.95	12.5%	7.4%	1,69
ERC CG-SH	ERC Consolidator Grant Social Sciences and Humanities Domain	18	1.3%	2.1%	0.62	16.7%	6.4%	2,62
ERC AG-LS	ERC Advanced Grant Life Sciences Domain	203	14.6%	11.7%	1.26	29.1%	12.3%	2,37
ERC AG-PE	ERC Advanced Grant Physical Sciences and Engineering Domain	279	20.1%	15.3%	1.32	27.6%	12.3%	2,25
ERC AG-SH	ERC Advanced Grant Social Sciences and Humanities Domain	83	6.0%	8.5%	0.71	13.3%	10.7%	1,24
ERC AG-ID	ERC Advanced Grant Interdisciplinary Domain	8	0.6%	0.2%	2.58	100.0%	100.0%	1,00
ERC SyG	ERC Synergy Grant	71	5.1%	6.7%	0.77	5.6%	2.3%	2,47
ERC PoC	ERC Proof of Concept	31	2.2%	1.4%	1.60	45.2%	33.4%	1,35
ERC CSA	ERC Other and Support Actions	3	0.2%	0.2%	0.90	33.3%	30.7%	1,09
Total		1386	100.0%	100.0%	1.00	23.8%	11.1%	2.15

Source: European Commission, SERI

Remark: only evaluated proposals are included (excl. inadmissible, withdrawn, duplicates, not specified); the success rates are according to the number of proposals in the category "mainlist" in relation to all eligible proposals; all countries = incl. Switzerland.


Table 11: Participation by gender and programme in the 7th European Research Framework Programme

Programme	Swiss Participations		Total Participations	
	Female	Male	Female	Male
ERC	21.0%	79.0%	35.5%	64.5%
People	19.2%	80.8%	27.7%	72.3%
Capacities	34.3%	65.7%	39.7%	60.3%
Fusion and Fission	22.2%	77.8%	34.4%	65.6%
ERC	60.7%	39.3%	41.4%	58.6%
Total	23.9%	76.1%	35.7%	64.3%

Source: European Commission, SERI


Remark: The data provided by the European Commission for the ICT programme does not indicate the gender of participants; for this reason, the ICT programme has not been taken into account.

Table 12: Number of participations and coordinations of projects and contributions committed, by country in the 7th European Research Framework Programme

Country		Status	Number of participations		Of which coordinations		Committed contributions (CHF m)	
AL	Albania	Associated	35	0.0%	1	0.0%	3.1	0.0%
AT	Austria	Member	3516	2.6%	675	2.7%	1575.7	2.6%
BA	Bosnia and Herzegovina	Associated	46	0.0%	5	0.0%	4.2	0.0%
BE	Belgium	Member	5458	4.1%	919	3.6%	2401.1	4.0%
BG	Bulgaria	Member	702	0.5%	46	0.2%	133.5	0.2%
	Switzerland	Associated	4269	3.2%	972	3.9%	2482.1	4.2%
CY	Cyprus	Member	460	0.3%	74	0.3%	122.6	0.2%
CZ	Czech Republic	Member	1415	1.1%	119	0.5%	386.1	0.6%
DE	Germany	Member	18,088	13.5%	3121	12.4%	9506.9	15.9%
DK	Denmark	Member	2754	2.1%	503	2.0%	1402.6	2.3%
EE	Estonia	Member	543	0.4%	56	0.2%	126.8	0.2%
EL	Greece	Member	3706	2.8%	662	2.6%	1349.1	2.3%
ES	Spain	Member	11,164	8.4%	2362	9.4%	4274.8	7.2%
EU	EU (JRC)	Member	363	0.3%	15	0.1%	144.3	0.2%
FI	Finland	Member	2650	2.0%	355	1.4%	1187.8	2.0%
FO	Faroe Islands	Associated	17	0.0%	4	0.0%	3.3	0.0%
FR	France	Member	12,590	9.4%	2657	10.5%	6945.4	11.6%
HR	Croatia	Associated	397	0.3%	39	0.2%	116.8	0.2%
HU	Hungary	Member	1602	1.2%	207	0.8%	388.8	0.7%
IE	Ireland	Member	1957	1.5%	448	1.8%	818.7	1.4%
IL	Israel	Associated	1968	1.5%	779	3.1%	1152.9	1.9%
IS	Iceland	Associated	273	0.2%	46	0.2%	91.0	0.2%
IT	Italy	Member	11,845	8.9%	1940	7.7%	4786.4	8.0%
LI	Liechtenstein	Associated	13	0.0%	2	0.0%	4.0	0.0%
LT	Lithuania	Member	419	0.3%	28	0.1%	73.4	0.1%
LU	Luxembourg	Member	246	0.2%	34	0.1%	78.9	0.1%
LV	Latvia	Member	329	0.2%	29	0.1%	63.6	0.1%
MD	Moldova (Republic of)	Associated	56	0.0%	7	0.0%	5.2	0.0%
ME	Montenegro	Associated	52	0.0%	9	0.0%	5.7	0.0%
MK	Macedonia (FYROM)	Associated	106	0.1%	14	0.1%	16.6	0.0%
MT	Malta	Member	191	0.1%	23	0.1%	27.7	0.0%
NL	Netherlands	Member	8151	6.1%	1634	6.5%	4385.7	7.3%
NO	Norway	Associated	2185	1.6%	350	1.4%	996.6	1.7%
PL	Poland	Member	2210	1.7%	239	0.9%	588.3	1.0%
PT	Portugal	Member	2348	1.8%	331	1.3%	687.2	1.2%
RO	Romania	Member	1057	0.8%	61	0.2%	194.1	0.3%
RS	Serbia	Associated	314	0.2%	42	0.2%	84.2	0.1%
SE	Sweden	Member	4506	3.4%	722	2.9%	2280.0	3.8%
SI	Slovenia	Member	918	0.7%	55	0.2%	228.7	0.4%
SK	Slovakia	Member	484	0.4%	39	0.2%	104.8	0.2%
TR	Turkey	Associated	1162	0.9%	268	1.1%	249.7	0.4%
UK	United Kingdom	Member	17,561	13.1%	5080	20.1%	9147.3	15.3%
	Others		188	0.1%	64	0.3%	216.8	0.4%
	Total		133,615	100.0%	25,237	100.0%	59,706.0	100.0%

¹ Member State since 2013. Source: European Commission, SERI

Table 13: Success rates by country in the 7th European Research Framework Programme

Country		Status	Number of proposals evaluated	Number of proposals awarded funding	Success rate
AL	Albania	Associated	287	41	14.3
AT	Austria	Member	15,437	3368	21.8
BA	Bosnia and Herzegovina	Associated	370	45	12.2
BE	Belgium	Member	22,124	5676	25.7
BG	Bulgaria	Member	4165	673	16.2
	Switzerland	Associated	17,780	4279	24.1
CY	Cyprus	Member	2976	443	14.9
CZ	Czech Republic	Member	6955	1378	19.8
DE	Germany	Member	73,856	17,263	23.4
DK	Denmark	Member	11,401	2674	23.5
EE	Estonia	Member	2450	495	20.2
EL	Greece	Member	22,000	3539	16.1
ES	Spain	Member	57,111	10,611	18.6
FI	Finland	Member	12,567	2622	20.9
FO	Faroe Islands	Associated	,41	17	41.5
FR	France	Member	48,942	11,996	24.5
HR	Croatia	Associated ¹	2337	390	16.7
HU	Hungary	Member	7574	1500	19.8
IE	Ireland	Member	8980	1923	21.4
IL	Israel	Associated	9225	1891	20.5
IS	Iceland	Associated	1194	260	21.8
IT	Italy	Member	63,405	11,271	17.8
LI	Liechtenstein	Associated	69	8	11.6
LT	Lithuania	Member	2104	411	19.5
LU	Luxembourg	Member	1079	192	17.8
LV	Latvia	Member	1467	308	21.0
MD	Moldova (Republic of)	Associated	287	53	18.5
ME	Montenegro	Associated	197	47	23.9
MK	Macedonia (FYROM)	Associated	614	96	15.6
MT	Malta	Member	980	184	18.8
NL	Netherlands	Member	31,534	7840	24.9
NO	Norway	Associated	9104	2146	23.6
PL	Poland	Member	11,978	2167	18.1
PT	Portugal	Member	12,388	2193	17.7
RO	Romania	Member	124	1005	14.1
RS	Serbia	Associated	2111	321	15.2
SE	Sweden	Member	19,153	4376	22.8
SI	Slovenia	Member	5633	859	15.2
SK	Slovakia	Member	2693	468	17.4
TR	Turkey	Associated	7023	1123	16.0
UK	United Kingdom	Member	75,869	16,768	22.1
	Others		34,285	7966	23.2
	Total		616,869	130,886	21.2

Source: European Commission, SERI

¹ Member State since 2013

Remark: only permitted proposals are included (excl. inadmissible, withdrawn, duplicates, not specified); the success rates are according to the number of proposals in the category "mainlist" in relation to all eligible proposals.

Tab. 14: List and budgets of the programmes and research priorities of the 8th European Research Framework Programme (Horizon 2020)

Specific programme	Priority / programme	Abbreviation	Budget (in EUR m)	%	%
I. Excellent Science	European Research Council	ERC	13,095.0	17%	16%
	Future and emerging technologies	FET	2696.0	4%	3%
	Marie Skłodowska-Curie actions	MSCA	6162.0	8%	8%
	European research infrastructures (incl. e-infrastructures)	INFRA	2488.0	3%	3%
Total Excellent Science			24,441.0	32%	30%
II. Industrial Leadership	Leadership in enabling and industrial technologies	LEIT	13,557.0	18%	17%
	Access to risk finance	RISKFINANCE	2842.3	4%	3%
	Innovative SME	SME	616.2	1%	1%
Total Industrial Leadership			17,015.5	22%	21%
III. Societal Challenges	Health	HEALTH	7471.8	10%	9%
	Food, agriculture and aquatic research	FOOD	3851.4	5%	5%
	Energy	ENERGY	5931.2	8%	7%
	Transport	TRANSPORT	6339.4	8%	8%
	Climate and environment	ENV	3081.1	4%	4%
	Inclusive societies	SOCIETY	1309.5	2%	2%
	Secure societies	SECURITY	1694.6	2%	2%
Total Societal Challenges			29,679.0	39%	36%
Spreading excellence and widening participation			816.0	1%	1%
Science with and for society			462.0	1%	1%
European Institute of Innovation and Technology (EIT)			2711.0	4%	3%
Joint Research Centre (without nuclear domain)			1903.0	2%	2%
Total FP8			77,027.5	100%	94%
Euratom programme (2014-2020)	Fission, security and radiation protection, Fusion	Fission+Fusion	2373.0		2%
	ITER	ITER	2915.0		4%
Total Euratom programme			5288.0		6%
Total Horizon 2020			82,315.5		100%

Source: SEC(2014) 357 final, STATEMENT OF ESTIMATES OF THE COMMISSION FOR 2015, (Preparation of the 2015 Draft Budget), Document II, Financial programming 2016, 2020, (Provisional figures), 11.6.2014

Table 15: Number of Temporary Backup Schemes of the Swiss National Science Foundation

Field of study	SNSF Starting Grants	%	SNSF Consolidator Grants	%	Total	%
Social Sciences and Humanities	5	19%	4	19%	9	19%
Physical and Engineering Sciences	10	37%	6	29%	16	33%
Life Sciences	12	44%	11	52%	23	48%
Total	27	100%	21	100%	48	100%

Source: SNSF

Table 16: Number of Swiss participations, coordinations and amount of contributions committed by type of institution under the 8th European Research Framework Programme (Horizon 2020)

Type of institution	Number of participations	%	Of which coordinations	%	Committed contribution (CHF m)	%
EPF Lausanne	34	10.7%	4	26.7%	29.3	17.0%
ETH Zurich	52	16.4%	4	26.7%	31.5	18.3%
EAWAG	2	0.6%	0	0.0%	1.0	0.6%
EMPA	10	3.1%	0	0.0%	6.2	3.6%
PSI	12	3.8%	0	0.0%	4.7	2.7%
WSL	3	0.9%	0	0.0%	0.5	0.3%
Total ETH Domain	113	35.5%	8	53.3%	73.2	42.5%
University of Basel	6	1.9%	0	0.0%	3.2	1.8%
University of Bern	12	3.8%	3	20.0%	10.5	6.1%
University of Geneva	11	3.5%	0	0.0%	3.9	2.3%
University of Lausanne	10	3.1%	0	0.0%	8.7	5.0%
University of Neuchâtel	1	0.3%	0	0.0%	1.0	0.6%
University of St. Gallen	1	0.3%	0	0.0%	0.9	0.5%
University of Lugano	1	0.3%	0	0.0%	0.6	0.3%
University of Zurich	12	3.8%	1	6.7%	7.1	4.1%
Total universities	54	17.0%	4	26.7%	35.8	20.8%
FHNW	5	1.6%	0	0.0%	2.5	1.4%
FHO	1	0.3%	0	0.0%	0.7	0.4%
SUPSI	6	1.9%	0	0.0%	3.1	1.8%
ZHAW	2	0.6%	0	0.0%	0.5	0.3%
HES-SO	3	0.9%	0	0.0%	1.6	0.9%
Total universities of applied sciences	17	5.3%	0	0.0%	8.5	4.9%
Confederation	4	1.3%	0	0.0%	0.4	0.2%
Cantons and communes	1	0.3%	0	0.0%	0.2	0.1%
Non-profit organisations	36	11.3%	2	13.3%	8.4	4.9%
Industry	38	11.9%	0	0.0%	25.5	14.8%
Small- and medium-sized enterprises	55	17.3%	1	6.7%	20.3	11.8%
Total	318	100.0%	15	100.0%	172.4	100.0%

Source: European Commission, SERI

Table 17: Annual contributions (paid or simulated) from European research framework programmes received by Swiss universities (actual payments, in CHF m)

	EPFL	ETHZ	UNIBAS	UNIBE	UNIGE	UNIL	UNINE	UNISG	UNISI	UZH	Total
2014	2.8	0.0	0.0	0.2	0.0	0.9	0.0	0.0	0.0	0.4	4.3
2015	11.8	15.8	1.6	5.1	2.0	3.5	0.5	0.5	0.3	2.9	43.7
2016	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
2017	6.0	8.4	1.0	2.4	1.2	3.0	0.3	0.3	0.2	1.9	24.5
2018	1.8	3.6	0.3	1.0	0.2	0.1	0.2	0.2	0.0	0.6	8.0
2019	3.0	2.3	0.3	0.5	0.5	0.9	0.0	0.0	0.1	0.7	8.4
2020	2.0	1.3	0.0	1.2	0.0	0.4	0.0	0.0	0.0	0.0	5.0
Total	29.3	31.5	3.2	10.5	3.9	8.7	1.0	0.9	0.6	6.5	96.0

Source: European Commission, SERI

Note: The University of Lucerne and Swiss universities of applied sciences are not shown here, due to their limited contributions. The actual payments of grants under previous FP are estimated by evenly distributing committed funding over project durations.

Table 18: Participations and committed contributions by research programme and priority for the 8th European Research Framework Programme (Horizon 2020)

Programme / priority	Abbreviation	Number of Swiss participations		Total participations		Committed contributions for Swiss institutions (CHF m)		Total committed contributions (CHF m)	
Excellent Science		87	27.4%	5206	28.7%	48.4	28.1%	2566.8	32.0%
European Research Council	ERC	8	2.5%	792	4.4%	13.4	7.8%	1122.6	14.0%
Future and emerging technologies	FET	18	5.7%	443	2.4%	7.8	4.5%	233.5	2.9%
Marie Skłodowska-Curie actions	MSCA	40	12.6%	3 154	17.4%	20.9	12.1%	907.8	11.3%
European research infrastructures (incl. e-infrastructures)	INFRA	21	6.6%	817	4.5%	6.4	3.7%	302.9	3.8%
Industrial Leadership		95	29.9%	4797	26.4%	57.2	33.2%	1850.4	23.1%
Industrial Leadership - cross-theme	P2-OTHER	3	0.9%	126	0.7%	1.0	0.6%	39.4	0.5%
Information and Communication Technologies	ICT	53	16.7%	2448	13.5%	35.0	20.3%	1065.4	13.3%

Programme / priority	Abbreviation	Swiss participations		Total participations		Committed contributions for Swiss institutions (CHF m)		Total committed contributions (CHF m)	
Nanotechnologies, Photonics, Advanced Materials, Advanced Manufacturing and Processing, and Biotechnology	NMBP	26	8.2%	1172	6.5%	17.7	10.3%	553.5	6,9%
Space	SPACE	11	3.5%	665	3.7%	3.2	1.9%	165.8	2,1%
Access to risk finance	RISKFINANCE	1	0.3%	20	0.1%	0.1	0.1%	5.5	0,1%
Innovative SME	SME	1	0.3%	366	2.0%	0.2	0.1%	20.8	0,3%
Societal Challenges		115	36.2%	7428	40.9%	56.0	32.5%	2902.9	36.2%
Health	HEALTH	35	11.0%	1553	8.6%	23.9	13.9%	720.0	9,0%
Food, agriculture and aquatic research	FOOD	17	5.3%	1173	6.5%	5.5	3.2%	362.9	4,5%
Energy	ENERGY	20	6.3%	1564	8.6%	6.6	3.8%	688.4	8,6%
Transport	TRANSPORT	19	6.0%	1510	8.3%	11.0	6.4%	655.1	8,2%
Climate and environment	ENV	9	2.8%	545	3.0%	3.0	1.7%	138.0	1,7%
Inclusive societies	SOCIETY	11	3.5%	492	2.7%	3.6	2.1%	125.7	1,6%
Secure societies	SECURITY	4	1.3%	591	3.3%	2.5	1.4%	212.8	2,7%
Spreading excellence and widening participation		0	0.0%	162	0.9%	0.0	0.0%	47.3	0.6%
Spreading excellence and widening participation	WIDESPREAD	0	0.0%	162	0.9%	0.0	0.0%	47.3	0,6%
Science with and for Society		6	1.9%	204	1.1%	0.0	0.0%	35.6	0.4%
Science with and for Society	SWAFS	6	1.9%	204	1.1%	0.0	0.0%	35.6	0,4%
Euratom		15	4.7%	361	2.0%	10.8	6.2%	615.7	7.7%
Euratom programme (2014-2020)	Euratom	15	4.7%	361	2.0%	10.8	6.2%	615.7	7,7%
Total		318	100.0%	18,158	100.0%	172.4	100.0%	8018.7	100.0%

Source: European Commission, SERI

Remark: Swiss institutions are actually not admitted to the programme areas "access to risk finance" and "Innovation in SMEs". However, the EC can permit exceptions for projects that are considered particularly worthy of support. This is the case in both areas for one project each.


Table 19: Swiss participation and success indices by research programme and priority in the 8th European Research Framework Programme (Horizon 2020)

Programme / priority		Number of Swiss proposals	Proportion of Swiss proposals by priority	Proportion of proposals by priority, all countries	Swiss participation index	Success rates of Swiss proposals	Success rates of proposals, all countries	Swiss success index
CROSST	Cross-cutting activities (digital ERA)	1	0.0%	0.0%	1.54	100.0%	100.0%	1.00
Euratom	Euratom	27	1.1%	0.7%	1.68	55.6%	42.1%	1.32
ERC	European Research Council	134	5.6%	6.8%	0.83	22.4%	11.7%	1.92
FET	Future and Emerging Technologies	204	8.5%	4.3%	1.99	17.2%	12.4%	1.38
INFRA	Research Infrastructures	138	5.8%	3.2%	1.81	30.4%	27.2%	1.12
MSCA	Marie Skłodowska-Curie actions	596	24.9%	23.2%	1.08	10.9%	12.9%	0.85
ICT	Information and Communication Technologies	297	12.4%	13.2%	0.94	16.8%	13.6%	1.24
NMP	Nanosciences, Nanotechnologies, Materials and New Production Technologies	223	9.3%	9.1%	1.02	18.4%	12.8%	1.43
P2-OTHER	Pillar II - Others	37	1.5%	1.4%	1.10	16.2%	14.7%	1.11
RISKFINANCE	Access to risk finance	5	0.2%	0.2%	0.98	20.0%	6.7%	2.99
SME	SME	1	0.0%	0.5%	0.09	100.0%	87.2%	1.15
SPACE	Space	43	1.8%	1.9%	0.93	25.6%	22.8%	1.12
SWAFS	Science with and for Society	27	1.1%	1.5%	0.74	29.6%	12.7%	2.33
ENERGY	Energy	113		7.6%	0.62	17.7%	14.5%	1.22
ENV	Environment (including Climate Change)	24	1.0%	2.0%	0.51	37.5%	20.0%	1.87
FOOD	Food, agriculture and aquatic research	75	3.1%	4.2%	0.75	25.3%	20.2%	1.25
HEALTH	Health	265	11.1%	8.7%	1.28	14.0%	12.7%	1.10
SECURITY	Security	62	2.6%	3.8%	0.68	9.7%	10.4%	0.93
SOCIETY	Social sciences, economics and humanities	51	2.1%	3.2%	0.67	19.6%	9.9%	1.99
TRANSPORT	Transport (including Aeronautics)	62	2.6%	4.0%	0.64	30.6%	27.3%	1.12
WIDESPREAD	Spreading excellence and widening participation	6	0.3%	0.6%	0.44	0.0%	17.7%	0.00
Total		2391	100.0%	100.0%	1.00	17.8%	15.1%	1.18

Source: European Commission, SERI


Remark: only evaluated proposals are included (excl. inadmissible, withdrawn, duplicates, not specified); the success rates correspond to the number of proposals in the category "mainlist" in relation to all eligible proposals; all countries = incl. Switzerland. The ERC calls StG-2014 and CoG ERC-2014 have been excluded from the results of Switzerland because Switzerland was not eligible.

Table 20: Number of participations and coordinations of projects and contributions committed, by country in the 8th European Research Framework Programme (Horizon 2020)

Country		Status	Number of participations		Of which coordinations		Committed contributions (in CHF m)	
AL	Albania	Associated	4	0.0%	0	0.0%	0.1	0.0%
AT	Austria	Member	504	2.8%	111	2.6%	218.8	2.7%
BA	Bosnia and Herzegovina	Associated	6	0.0%	1	0.0%	0.3	0.0%
BE	Belgium	Member	790	4.4%	133	3.1%	331.0	4.1%
BG	Bulgaria	Member	101	0.6%	8	0.2%	12.1	0.2%
	Switzerland	Partially associated	318	1.8%	15	0.3%	172.4	2.2%
CY	Cyprus	Member	90	0.5%	21	0.5%	27.9	0.3%
CZ	Czech Republic	Member	206	1.1%	19	0.4%	50.4	0.6%
DE	Germany	Member	2436	13.4%	532	12.3%	1648.7	20.6%
DK	Denmark	Member	408	2.2%	145	3.4%	186.3	2.3%
EE	Estonia	Member	108	0.6%	30	0.7%	29.1	0.4%
EL	Greece	Member	532	2.9%	85	2.0%	176.5	2.2%
ES	Spain	Member	1823	10.0%	518	12.0%	655.2	8.2%
FI	Finland	Member	389	2.1%	91	2.1%	171.6	2.1%
FO	Faroe Islands	Associated	2	0.0%	0	0.0%	0.6	0.0%
FR	France	Member	1651	9.1%	419	9.7%	840.8	10.5%
HR	Croatia	Member	81	0.4%	8	0.2%	14.9	0.2%
HU	Hungary	Member	171	0.9%	29	0.7%	41.0	0.5%
IE	Ireland	Member	318	1.8%	110	2.5%	148.9	1.9%
IL	Israel	Associated	233	1.3%	90	2.1%	130.5	1.6%
IS	Iceland	Associated	41	0.2%	10	0.2%	13.2	0.2%
IT	Italy	Member	1663	9.2%	353	8.2%	623.0	7.8%
LT	Lithuania	Member	51	0.3%	8	0.2%	6.7	0.1%
LU	Luxembourg	Member	73	0.4%	11	0.3%	24.2	0.3%
LV	Latvia	Member	61	0.3%	6	0.1%	11.1	0.1%
MD	Moldova (Republic of)	Associated	7	0.0%	0	0.0%	0.3	0.0%
ME	Montenegro	Associated	5	0.0%	1	0.0%	0.1	0.0%
MK	Macedonia (FYROM)	Associated	16	0.1%	2	0.0%	0.7	0.0%
MT	Malta	Member	29	0.2%	3	0.1%	3.1	0.0%
NL	Netherlands	Member	1190	6.6%	315	7.3%	594.2	7.4%
NO	Norway	Associated	253	1.4%	60	1.4%	129.8	1.6%
PL	Poland	Member	309	1.7%	35	0.8%	74.3	0.9%
PT	Portugal	Member	387	2.1%	63	1.5%	128.9	1.6%
RO	Romania	Member	162	0.9%	11	0.3%	32.6	0.4%
RS	Serbia	Associated	58	0.3%	8	0.2%	5.7	0.1%
SE	Sweden	Member	568	3.1%	104	2.4%	279.0	3.5%
SI	Slovenia	Member	172	0.9%	24	0.6%	41.2	0.5%
SK	Slovakia	Member	80	0.4%	9	0.2%	10.9	0.1%
TR	Turkey	Associated	104	0.6%	26	0.6%	27.1	0.3%
UK	United Kingdom	Member	2431	13.4%	892	20.6%	1109.1	13.8%
	Others		327	1.8%	14	0.3%	46.2	0.6%
	Total		18,158	100.0%	4320	100.0%	8018.5	100.0%

Source: European Commission, SERI

Table 21: Success rates by country in the 8th European Research Framework Programme (Horizon 2020)

Country		Status	Number of proposals evaluated	Number of proposals awarded funding	Success rate
AL	Albania	Associated	51	5	9.8
AT	Austria	Member	3598	596	16.6
BA	Bosnia and Herzegovina	Associated	57	8	14.0
BE	Belgium	Member	5133	889	17.3
BG	Bulgaria	Member	890	105	11.8
	Switzerland	Partially associated	2399	427	17.8
CY	Cyprus	Member	805	94	11.7
CZ	Czech Republic	Member	1561	233	14.9
DE	Germany	Member	17,134	2832	16.5
DK	Denmark	Member	3194	470	14.7
EE	Estonia	Member	700	115	16.4
EL	Greece	Member	4517	576	12.8
ES	Spain	Member	14,650	2056	14.0
FI	Finland	Member	3140	424	13.5
FO	Faroe Islands	Associated	16	3	18.8
FR	France	Member	10,999	1928	17.5
HR	Croatia	Member	717	87	12.1
HU	Hungary	Member	1817	207	11.4
IE	Ireland	Member	2251	343	15.2
IL	Israel	Associated	1795	271	15.1
IS	Iceland	Associated	210	44	21.0
IT	Italy	Member	15,126	1845	12.2
LT	Lithuania	Member	485	58	12.0
LU	Luxembourg	Member	438	73	16.7
LV	Latvia	Member	371	64	17.3
MD	Moldova (Republic of)	Associated	62	10	16.1
ME	Montenegro	Associated	33	8	24.2
MK	Macedonia (FYROM)	Associated	125	18	14.4
MT	Malta	Member	224	36	16.1
NL	Netherlands	Member	8245	1360	16.5
NO	Norway	Associated	2031	312	15.4
PL	Poland	Member	2624	366	13.9
PT	Portugal	Member	3470	442	12.7
RO	Romania	Member	1561	196	12.6
RS	Serbia	Associated	560	69	12.3
SE	Sweden	Member	4178	644	15.4
SI	Slovenia	Member	1597	182	11.4
SK	Slovakia	Member	695	88	12.7
TR	Turkey	Associated	1139	131	11.5
UK	United Kingdom	Member	17,668	2776	15.7
	Others		3484	649	18.6
	Total		139,750	21,040	15.1

Source: European Commission, SERI

Remark: only evaluated proposals are included (excl. inadmissible, withdrawn, duplicates, not specified); the success rates correspond to the number of proposals in the category "mainlist" in relation to all eligible proposals.

Table 22: Participations and committed contributions by source of funding for the 8th European Research Framework Programme (Horizon 2020)

Programme / priorities	Number of Swiss participations with EU funding	Committed contributions for Swiss institutions (CHF m) with EU funding		Number of Swiss participations with Swiss funding	Committed contributions for Swiss institutions (CHF m) with Swiss funding		Number of Swiss participations total	Committed contributions for Swiss institutions (CHF m) total		Average costs per participation (CHF m)
Excellent Science	25	24.1	75.9%	58	24.2	17.3%	87	48.4	28.1%	
ERC	8	13.4	42.0%		0.0	0.0%	8	13.4	7.8%	1,67
FET	13	5.2	16.3%	5	2.6	1.8%	18	7.8	4.5%	0,43
MSCA	3	4.4	13.8%	37	16.5	11.7%	40	20.9	12.1%	0,52
INFRA	1	1.2	3.8%	16	5.2	3.7%	21	6.4	3.7%	0,30
Industrial Leadership	3	1.1	3.5%	84	56.1	39.9%	95	57.2	33.2%	
P2-OTHER			0.0%	3	1.0	0.7%	3	1.0	0.6%	0,34
ICT			0.0%	50	35.0	24.9%	53	35.0	20.3%	0,66
NMP			0.0%	24	17.7	12.6%	26	17.7	10.3%	0,68
SPACE	2	0.9	2.9%	6	2.3	1.6%	11	3.2	1.9%	0,29
RISKFINANCE			0.0%	1	0.1	0.1%	1	0.1	0.1%	0,11
SME	1	0.2	0.5%		0.0	0.0%	1	0.2	0.1%	0,17
Societal Challenges	0	0.0	0.0%	91	56.0	39.8%	115	56.0	32.5%	
HEALTH			0.0%	30	23.9	17.0%	35	23.9	13.9%	0,68
FOOD			0.0%	13	5.5	3.9%	17	5.5	3.2%	0,32
ENERGY			0.0%	13	6.6	4.7%	20	6.6	3.8%	0,33
TRANSPORT			0.0%	15	11.0	7.8%	19	11.0	6.4%	0,58
ENV			0.0%	8	3.0	2.1%	9	3.0	1.7%	0,33
SOCIETY			0.0%	8	3.6	2.6%	11	3.6	2.1%	0,33
SECURITY			0.0%	4	2.5	1.8%	4	2.5	1.4%	0,62
Spreading excellence and widening participation	0	0.0	0.0%	0	0.0	0.0%	0	0.0	0.0%	0.00
WIDESPREAD		0.0	0.0%		0.0	0.0%	0	0.0	0.0%	0,00
Science with and for Society	0	0.0	0.0%	0	0.0	0.0%	6	0.0	0.0%	0.00
SWAFS		0.0	0.0%		0.0	0.0%	6	0.0	0.0%	0,00
Euratom	8	6.6	20.7%	9	4.2	3.0%	15	10.8	6.2%	
Euratom	8	6.6	20.7%	9	4.2	3.0%	15	10.8	6.2%	0,72
Total	36	31.8	100.0%	242	140.5	100.0%	318	172.4	100.0%	0.54
% contributions		18.5			81.5			100.0		
% participations	11.3			76.1			100.0			

Source: European Commission, SERI

Remark: 43 participants have not received any contributions and 3 (in Euratom) receive contributions from both the EU and Switzerland. Thus, the total number of Swiss participations cannot be entirely and unambiguously assigned to the two funding sources.

Table 23: Swiss project proposals, funded projects and success rates for FP7 (2007-2013), according to Article 185 of the Treaty on the Functioning of the European Union (TFEU)

	AAL	Eurostars	EMPR	Total
Number of project proposals with a Swiss partner	138	364	59	561
Number of funded projects with a Swiss partner	51	97	35	183
Success rate in %	37%	27%	59%	100%
National funding (CHF)	18,809,197	35,235,933	0	54,045,130
EU co-funding (CHF)	11,789,608	6,899,373	8,471,000	27,159,981
Self-financing (CHF)	32,343,962	47,462,675	8,369,000	88,175,637
Total funding (CHF)	62,942,767	89,597,981	16,840,000	169,380,748
Public research organisations / universities	10	57	140	207
SMEs	44	93		137
Partners from large-scale enterprises	4			4
End-user organisations	21	2		23
International organisations / associations				0
Others				0
Total number of project partners	79	152	140	371

Source: European Commission, SERI

Table 24: Number of Swiss project partners and EU contributions for FP7 (2007-2013), according to Article 187 of the Treaty on the Functioning of the European Union (TFEU)

Number of Swiss partners	ENIAC	FCH	IMI	CS	Total	%
ETH Domain	1	20	3	3	27	14.3%
Universities	0	0	23	0	23	12.2%
Universities of applied sciences	0	4	0	2	6	3.2%
Cantons and communes	0	2	0	0	2	1.1%
Non-profit organisations	0	0	8	0	8	4.2%
Industry	4	3	52	9	68	36.0%
SMEs	3	31	9	11	54	28.6%
Participation of SMEs in %	38%	51%	9%	44%	29%	0.2%
Total	8	61	95	25	189	100.0%
EU contributions to Swiss project partners	ENIAC	FCH	IMI	CS	Total	%
ETH Domain	104,931	6,417,610	2,140,218	170,753	8,833,510	12.4%
Universities	0	0	25,810,533	0	25,810,533	36.1%
Universities of applied sciences	0	943,024	0	566,948	1,509,972	2.1%
Cantons and communes	0	66,479	0	0	66,479	0.1%
Non-profit organisations	0	198,603	3,114,101	0	3,312,704	4.6%
Industry	349,331	610,333	0	2,392,210	3,351,875	4.7%
SMEs	249,991	19,295,195	5,095,855	3,899,150	28,540,192	40.0%
Total	704,254	27,531,244	36,160,707	7,029,061	71,425,265	100.0%

Source: European Commission, SERI

Table 25: Participations and committed contributions in the programme nuclear fission of the 7th European Research Framework Programme, by activity

Activity	Number of Swiss participations		Total participations		Committed contributions for Swiss institutions (CHF m)		Total committed contributions (CHF m)	
Radioactive Waste	18	31.0	325	16.6	5.3	29.2	84.9	17.8
Reactors Systems	27	46.6	760	38.8	8.8	48.5	189.4	39.6
Radiation Protection	4	6.9	348	17.8	0.9	5.1	113.4	23.7
Infrastructures	3	5.2	117	6.0	1.0	5.2	33.3	7.0
Mobility and Training	3	5.2	166	8.5	0.4	2.0	16.4	3.4
Cross-cutting Actions	1	1.7	187	9.6	1.1	5.9	32.1	6.7
Cooperation with Third Countries	1	1.7	51	2.6	0.6	3.1	7.1	1.5
Others	1	1.7	4	0.2	0.2	1.0	1.6	0.3
Total	58	100.0	1958	100.0	18.2	100.0	478.2	100.0

Source: European Commission, SERI

Table 26: Participations and committed contributions in the programme nuclear fission of the 8th European Research Framework Programme (Horizon 2020), by activity

Activity	Number of Swiss participations		Total participations		Committed contributions for Swiss institutions (CHF m)		Total committed contributions (CHF m)	
Safe nuclear systems	5	35.7	103	31.0	1.2	23.9	25.6	27.6
Radioactive Waste	8	57.1	98	29.5	3.6	71.0	20.4	22.0
Radiation Protection		0.0	32	9.6		0.0	20.7	22.3
Cross-cutting Actions	1	7.1	32	9.6	0.3	5.1	16.0	17.3
Training and Society		0.0	67	20.2		0.0	9.9	10.7
Total	14	100.0	332	100.0	5.1	100.0	92.7	100.0

Source: European Commission, SERI