



Quality, impact and renewal in
international cooperation –
Academy of Finland international policy
for 2017–2021

BACKGROUND MEMORANDUM

23 February 2017



SUOMEN AKATEMIA

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1 Introduction

In accordance with the Act on the Academy of Finland, the Academy of Finland grants funding for scientific research, researcher training and development of research capabilities. Funding is granted based on open competition. The Academy serves as an expert body in matters of science policy, developing international scientific cooperation and carrying out any other expert duties appointed to it with regard to science policy. In the new strategy for the Academy of Finland, advancing the quality and impact of scientific research and renewing science have been specified as key goals for the Academy (see <http://www.aka.fi/en/research-and-science-policy/strategy>). Together with the Administration Office, the research councils, the Finnish Research Infrastructure Committee and the Strategic Research Council at the Academy play a key role in promoting the internationality of research.

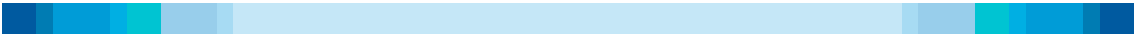
Research practices and, consequently, the Academy's operating environment are in the process of a radical change. This change is being brought about by factors such as new methods, cross-disciplinary approaches, digitalisation and the open science movement, which are making publications and materials more accessible. At the same time, scientific competition is becoming more intense among research teams, organisations and nations alike. Society's expectations on research have increased: research results are expected to provide answers to social challenges, and more results are being expected in return for investments in research activities. In addition to these global trends, changes specific to Finland include the levelling out of the long-standing growth of university and research funding and significant structural change in the university and research institution system, which has also led to stronger autonomy for and profiling of universities. The State of Scientific Research in Finland review, published at the end of 2016, demonstrates that the level of Finnish science has improved slightly over the past decade, but many OECD countries have achieved greater and faster growth (see www.aka.fi/en/research-and-science-policy/state-of-scientific-research).

According to the Academy's strategy, the Academy of Finland's activities for the promotion of international engagement and cooperation shall contribute to the quality and impact of research and the renewal of science. In drawing up its international policy, the Academy sought to answer the following questions:

- Why should international scientific engagement and cooperation be promoted?
- In what roles could the Academy best support international engagement and cooperation in Finnish research, and what is the Academy's role in relation to other operators in the field of R&D?
- Which measures taken by the Academy, within the framework of its role, would be the most efficient and effective in striving for or maintaining an international level of quality in Finnish research?
- How should the Academy prioritise its various roles, objectives and activities?

Preparation work for the policy was begun in the spring of 2016. The work entailed discussions in various internal workshops and the research councils, the Research Infrastructure Committee and the Strategic Research Council. The Academy also consulted its stakeholders and drew up a stakeholder survey, the results of which are presented in this background memorandum. The draft policy was discussed in a stakeholder seminar held on 1 February 2017 for a broad group of researchers and research organisation management as well as representatives from ministries, other funding organisations and other scientific organisations.

The purpose of this background memorandum is to comprehensively illustrate the Academy's roles and activities for the promotion of international engagement and



cooperation in research. The stakeholder survey was intended to collect information on how researchers, research organisations and other stakeholders view the roles of the Academy and the impact of its activities now and in the light of future needs.

The time span of the international policy is 2017–2021. The policy will be discussed by the Academy Board on 23 February 2017. It will be followed by an action plan for the same period.

2 The Academy's roles in the promotion of international research cooperation

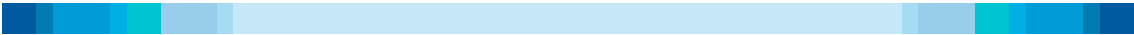
The Academy of Finland supports international engagement and cooperation in research in many roles. Five roles were identified during the preparation of the policy, the most significant of which is **the Academy as a provider of funding for research and international cooperation and mobility**. Four additional roles were identified: **a supporter of international funding applications, an advocate for international forums, a producer of knowledge and a promoter of Finnish visibility, global responsibility and international cooperation**. The preparation of the policy also sought to assess the significance of these roles with regard to scientific cooperation, for example, through the formulation of future scenarios and the stakeholder survey, along with the resources required for the activities entailed by the roles and the target groups and the impact of these activities (for more details on the stakeholder survey, see Chapter 4). Many of the Academy's activities for the promotion of international engagement and cooperation (see Chapter 3 for more details) extend across multiple roles. The roles and activities are listed in the table in Appendix 1. An estimate of resources required for the activities is provided in Appendix 2.

2.1 The Academy funds research, researchers, networks and research environments

In supporting international engagement and cooperation, the Academy of Finland's role is most significant in funding research, researchers, networks and research environments. All the Academy's "basic" funding instruments – Academy Project funding and career funding for researchers, along with the Centres for Excellence and Academy Programmes – enable the international mobility and cooperation of researchers. These funding schemes support international engagement and cooperation in a manner chosen by researchers and research teams and in the countries most appropriate for each individual project. In 2016, these schemes represented EUR 271 million or approximately 65 per cent of all funding granted by the Academy. It has been estimated that these instruments were used to support international engagement and cooperation with an average of EUR 61 million or 25 per cent of all funding each year in 2014–2016. This percentage was calculated by reviewing the percentage of foreign researchers working with Academy funding and the proportions of travel expenses and working months spent abroad (see Chapter 3.1 and Appendix 2).

The Academy's newest forms of funding – strategic research programmes, competitive funding to strengthen university research profiles and funding for research infrastructures – support international engagement and cooperation in science through multidisciplinary research, cooperation and development of research environments. Correspondingly, an estimated EUR 26.5 million (25%) of funding granted for strategic research programmes and the strengthening of university research profiles was spent on supporting international engagement and cooperation each year in 2015–2016. The average volume of national matching funds granted by the Strategic Research Council for EU-funded projects was EUR 3.4 million. An estimated 90 per cent or roughly EUR 16.7 million of funding granted by the Finnish Research Infrastructure Committee was spent on the promotion of international engagement in 2014–2016. The average annual amount of international infrastructure membership fees paid by the Academy was EUR 19.5 million.

In addition to this, the Academy offers various specific instruments for the promotion of international engagement and cooperation, most frequently involving



cooperation with research funders from other countries. Such instruments include the ERA-NET and NordForsk research programmes, bilateral funding calls and mobility grants. In addition to thematic restrictions, these instruments include conditions related to the form and directions of international cooperation and mobility. The average annual amount of funding spent on these instruments was EUR 14.1 million in 2014–2016.

The Academy receives approximately 4,000 funding applications each year. The scientific review of the applications is carried out by expert panels or individual experts recruited by the Administration Office. In practice, all experts employed for these reviews are recruited from abroad, except for strategic research programme panels, which also include Finnish members. The impartiality of each expert is carefully verified. The funding is decided by the research councils, subcommittees instituted by the Academy Board, the Finnish Research Infrastructure Committee and the Strategic Research Council. These bodies make their funding decisions based on recommendations made by the expert panels.

2.2 The Academy supports international funding applications

The Academy of Finland supports applications for international funding in various ways. The Academy's project and research career funding instruments allow for preparing applications for international funding related to the research plan during the project. The matching funds granted by the Strategic Research Council also encourage applying for EU funding.

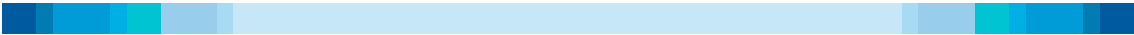
In addition to this, the Academy supports applying for EU funding through significant expert resources. Per the national division of duties, the Academy and its national contact persons provide support especially for the research services of research organisations in funding applications under the first and third pillars of the Horizon 2020 programme. The Academy arranges interview training for applicants who reach the second round in European Research Council (ERC) calls.

2.3 The Academy promotes Finnish research opportunities in international forums

The Academy of Finland is an active advocate in the EU and other international organisations, including the NordForsk organisation instituted by the Nordic Council of Ministers, the Organisation for Economic Co-operation and Development OECD, the European COST funding organisation for research and innovation networks and a variety of international infrastructures, such as the European Organization for Nuclear Research CERN and the European Molecular Biology Laboratory EMBL.

Measured in FTEs, the focus of the Academy's advocacy is in the programme committees of the EU Framework Programme for Research and Innovation. Academy officials serve as delegates and expert members in the programme committees of the framework programme's first and third pillars and in the programme's strategic configuration responsible for general policies. Many of the experts are simultaneously national contact persons for the Horizon programme. The key purpose of the programme committees is preparing work programmes and monitoring their realisation. Naturally, Finnish committee members strive to make the programmes and calls as relevant as possible for the Finnish scientific community.

The Academy's advocacy in EU R&D policy is not limited to the framework programme. In cooperation with the Ministry of Education, Science and Culture and the other sector ministries, the Academy seeks to influence the overall direction of the European Research Area (ERA) and EU R&D instruments. For



example, working in European and other international infrastructure organisations and the Joint Programming Initiatives (JPI) of Member States is vital since significant plans and decisions that have an impact on the Finnish research environment are made within these frameworks.

The Academy also works with numerous other international organisations and represents the Finnish scientific community, either alone or with other national operators. The Academy is also a member of Science Europe, an association of research funding organisations that promotes the collective interests of research and research funding in the EU.

2.4 The Academy produces knowledge and promotes the visibility of Finnish research

In practically all funding granted by the Academy of Finland, the projects that receive funding are chosen based on the assessment of international reviewers. The Academy receives approximately 4,000 applications each year, and these are evaluated by nearly 1,000 reviewers of whom 95 per cent are recruited from outside Finland. This procedure ensures that the funded projects are of international quality or as close to it as possible. Rejected applicants receive valuable feedback on their research. At the same time, the procedure provides extensive visibility to Finnish research.

The biannual State of Scientific Research in Finland reviews provide a comprehensive picture of the level of Finnish research in an international comparison. The drafting work of the reviews produces materials that support the development work of universities and research institutes and consolidates the knowledge base available for science policy makers. At present, publications, scientific impact and publication cooperation are mainly examined through bibliometric methods that enable international comparison.

2.5 The Academy promotes global responsibility and international cooperation

The Academy of Finland's roles in promoting international engagement and cooperation include global responsibility and the promotion of science diplomacy. Activities that fall under this role, including the visits of international delegations to Finland and Finnish visits abroad, are frequently carried out in cooperation with the Ministry of Education, Science and Culture, but also with other ministries where appropriate. Other activities related to this role include bilateral calls for the promotion of research and mobility with countries outside the EU and development research funding implemented in cooperation with the Ministry for Foreign Affairs. The Academy also participates in funding international infrastructures and organisations with their roots in the promotion of peaceful international cooperation through science (e.g. CERN and the International Institute for Applied Systems Analysis IIASA).

Participation in joint programming of EU Member States is also a part of this role. At present, the Academy is participating in six JPI initiatives aimed at resolving global challenges and also challenges relevant to developing countries through research and innovations.

3 Academy's activities for the promotion of international research engagement and cooperation

As discussed above, all project, research career and programme funding granted by the Academy of Finland supports international engagement and cooperation in research. The Academy also performs various activities for the promotion of international cooperation, advocacy and expertise. This chapter presents the Academy's activities for the promotion of international research engagement and cooperation in more detail. The presentation of each activity includes a description of its background (e.g. whether the activity is an appointed duty), key actors and their duties, partners outside the Academy and the resourcing of the activity.

3.1 Project and research career funding

The award decisions for project and research career funding are made by the Academy's research councils based on international reviews. One of the seven review criteria is international and national research collaborations and researcher mobility (see Chapter 2.1 in the Tutkimusrahoituksen perusteet document (*Grounds for research funding*, in Finnish), www.aka.fi/fi/arviointi-ja-paatokset/paatosaikataulut/rahoituspaatokset). A mobility plan for the funding period must be presented when applying for funding. These instruments are completely researcher-driven, which means that the directions and forms of international engagement and cooperation included in the project are completely up to the researchers and research teams. Foreign researchers can be hired for the projects. Foreign researchers are also free to apply for funding from the Academy if they can demonstrate a strong connection with a Finnish research environment.

3.1.1 Academy Project funding

An Academy Project is built around a scientifically sound and ambitious research plan that is implemented by a high-quality research team or consortium of research teams. Academy Projects promote the quality and scientific and other impact of research, renewal of science and diversity. The objective is to achieve the highest international standard of research possible, scientific breakthroughs and research cooperation with the best international teams. Funding is primarily granted to teams consisting of postdoctoral researchers. The funding can be used for international activities necessary for the research project, such as conferences and meetings, visits or long-term mobility, researcher training abroad and the preparation of international projects. Foreign researchers can be hired for the projects.

3.1.2 Research career funding

The objective of personal funding granted to researchers is to promote the development of a high-level body of researchers in various fields, support the qualification and career advancement of researchers and increase the attractiveness of the research profession. The Academy provides funding for three fixed-term posts: Academy Professor, Academy Research Fellow and Postdoctoral Researcher. Like Academy Projects, these posts provide extensive opportunities for international engagement and cooperation.

Persons appointed to the post of **Academy Professor** are internationally leading-edge researchers and recognised experts in their field who are expected to have great scientific impact on the scientific community and on society at large.

Academy Professors pursue their research plan, supervise their team and provide guidance to junior researchers.

Posts as **Academy Research Fellows** are given to the best and most experienced researchers for independent scientific work. The purpose of the post is to develop their skills in academic leadership and to facilitate their establishment as independent researchers.

Postdoctoral Researchers are promising researchers who have recently completed their doctoral degree and use their funding to gain competence for demanding researcher or expert positions.

As of September 2016, mobility has been required of the recipients of Academy Research Fellow and Postdoctoral Researcher funding. The mobility requirement is fulfilled if the researcher applies for funding for a different research environment than the one in which he or she obtained his or her doctoral degree. Funding can also be applied for the same research environment if the applicant has, after obtaining the doctoral degree, worked elsewhere for a minimum of six months by the application deadline. This research environment can be located in Finland or abroad. The objective is to advance the researcher's personal networks and renewal and to improve their chances for gaining sought-after research or expert positions.

3.1.3 Statistics on the promotion of international engagement through Academy Projects and research career funding

The statistics presented in this chapter provide more detailed information on how the above-mentioned funding instruments support international engagement and cooperation. Table 1 is based on the reports of projects and research positions concluded in 2015. The table illustrates that approximately 60% of reports mention mobility during the funding period. A total of 70% of Postdoctoral Researchers refer to mobility in their reports. Table 2, on the other hand, illustrates that Centres of Excellence hire a greater percentage of foreign researchers. The information based on project reports is indicative. The reporting system is currently in the process of development.

Table 3, based on the Academy's funding statistics, indicates the percentages of Finnish and foreign applicants and funding recipients in the above-mentioned basic funding instruments of the Academy. The nationalities of hired personnel have also been specified for the Centre of Excellence instrument (see section 3.2.1 more details). The key finding is that researchers of other nationalities apply for and are granted funding in roughly the same ratio in these forms of funding.

Table 1. Mobility reported in project reports for 2015 by month and individual: Postdoctoral Researcher, Academy Research Fellow, Academy Project, targeted Academy Project. Source: Academy of Finland funding database.

| Purpose | Mobility mentioned in reports, percentage | | To Finland | | From Finland | | Within Finland | | Total | |
|--------------------------|---|-----|------------|---------|--------------|---------|----------------|---------|--------|---------|
| | % | N | Months | Persons | Months | Persons | Months | Persons | Months | Persons |
| Postdoctoral Researcher | 70 | 147 | 5 | 1 | 709 | 155 | 76 | 18 | 791 | 174 |
| Academy Research Fellow | 56 | 77 | 205 | 7 | 280 | 91 | 5 | 4 | 489 | 102 |
| Academy Project | 57 | 221 | 435 | 53 | 1,092 | 273 | 127 | 19 | 1,654 | 345 |
| Targeted Academy Project | 56 | 25 | 16 | 9 | 59 | 29 | 12 | 2 | 87 | 40 |

| | | | | | | | | | | |
|-------|----|-----|-----|----|-------|-----|-----|----|-------|-----|
| Total | 61 | 470 | 660 | 70 | 2,140 | 548 | 220 | 43 | 3,020 | 661 |
|-------|----|-----|-----|----|-------|-----|-----|----|-------|-----|

Table 2. Personnel hired with Academy funding by nationality (major groups): Academy Project, Academy Research Fellow, Centre of Excellence, Postdoctoral Researcher. Reports for 2011–2016, i.e. personnel employed in 2007–2015. Source: Academy of Finland funding database.

| | Academy Project personnel | | Academy Research Fellow | | Centre of Excellence | | Postdoctoral Researcher | | Research personnel, total | | |
|----------------------------------|---------------------------|-----|-------------------------|-----|----------------------|-----|-------------------------|-----|---------------------------|-----|------------------------|
| Nationality | N | % | N | % | N | % | N | % | N | % | % of foreign nationals |
| Finland | 11,126 | 80% | 1,492 | 78% | 2,541 | 71% | 1,260 | 82% | 16,419 | 79% | |
| Russia | 328 | 2% | 57 | 3% | 112 | 3% | 24 | 2% | 521 | 2% | 12% |
| China | 302 | 2% | 40 | 2% | 112 | 3% | 19 | 1% | 473 | 2% | 11% |
| India | 215 | 2% | 21 | 1% | 53 | 1% | 14 | 1% | 303 | 1% | 7% |
| Germany | 139 | 1% | 20 | 1% | 83 | 2% | 18 | 1% | 260 | 1% | 6% |
| Italy | 113 | 1% | 16 | 1% | 57 | 2% | 16 | 1% | 202 | 1% | 5% |
| USA | 82 | 1% | 21 | 1% | 37 | 1% | 19 | 1% | 159 | 1% | 4% |
| France | 82 | 1% | 21 | 1% | 38 | 1% | 18 | 1% | 159 | 1% | 4% |
| Spain | 76 | 1% | 18 | 1% | 52 | 1% | 13 | 1% | 159 | 1% | 4% |
| Other | | | | | | | | | | | 47% |
| Other than Finnish, total | | 20% | | 22% | | 29% | | 18% | | 21% | 100% |

Table 3. Applications and funding granted by funding instrument and nationality in 2012–2015: Academy Project, Academy Research Fellow, Postdoctoral Researcher. Source: Academy of Finland funding database.

| Form of funding | Decision year | Applications | | | Granted | | |
|----------------------------------|---------------|---------------|------------|----------------------|--------------|------------|----------------------|
| | | Number | Finnish, % | Other nationality, % | Number | Finnish, % | Other nationality, % |
| Academy Project | 2012 | 1,070 | 89% | 11% | 187 | 91% | 9% |
| | 2013 | 1,196 | 89% | 11% | 198 | 88% | 12% |
| | 2014 | 1,344 | 88% | 12% | 195 | 88% | 12% |
| | 2015 | 1,333 | 89% | 11% | 217 | 86% | 14% |
| Academy Research Fellow position | 2012 | 442 | 80% | 20% | 65 | 82% | 18% |
| | 2013 | 508 | 79% | 21% | 66 | 85% | 15% |
| | 2014 | 561 | 78% | 22% | 62 | 76% | 24% |
| | 2015 | 588 | 76% | 24% | 67 | 82% | 18% |
| Postdoctoral Researcher position | 2012 | 751 | 78% | 22% | 144 | 81% | 19% |
| | 2013 | 851 | 73% | 27% | 129 | 77% | 23% |
| | 2014 | 1,013 | 73% | 27% | 102 | 69% | 31% |
| | 2015 | 1,065 | 72% | 28% | 103 | 77% | 23% |
| Total | | 10,722 | 82% | 18% | 1,535 | 83% | 17% |

3.2 Programme funding and strengthening the profiling of universities

3.2.1 Centre of Excellence programmes

The objective of the Academy of Finland's Centre of Excellence (CoE) research programmes is to improve the quality of Finnish research, renew science and promote the societal impact of research. The Academy selects CoEs for eight-year periods based on international reviews and considerations of science policy. The primary review criteria are the quality of the research plan, renewal and impact.

CoE programmes contribute to the renewal of science in the form of new research teams, subjects, methods and approaches. Long-term joint funding realised with the CoE host organisations enables risk-taking and opens new territory.

A CoE is a research community that is at the top of its field in the world or about to reach the top. It consists of one or more research teams working in close cooperation, implementing a common research plan. The funding enables diverse forms of international cooperation. CoE funding is divided into periods of three and five years.

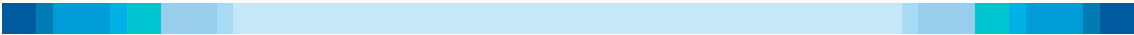
3.2.2 Academy Programmes

An Academy Programme is a thematic, target-oriented and coordinated body of research projects designed to renew scientific research and produce cutting-edge research knowledge in a specific thematic area. The goal is to achieve scientific and other forms of impact. The themes of Academy Programmes arise from the context of international science and from future research needs identified in advance. Academy Programmes support multi- and interdisciplinary research, build networks among researchers and provide a platform for long-term international research collaboration.

The Academy Board decides on the initiation of new Academy Programmes. Funding is normally provided for a minimum of four years. After the Board decision, a steering group is instituted for the preparation, management, monitoring and evaluation of the Academy Programme. The steering group consists of research council members and representatives of other organisations funding the programme. A subcommittee instituted by the Academy Board decides which projects receive funding.

Academy Programmes support international research cooperation in various ways and at several levels. Firstly, Academy Programmes organise joint thematic calls between two or more countries and funding organisations, in which the Academy of Finland funds Finnish researchers and the foreign funding organisation funds researchers in its own country. Researchers from different countries and organisations prepare the contents of the calls (thematic limitation, research questions, etc.) in research workshops. The research consortia have joint research plans, and their applications are reviewed by international panels. The funding organisations agree on how to review applications, which projects to fund and how to monitor them. Jointly funded programme projects participate in the activities of the Academy Programme (e.g. seminars, training, joint publications). The goal has been to organise at least one international call for each Academy Programme. The number of bilateral calls has been on the decline in recent years. One to four ERA-NET or bilateral programme calls have been implemented each year. In 2016, the total volume of these calls was EUR 2.4 million (see Chapter 3.4 for more details).

Secondly, Academy Programmes build networks among researchers and support Finnish researchers in applying for international and foreign funding. The joint international projects and other international cooperation (workshops, seminars, training) funded through Academy Programmes build networks among



researchers. For example, an ERA-NET project funded in a programme will build a solid foundation for a wider research consortium applying for Horizon 2020 funding.

Thirdly, Academy Programmes promote the international visibility of Finnish science, for example, by inviting top researchers from other countries as main speakers in programme seminars, to review applications and programmes and to serve in the programme's steering group, and by organising events together with similar programmes abroad. The programmes also publish compilations of their results. International cooperation in the area of funding also increases awareness of the Finnish research, education and innovation system and familiarises Finnish researchers with the systems of other countries.

Fourthly, Academy Programmes promote global responsibility and cooperation. Earlier, the themes of programmes focused on the grand challenges of society. According to that philosophy, research offered answers to crucial global questions, such as climate change and energy supply. After the introduction of strategic research programmes, the themes of new Academy Programmes are selected from the perspective of the renewal of science. Their impact on global questions is, thus, more indirect.

3.2.3 Strategic research programmes

The funding instrument for strategic research supports knowledge-based management. This form of programme funding is directed at research projects seeking solutions to societally significant problems. The themes of strategic research are decided by the Finnish Government based on proposals made by the Strategic Research Council (SRC). The SRC then launches research programmes based on these themes and chooses the projects to fund under the programmes. The selection criteria include the scientific quality of the research and interaction plan, societal relevance and added value to the programme.

Strategic research funding is aimed at broad, multidisciplinary consortia (SRC consortia). In practice, the frequently global nature of the societally significant problems being studied, nevertheless, means that the SRC consortia nearly always have foreign partners and engage in lively international exchanges. For example, it is typical to assemble an international advisory board to support the research of the consortium.

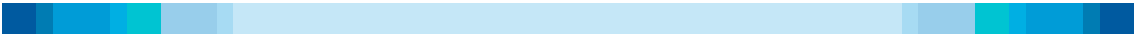
3.2.4 Competitive funding to strengthen university research profiles

The purpose of the profiling funding introduced in 2014 is to support and speed up the strategic profiling of Finnish universities to improve the quality of research. The funding is intended for measures that strengthen the universities' strategic research fields and new initiatives. The purpose is to achieve an international standard of research in the chosen focus areas, which is why the universities are requested to submit plans for achieving such standards. High-quality research environments are attractive partners for international operators, and it is easier to recruit top researchers from other countries into such environments.

3.3 Research infrastructures

Many research infrastructures are so extensive in nature that their efficient use and administration requires cooperation at the national level and, for international infrastructures, at the European or global level.

For several years, the Academy of Finland has supported international and national research infrastructures through membership fees and other forms of funding. Its officials and elected representatives also represent Finland in many



international research infrastructures. The Finnish Research Infrastructure Committee instituted in 2014 in connection with the amendment of the Act on the Academy of Finland decides on the funding of research infrastructures within its resources.

At the same time, the responsibilities of the Academy were extended to cover the monitoring and development of national and international research infrastructure activities on a wider scale. Finland's Strategy and Roadmap for Research Infrastructures

(www.aka.fi/globalassets/awanhat/documents/firi/tutkimusinfrastruktuurien_strategia_ja_tiekartta_2014_en.pdf) supports this work. Descriptions of the infrastructures included in the roadmap are available in the research infrastructure database at <http://infrascience.fi>.

Descriptions of the Academy's infrastructure activities will be updated and specified in 2017.

3.3.1 International research infrastructures

Finland had joined many international research infrastructures even before the establishment of the Finnish Research Infrastructure Committee (incl. CERN, EMBL, ESO and ESA). Finland's membership in these infrastructures permanent. By funding membership fees, the Academy of Finland contributes to Finland's participation in the activities of these infrastructures. Other national sources of funding include Tekes (e.g. ESA) and the ministries.

In addition to these traditional research infrastructures, the scientific community has been increasingly active in the development of European research infrastructures with the development and expansion of activities under the European Strategy Forum for Research Infrastructures (ESFRI). Since 2013, Finland has joined 13 ESFRI infrastructures through five-year treaties. Parliament normally decides on these treaties, which are presented by the Ministry of Education, Science and Culture. At present, the Academy contributes to the funding of 27 international research infrastructures.

The Research Infrastructure Committee issues recommendations on joining new international infrastructures. The actual negotiations are carried out by a ministry or another senior agency. When Finland decides to join an infrastructure, the Academy or another research organisation frequently assumes responsibility for the membership. In practice, representation is most often coordinated through national preparation meetings before meetings of the infrastructure's governing bodies. The Committee is also responsible for the monitoring and evaluation of all infrastructures funded by the Academy.

The members of the Academy's research councils and the Research Infrastructure Committee, along with Academy officials and members of the scientific community proposed by the research councils and the Committee, represent the state of Finland and the Finnish research community in the cooperation bodies of several European infrastructures. Actions are implemented in close cooperation with the Ministry for Education, Science and Culture, with other ministries and the host organisations of the infrastructures consulted where necessary. Such meetings are typically convened from one to four times each year.

3.3.2 Funding for research infrastructure actions

The funding of international and national research infrastructures is always obtained from several sources. In addition to the host organisations (universities, research institutes, universities of applied sciences) of the research infrastructures, the Academy of Finland, Tekes, ministries and, for international

research infrastructures, the corresponding actors in other countries all contribute to the funding of research infrastructures.

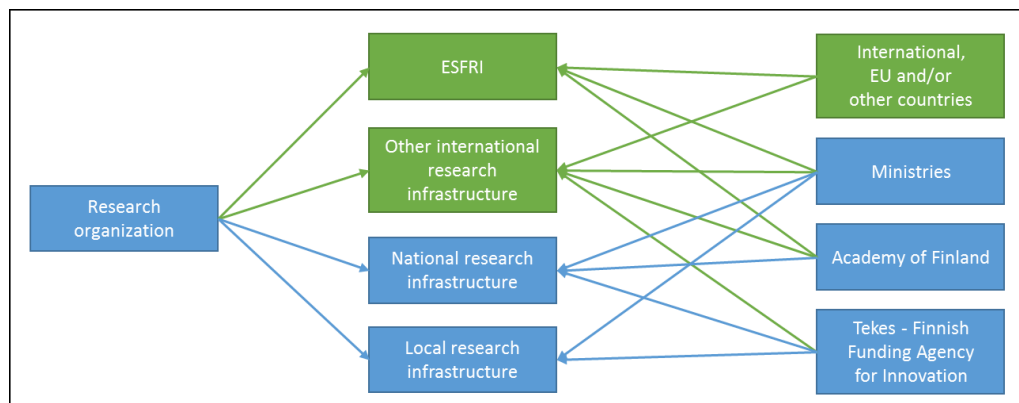


Figure 1. Primary funding of research infrastructures.

The duties of the Research Infrastructure Committee include the monitoring and development of national and international research infrastructure activities. Research infrastructure funding in all its forms (project-type funding and membership fees) is one tool for implementing policy and measures. Approximately EUR 37.5 million is allocated to research infrastructures from the annual budget of the Academy. Of this sum, the Research Infrastructure Committee decides on the spending of EUR 18.5 million, used to fund the infrastructures that have submitted the best applications in the annual calls for infrastructure funding. The remainder is used for the membership fees of international infrastructures based on treaties or other agreements (Figure 2). The percentages of the membership fees of international infrastructures in 2010–2016 are presented in Table 4.

International research infrastructure memberships funded by the Academy of Finland

Environmental Sciences (6)

EISCAT (+3D) European Incoherent Scatter Association
GBIF Global Biodiversity Information Facility
ICDP International Continental Scientific Drilling Program (Research Council for Natural Sciences and Engineering)
IODP Integrated Ocean Drilling Program (Research Council for Natural Sciences and Engineering)
ICOS Integrated Carbon Observation System
EPOS European Plate Observation System

Social Sciences and Humanities (3)

CESSDA Consortium of European Social Science Data Archives
CLARIN Common Language Resource and Technology Infrastructure
ESS European Social Survey

Biological and Medical Sciences (6)

EMBL European Molecular Biology Laboratory
EMBC European Molecular Biology Conference
EATRIS European Advanced Translational Research Infrastructure
BBMRI Biobanking and Biomolecular Resources RI
ELIXIR European Life Science Infrastructure for Biological Information
INFRAFRONTIER The European Infrastructure for Phenotyping and Archiving of Model Mammalian Genomes
EURO-BIOIMAGING European Research Infrastructure for Biomedical Imaging

Natural Sciences and Engineering (4)

CERN European Organization for Nuclear Research
ESO European Southern Observatory
FAIR Facility for Antiproton and Ion Research
NOT Nordic Optical Telescope

Material Sciences and Analytics (2)

ESRF European Synchrotron Radiation Facility
MAX IV Synchrotron Radiation Facility

E-Science and Mathematics (3)

IML Mittag-Leffler Institute
NeIC Nordic e-Infrastructure Collaboration
PRACE Partnership for Advanced Computing

EMBL and EMBC are counted as a single infrastructure.

Figure 2. International research infrastructure memberships funded by the Academy of Finland. The EMBL and EMBC are counted as a single infrastructure.

Table 4. Membership fees of international infrastructures in 2010–2016. Source: Academy of Finland funding database.

| Research infrastructure | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Membership agreements in international research infrastructures valid for the present (1,000 euros) | | | | | | | |
| CERN | 11,188 | 11,027 | 12,319 | 12,663 | 12,584 | 14,681 | 12,932 |
| EMBL | 1,220 | 1,311 | 1,341 | 1,376 | 1,413 | 1,413 | 1,497 |
| EMBC | 213 | 217 | 221 | 229 | 234 | 234 | 255 |
| ESRF | 624 | 551 | 451 | 723 | 588 | 588 | 581 |
| ESO | 2,137 | 1,839 | 2,014 | 2,095 | 2,166 | 2,166 | 2,153 |
| FAIR | - | - | - | - | - | - | - |
| EISCAT | 350 | 350 | 357 | 357 | 374 | 374 | 374 |
| GBIF | 80 | 80 | 63 | 63 | 64 | 66 | 68 |
| ICDP (RC for Natural Sciences and Eng.) | 21 | 23 | 23 | 23 | 22 | 27 | 27 |
| IODP (RC for Natural Sciences and Eng.) | - | - | - | - | - | 65 | 65 |
| IML | - | 50 | 50 | 50 | 50 | 50 | 50 |
| INCF | - | 89 | 94 | 92 | 89 | 114 | - |
| NOT | - | 423 | 398 | 423 | 400 | 400 | 400 |
| NeIC | - | - | 413 | 413 | 413 | 413 | 367 |
| In total | 15,833 | 15,959 | 17,744 | 18,507 | 18,398 | 20,592 | 18,768 |
| 5-year fixed term membership agreements in ESFRI research infrastructures (1,000 euros) | | | | | | | |
| EATRIS | - | - | - | - | 100 | 100 | 100 |
| ELIXIR | - | - | - | - | - | 58 | 61 |
| CLARIN | - | - | - | - | - | - | 30 |
| BBMRI | - | - | - | - | - | 40 | 57 |
| CESSDA | - | - | - | - | - | - | - |
| INFRAFRONTIER | - | - | - | - | - | 24 | 34 |
| ESS | - | - | - | - | - | 37 | 46 |
| EISCAT-3D 22' | - | - | - | - | - | - | - |
| EuBI node | - | - | - | - | - | - | - |
| EPOS | - | - | - | - | - | - | - |
| PRACE | - | - | - | - | - | - | 40 |
| Max IV | - | - | - | - | - | - | - |
| FAIR | - | - | - | - | - | - | - |
| In total | | | | | 100 | 259 | 368 |
| IN TOTAL | 15,833 | 15,959 | 17,744 | 18,507 | 18,498 | 20,851 | 19,137 |

3.4 International cooperation among funding organisations and individual instruments for the promotion of international engagement and cooperation

3.4.1 ERA-NET funding cooperation

ERA-NET is a funding form for EU research and technology framework programmes. The purpose of ERA-NET is the development of cooperation between national research programmes and research funding organisations for the promotion of European research. ERA-NETs build networks between national

or regional programmes, support cooperation and coordination between national and regional research programmes, increase the systematic exchange of information among programmes and chart obstacles to cooperation.

ERA-NETs organise multinational calls for applications for joint projects in fields decided by the operators that belong to the network. During the 6th and 7th Framework Programmes, the European Commission compensated national research funding organisations for the coordination and administration costs of ERA-NETs. In cooperation with the network's funding organisations, the Commission also participated in the funding of research programmes with ERA-NET Plus funding under FP7. Horizon 2020 offers partial funding for both research projects and the activities of networks in the form of ERA-NET Cofund funding, particularly aimed at the needs of Joint Programming Initiatives. Some of the project calls targeted at JPI researchers (see next chapter) are also implemented as ERA-NET Cofund calls.

At their discretion, ERA-NET partner organisations are always free to take part in joint project calls aimed at researchers. At the Academy of Finland, Academy Programmes have allocated funding to ERA-NETs to offer an international dimension, and research councils have joined ERA-NETs considered strategically important for their field of research. In the joint calls for applications organised by ERA networks in 2007–2016, the Academy has funded Finnish consortium partners with a total sum of nearly EUR 35 million (see Figure 3). The annual funding varies between EUR 0.5 and 7 million, depending on the number of calls for applications issued that year. Such calls are also used to repatriate framework programme funding for Finnish projects, for example, approximately EUR 425,000 in 2015. The Academy's Administration Office has also been an active participant in various ERA-NET duties. See the report on the Academy's ERA-NET activities in 2016, www.aka.fi/globalassets/42julkaisut/eranet_report_final_yhd4.pdf, and www.aka.fi/en/research-and-science-policy/international-cooperation/europe/era-nets-and-other-eu-cooperation-networks.

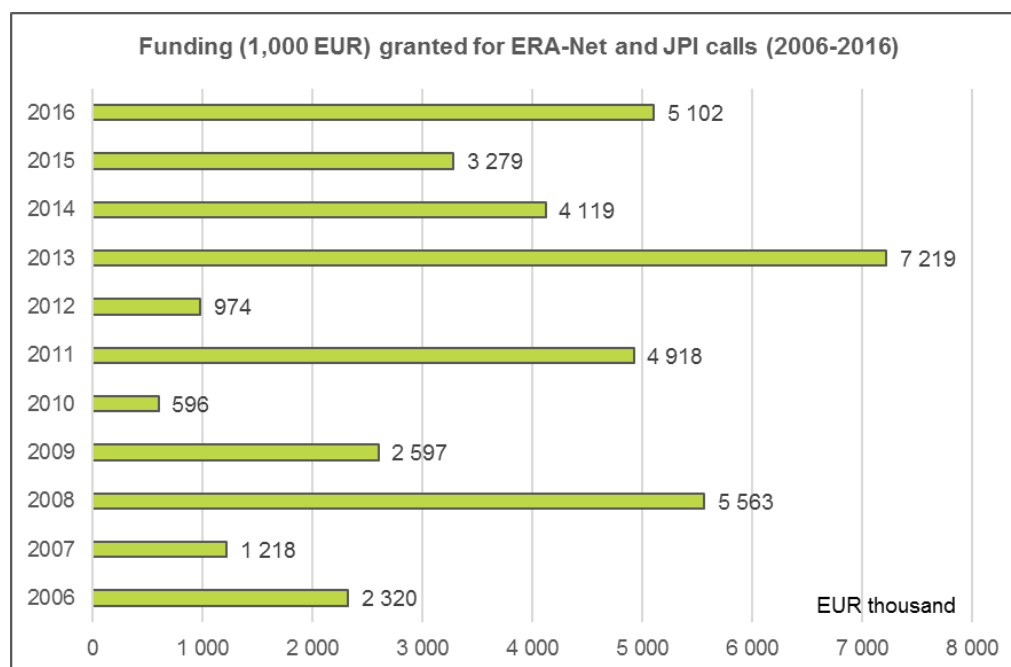


Figure 3. Academy funding for ERA-NET and JPI network calls in 2006–2016 (FP 6, 7 and 8). Sources: European Commission, ERA-LEARN2020 (2006–2015) and Academy of Finland funding database (2016).

3.4.2 Participation in European Joint Programming Initiatives (JPI)

Joint Programming Initiatives (JPI) respond to major European and global social challenges and increase cross-border cooperation. The goal is to achieve more efficient utilisation of the research expertise, resources, equipment, data and results of different countries in coordinated, long-term projects. The ten JPIs currently underway implement their strategic research agendas through joint calls for applications from researchers and, increasingly, other strategic actions. When considering participation in these initiatives, the Academy of Finland reviews their strategic compatibility with national R&D priorities, added value to existing EU cooperation and the current resources.

At their best, the initiatives involve a broad base of operators: key steering and funding organisations for national research activities are represented in their decision-making bodies and their support groups, and Finnish research communities actively participate in the joint actions. In some initiatives, the Academy's participation has been extremely selective.

At present, the Academy is taking part in six JPIs and coordinating a seventh (Water JPI). In other cases, the Academy participates in either the initiative's governance or the activities of the national support group. The Academy additionally represents Finland in the European Research Area Committee (ERAC GPC) that steers JPI activities. The Academy has funded calls for applications from JPI researchers with an annual sum of approximately EUR 0.5 to 1.5 million. Some of the calls are implemented as ERA-NET calls (see previous chapter). The initiatives' shared administration costs are covered either with EU funding or membership fees, which are in the region of a few thousand euros for the Academy.

3.4.3 Article 185 Initiatives

Article 185 Initiatives are extensive, multiyear partnership programmes between EU Member States and the Commission that strive for close cooperation among, and even the integration of, national programmes. Implementation of the programmes requires a unified administrative structure in which the Member States have joint responsibility for the implementation of calls for funding applications. Five Article 185 programmes are currently underway, and the Academy of Finland participates in two of them.

Eight countries participate in the joint Baltic Sea research and development programme BONUS. The objective of the programme is to support scientific development and innovation by providing the required funding framework for research cooperation among Baltic states. The programme's funding amounts to EUR 100 million, paid in equal proportions by the participating Member States and the EU Commission. The BONUS secretariat (EEIG) based in Finland is responsible for the coordination of funding. The call themes are based on the BONUS programme's strategic research agenda for 2011–2017. Roughly EUR 4 million of Academy funding was distributed in calls implemented in 2012 and 2014. The fourth call for applications, Blue Baltic, was implemented in 2016 with a funding of approximately EUR 2.3 million.

EDCTP2 (European and Developing Countries Clinical Trials Partnership) is a partnership programme between European and sub-Saharan countries. The programme supports clinical research collaboration aimed at the development of new drugs, vaccines and diagnostics to prevent and treat infectious diseases. This research will receive nearly EUR 1.4 billion in funding in 2014–2024, half of which will be provided by the EU. The Academy contributes EUR 2 million.

3.4.4 NordForsk funding cooperation

NordForsk is a Nordic research funding organisation that was established in 2005. It operates under the Nordic Council of Ministers with responsibility for Nordic cooperation in research. NordForsk receives its funding from the Nordic Council of Ministers and the national research funding agencies of Nordic countries. The board of NordForsk is composed of representatives of these national funding agencies, with the Academy of Finland represented by the Vice President for Research. The NordForsk secretariat is based in Oslo.

NordForsk seeks to identify fields of research in which a Nordic approach would be useful. Together with national funding agencies, it funds Nordic research and coordination projects and makes recommendations to the Nordic Council of Ministers. NordForsk funding is common-pot funding, which means that the funding organisations hand their contributions over to NordForsk for management, and NordForsk takes care of arranging calls for applications and the evaluation of projects. All NordForsk projects include researchers from a minimum of three Nordic countries (Iceland, Norway, Sweden, Finland, Denmark) or autonomous areas (Åland, the Faroe Islands and Greenland).

In 2016, the Academy contributed funding to seven research programmes launched by NordForsk. The amount of annual funding has increased steadily since the launch of the first programmes in 2010 (Table 5).

Table 5. Funding granted by the Academy of Finland to NordForsk research programmes in 2010–2015. Source: Academy of Finland funding database.

| Year | Funding for NordForsk programmes (EUR 1,000) |
|------|--|
| 2010 | - |
| 2011 | 1,007 |
| 2012 | 2,780 |
| 2013 | 2,080 |
| 2014 | - |
| 2015 | 1,175 |
| 2016 | 1,991 |

3.4.5 Nordic NOS cooperation

The Academy of Finland's research councils participate in the activities of the cooperation bodies of Nordic research councils, Nordiska samarbetsnämnden (NOS). NOS-HS for the humanities and social sciences, NOS-N for natural sciences and engineering and NOS-M for health sciences function as the Nordic cooperation and expert bodies for research in their fields.

The activities of the NOS councils primarily consist of exchanging information, seeking to identify best practices and advocacy in science policy. NOS-HS additionally has two forms of funding for researchers, workshop grants and journal grants. The Academy's Research Council for Culture and Society funds the activities of NOS-HS with approximately EUR 400,000 each year.

3.4.6 Academy research funding based on bilateral agreements

The Academy of Finland has decreased the number of bilateral agreements made with research funding organisations from other countries, but still has some agreements in place, mainly with non-European funding organisations. Most of these agreements enable the funding of joint research projects. Jointly agreed and scheduled project calls on themes considered important by both parties make it

possible for researchers to receive funding simultaneously with colleagues abroad. In bilateral agreements, the Academy currently prioritises Brazil, Chile, South Africa, India, Japan, China, the United States and Russia. Partnerships can be formed with several funding agencies from the same country. The agreements with Germany and Taiwan only cover mobility (see Chapter 3.4.7).

Calls for joint projects have been implemented since 2001, when the Academy offered funding for the cooperation of Finnish Centres of Excellence with NSFC, a Chinese funding organisation for basic research. The volume of Academy funding for bilateral projects was the greatest in 2013, when funding decisions were made for no less than 12 bilateral calls implemented in 2012–2013 (see Figure 4). After 2010, the calls have mostly been implemented as part of Academy Programmes, in which case the funding decisions, based on the proposals of the programme's steering group, are made by the programme subcommittee instituted by the Board.

Different numbers of calls have been held with different countries, with different themes and funding periods. The Academy has also engaged in trilateral funding cooperation (e.g. mineral resources call with South Africa and Chile within the MISU Academy Programme). In 2011–2016, joint projects with China received the largest proportion of bilateral funding (see Figure 5).

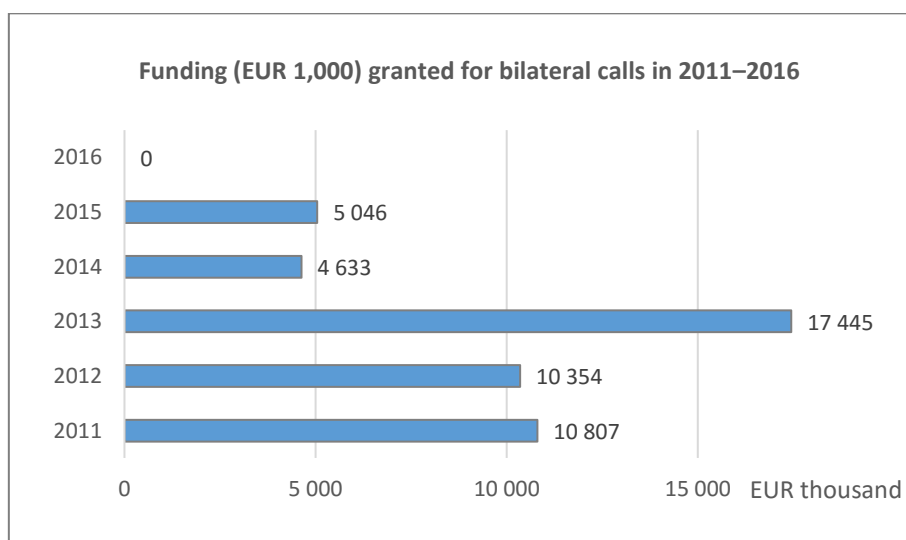


Figure 4. Funding granted for bilateral funding calls in 2011–2016. Source: Academy of Finland funding database.

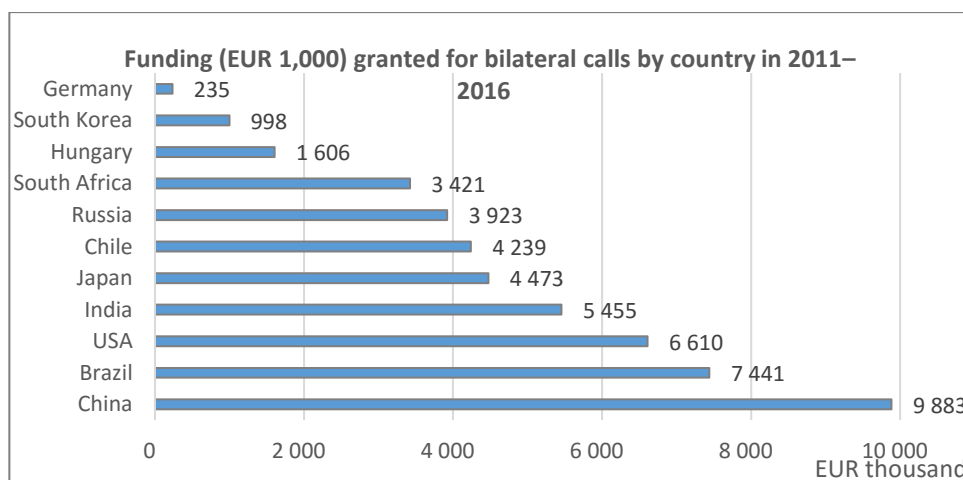


Figure 5. Funding granted for bilateral calls by country in 2011–2016. Source: Academy of Finland funding database.

3.4.7 Mobility grants based on the Academy's bilateral agreements

Based on agreements signed by funding organisations, the Academy issues mobility grants to researchers, both for visits abroad and for inviting researchers of other nationalities to visit Finland. In autumn 2016, mobility grants were opened for application based on agreements signed with India, Japan, China, Taiwan, Russia and Germany. Mobility funding for the US was open for application in the spring of 2016. The terms and conditions of funding vary depending on the agreement. The duration of the funded visits varies between one week and 12 months (except for Japan's JSPS Fellowship, whose maximum duration is 24 months).

The award decisions for mobility funding are made by the chairs of the Academy's research councils. In 2011–2016, the Academy spent nearly EUR 1 million on average per year on mobility grants. Approximately 45 per cent of all mobility grant applicants apply for mobility funding concerning Russia.

Table 6. Sums* paid for mobility grants in 2011–2016. Source: Academy of Finland funding database.

| Year | Sum granted (EUR 1,000) |
|------|-------------------------|
| 2011 | 1,066 |
| 2012 | 820 |
| 2013 | 924 |
| 2014 | 873 |
| 2015 | 1,072 |
| 2016 | 997 |

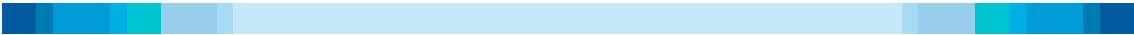
Table 7. Share* of mobility applications and granted applications by country in 2010–2015. Source: Academy of Finland funding database.

| Country | No. of applications | Percentage of total no. of applications | Percentage of total sum granted |
|--------------|---------------------|---|---------------------------------|
| Russia | 351 | 45% | 44% |
| Japan | 133 | 17% | 17% |
| Germany | 119 | 15% | 19% |
| China | 82 | 10% | 3% |
| India | 39 | 5% | 8% |
| South Africa | 24 | 3% | 4% |
| USA (2012–) | 5 | 1% | 1% |
| Other | 31 | 4% | 3% |
| Total | 784 | 100% | 100% |

* Due to the different natures of the funding processes, Tables 6 and 7 do not include researchers who come to Finland from Russia, China and Japan on research exchange scholarships.

3.4.8 Funding for development research

The Academy of Finland and the Ministry for Foreign Affairs of Finland fund problem-oriented and multidisciplinary development research. Development research analyses the dimensions of development, helps understand obstacles to development and finds ways in which those obstacles can be removed. The themes of development research stem from the UN's sustainable development targets (Agenda 2030) and the millennium development goals that preceded them.



The Ministry's research funding is taken from Finland's development cooperation funds, and the countries listed by the OECD's DAC committee are eligible subjects for development research. Until 2014, applications for development research funding were invited in the Academy's September application round each year. EUR 3 million have been distributed in each round, taken from the Academy's budget every third year and from the Ministry's budget for the other two.

The applications are reviewed according to the Academy's general review criteria. Reviewers consider how well the application is connected to the field and the importance of the project with regard to cooperation with developing countries and targets of development policy.

The Academy and the Ministry are in the process of updating the development research funding instrument. The intention is to turn development research funding in a more systematic direction, with the objective of building networks among the projects and through international activity. Cooperation will be emphasised to a greater extent in the projects, and the impact of the research and usability of the results will be given greater weight.

3.4.9 Funding for Antarctica research

On the basis of Finland being party to the international Antarctic Treaty, the Academy of Finland organises a targeted call for Antarctic research every four years. The objective of the funding is to open internationally significant new territory in Antarctic research. In accordance with Finland's Antarctic Strategy (2014), the Academy supports interactive and multidisciplinary research. International cooperation is a condition for project funding. Applications were last invited in 2016, when the Academy granted approximately EUR 2 million to the projects. The calls are organised in cooperation with the Finnish Meteorological Institute's organisation for Antarctic logistics (FINNARP), which is responsible for arranging the fieldwork in the projects funded by the Academy.

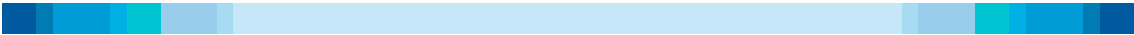
3.4.10 European University Institute membership and funding for work at EUI

Finland has been a member of the Florence-based European University Institute (EUI) since 1997. Membership in the institute is based on a treaty. The purpose of the EUI is to "contribute through its activities in the field of higher education and research to the development of Europe's cultural and scientific heritage in its entirety and full diversity". The institute provides postgraduate training, engages in research and is authorised to award doctoral degrees.

The EUI receives funding from both the EU and EUI member states. Finland's annual proportion of membership funding is 1.17%. In 2016, Finland's membership fee was EUR 336,000, in addition to which Finland contributed nearly EUR 27,000 to the EUI pension fund.

The highest administrative body in the EUI is the High Council, which consists of representatives of the signatory states to the treaty. A representative of the Academy of Finland has been appointed by the Finnish Government to serve as Finland's permanent representative on the Council. Meetings of the High Council are also attended by a representative of the Ministry of Education, Science and Culture. The Budget Committee serves as an advisory body to the High Council. The representative of the Academy is Finland's national representative on the committee.

The Academy's Research Council for Culture and Society normally funds the enrolment of three new doctoral candidates in the EUI postdoctoral programme. Applications are submitted directly to the EUI, which selects the candidates in consultation with the Academy, which in turn grants funding to the selected



candidates. The funding consists of a monthly personal grant of roughly EUR 2,000. Other research-related costs can be paid in addition to this.

An application for funding for a research post as Academy Professor or Academy Research Fellow can include funding for a one-year research visit to the EUI. The applications are submitted directly to the EUI, which selects visiting researchers according to its own discretion. The same applies to the EUI Max Weber exchange programme, which is intended for postdoctoral applicants who have received their doctoral degrees in the past five years.

3.4.11 IIASA membership and funding for work at IIASA

The International Institute for Applied Systems Analysis (IIASA) is an international institute for applied systems analysis located in Austria. The institute promotes dialogue among nations through science and scientists. To support decision-making, it produces scientific information on global issues that are too broad or complex for resolution by a single country or discipline.

Finland joined the IIASA by treaty in 1976. The responsibility for Finland's cooperation with the IIASA lies with the Academy of Finland. The Academy institutes Finland's IIASA working group, which functions as an IIASA member organisation. In accordance with the nature of IIASA activities, scientists, the parties who make use of research and public administration are all represented in the working group. The task of the group is to: 1) steer, monitor and develop Finland's participation in the operations of the IIASA; 2) decide on Finland's representation in IIASA bodies other than the council and 3) follow research related to the activities of the institute and promote its utilisation in Finland.

The IIASA membership fee is EUR 700,000 per year. The Academy supports the participation of students in the IIASA YSSP programme for young researchers at the amount of EUR 5,000–15,000 per year. Dozens of Finnish researchers visit the IIASA each year; seven Finns worked at the institute at the end of 2016. Nearly 250 Finnish researchers visited the institute in 2008–2016. In addition to this, the IIASA and Finland have joint research projects and projects for supporting decision-making, and the IIASA organises various events in cooperation with Finnish organisations.

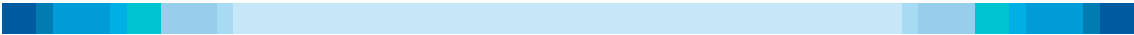
3.5 Support for international funding applications

3.5.1 EU application counselling

It has been agreed at the national level that the Academy of Finland and Tekes will share responsibility for counselling on EU framework programme funding, i.e., the NCP activities (national contact points). The European Commission defines the duties of the NCP, and the activities are coordinated by the Tekes EUTI unit in Finland.

In November 2016, the Academy had ten NCPs placed in its various units. Six of them advise applicants in Pillar I applications and three in Pillar III applications (challenges 1–2, 5–6). One NCP is responsible for the horizontal Science with and for Society programme. The NCPs organise briefings and speak at events organised by others, communicate on calls and results through various channels (increasingly on social media) and compile statistics. Most NCPs are members of the EU-wide NCP network in their own field. All Finnish NCPs have been appointed as expert members of the programme committees of their own fields of responsibility.

Thirty per cent of the working hours of experts serving as NCPs are normally reserved for EU counselling. ERC Starting Grant and Consolidator Grant



applicants who reach the second round are provided with interview training by consultants at the Academy. In 2016, the costs of such training amounted to nearly EUR 24,000. The Academy and EUTI have shared these expenses.

3.5.2 SRC matching funds for Horizon 2020

In the rationale of the government proposal for the amendment of the Act on the Academy of Finland, it is stated that the Strategic Research Council (SRC) can grant funding as national matching funds for EU projects or the projects of other international research funding organisations. In accordance with a policy outlined by the SRC (11 May 2015), strategic funding can be granted as matching funds to projects funded from the Horizon 2020 programme's Societal Challenges pillar and that are in line with the themes and areas of emphasis specified by the Government and the SRC's programme structure.

Applicants must append a funding agreement signed by the European Commission to their applications, and the research services at the place of performance will calculate the funding shortfall. The amount of funding granted is equal to the reimbursement rate decided by the SRC, calculated from the difference between the overheads percentage calculated using the Finnish full cost model and the indirect costs reimbursement calculated using the flat rate model of Horizon 2020 (funding shortfall). All applications processed at the same time will be granted funding according to the same reimbursement rate (0–75% of the funding deficit).

The SRC made 59 matching funds decisions in 2015. The amount of funding applied for was approximately EUR 6.6 million, and approximately EUR 2.8 million was granted. The SRC made 75 matching funds decisions in 2016. The amount of funding applied for was approximately EUR 9.6 million, and approximately EUR 3.9 million was granted. The SRC will evaluate the impact and resource-efficiency of this form of funding in the 2017 interim review, which constitutes a part of the evaluation of the research institute reform of the Prime Minister's Office.

3.5.3 EURAXESS network coordination

EURAXESS – Researchers in Motion is a network consisting of the European Commission and 40 European countries. The purpose of the network is to support internationally mobile researchers. EURAXESS seeks to develop and reinforce the European Research Area, promote the mobility of European researchers and increase the attractiveness of Europe to researchers from other parts of the world. The EURAXESS network provides researchers with information on open research positions and help with the practical aspects of mobility. EURAXESS Finland serves researchers moving to or out of Finland.

The Academy of Finland is the network's bridgehead organisation (BHO) in Finland and maintains the EURAXESS Finland portal. The EURAXESS Service Centres network includes eight service centres in Finland, located in universities. The network consists of more than 250 service centres in Europe. The Academy coordinates the network at the national level and manages communications between the national network and the Commission.

[In spring 2017, it was decided that the EURAXESS functions will be transferred to the Finnish university network FAMO coordinated by the University of Helsinki.]

3.6 Advocacy in European organisations

3.6.1 Committee work in the EU Research and Innovation Framework Programme and other advocacy in the EU

Horizon 2020 is the eighth and largest EU Framework Programme for Research and Innovation, covering the period 2014–2020. As with previous framework programmes, representation in the programme committees has been divided among Finnish ministries, the Academy of Finland and Tekes. Committee work is coordinated by the Ministry of Economic Affairs and Employment (MEE). A cooperation network of relevant administrative branches has been created for the coordination of the work.

The MEE also chairs the EU20 subcommittee responsible for preparing Finland's EU white papers on research and innovation and acting as a general discussion forum for matters related to R&D in the EU. Various stakeholders (e.g. universities, universities of applied sciences, research institutes and labour and employers' organisations) are extensively represented in the subcommittee. The Academy is represented in the EU20 subcommittee by the Vice President for Research and the Manager of International Affairs.

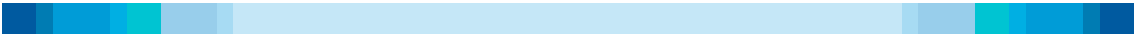
The Academy's committee work is focused on the Horizon programme's first and third pillars, in which Academy officials work as delegates and expert members. Many of the expert members simultaneously function as national contact points (NCP) for Horizon 2020, relaying information on EU calls and supporting the preparation of applications (see Chapter 3.5.1). In December 2016, six delegates and 16 experts from the Academy participated in seven Programme Committees and the Strategic Configuration of Horizon.

The key task of Programme Committees is preparing work programmes and monitoring their implementation. For its part, the Strategic Programme Committee prepares strategic programmes for the framework programme and discusses the programme's overarching themes and questions. The Academy also has expert members in the second pillar of Horizon, for which Tekes has the main responsibility. To compile the opinions of the Finnish research field and gather comments, the committee members maintain support networks with members from universities and research institutes in particular. Preparing for the meetings also requires cooperation with the Ministry of Education, Science and Culture, the Ministry of Economic Affairs and Employment, Tekes and the ministries responsible for the sector.

Horizon 2020 is supplemented with measures intended to support the creation of the European Research Area (ERA), with the purpose of improving the efficiency of national R&D systems and promoting open science and mobility, among other things. Representatives of EU Member States form the ERA Committee, with numerous working groups operating under it. The Academy is represented in two of these working groups. One of these working groups promotes joint programme planning at the European level (Joint Programming, see Chapter 3.4.2), while the other promotes cooperation in the planning and use of research infrastructures (ESFRI Working Group, see Chapter 3.3). In addition, the Academy supports the Ministry of Education, Science and Culture as an expert in other duties related to the ERA.

3.6.2 The Academy's EU office in Brussels

The Academy's office in Brussels (Finnish Liaison Office for EU R&D, FiLi) proactively monitors and analyses the development of the European Union's research and innovation policy (preparation, legislation, etc.) and conveys this information to Finland. The liaison office is also tasked with creating and maintaining contacts between Finnish science policy makers and their



counterparts in the EU and, in particular, supporting the Academy's management in its EU advocacy.

The EU office actively participates in the formulation of the Academy's positions on EU research policy and communicates these positions to EU organs and other crucial parties. As part of this advocacy work, the EU office maintains an extensive network of contacts in the field of EU research and innovation policy.

The liaison office is shared with Tekes, and one expert from each organisation works at the office. The organisations also have a shared trainee at the office. This close cooperation with Tekes also extends to the EUTI unit responsible for the coordination of NCP activities and framework programme communications in Finland. Both experts working in the EU office also participate in the activities of the EU20 subcommittee and keep active contact with the Ministry of Education, Science and Culture and the Ministry of Economic Affairs and Employment.

3.6.3 COST steering group

Finland is a member of COST (European Cooperation in Science and Technology) by treaty. The mission of the organisation is to build networks among different fields of science in Europe. COST Actions are initiated on subjects proposed by researchers. The actions are especially intended to support network-type cooperation between young researchers and new research teams in new fields of science and technology. Research communities have been given COST funding for the preparation of European consortia for Horizon 2020 projects, for example. Even though the activities are Europe-centric, the networks are open to research teams from anywhere in the world.

The activities of COST are steered by representatives of the countries that have joined the organisation. Finland is represented by Tekes and the Academy of Finland in the COST steering group. COST is an independent organisation based in Brussels. It arranges the calls for COST Actions and assists in their management. The actions are funded under Horizon 2020. In Finland, practical matters related to COST are coordinated by Tekes. The Academy has a member in the COST Action TD1408 INTREPID Management committee.

3.6.4 Science Europe activities

Science Europe is an association of European research and funding organisations with a significant impact on their national research systems. The association promotes the consolidation of the European Research Area and cooperation in the fields of science and research by drawing up reports, surveys and white papers with its membership organisations in support of these goals.

The actual work is mostly performed in various working groups with jointly agreed themes. The themes have included infrastructures, questions of research ethics, open science and cross-border research cooperation. The Academy of Finland is represented in some of these working groups. The general meeting of Science Europe convenes biannually and is attended by the management of the Academy. Science Europe does not fund research.

3.7 Advocacy in global organisations and projects

3.7.1 OECD Global Science Forum

The mission of the OECD is to promote sustainable economic development, employment and social wellbeing. Through its activities, the OECD supports the economic and social decision-making of its members.



The Academy of Finland is Finland's representative in the OECD Global Science Forum (GSF). The GSF is tasked with expanding the potential for international cooperation in the field of scientific research. Based on surveys and reports, the GSF issues recommendations to its member states. The GSF discusses broad questions of science policy, charts emerging fields of research cooperation and investigates the necessity, viability and implementation of projects that require major investments.

An Academy official serves as Vice President of the Global Science Forum, and the Academy has representatives in the OECD's CSTP/BNCT (Bio-nano Converging Technologies) and EOCFS (Effective Operation of Competitive Funding Systems) working groups.

3.7.2 UNESCO's national coordination group

The national coordination group for UNESCO science programmes, instituted by the Ministry of Education, Science and Culture in 2009, convenes approximately once per year to review the issues raised by UNESCO in its own science programmes. The Council of Finnish Academies serves as the secretariat for the national coordination group, thus seeking to consolidate the impact of science and research in UNESCO's work. The Academy of Finland is an expert member in the coordination group and communicates current scientific issues to the national bodies responsible for each UNESCO science programme, which are also members of the coordination group.

3.7.3 FinCEAL project

The FinCEAL Initiative (Developing Finnish Science, Technology and Innovation Cooperation between Europe, Africa, Asia and the LAC Region) is a project that supports the participation of Finnish researchers and experts in science policy discussions and research cooperation with third countries. FinCEAL offers travel grants to and from Finland for participation in events and cooperation, or for the preparation of Horizon 2020 applications.

In addition, FinCEAL compiles information provided by researchers on research projects implemented with third countries into the InfoBank and enhances national coordination with regard to third countries.

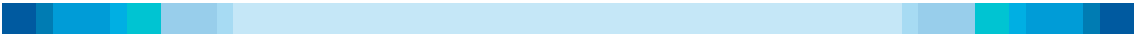
The Ministry of Education, Science and Culture is responsible for the funding and implementation of FinCEAL and UniPID (Finnish University Partnership for International Development). UniPID is supported by a steering group consisting of representatives of ministries and research funding organisations and convenes three or four times a year. The Academy of Finland has a permanent member and deputy member in the steering group. UniPID also has three continent-specific support groups consisting of researchers.

The FinCEAL Initiative consists of three consecutive projects implemented over 2013–2018. After this, the intention is to establish the activities of FinCEAL by integrating it with two or three universities and gathering funding from different sources.

3.8 Other activities for promoting international engagement and cooperation

3.8.1 State of Scientific Research in Finland and other analyses of the international standard of research

The Academy of Finland's reviews on the State of Scientific Research in Finland produce materials that support the development work of universities and research



institutes and that consolidate the knowledge base available for science policy makers. The Academy has reviewed the state of scientific research in Finland regularly since the late 1990s.

The reviews of 2014 and 2016 examined the resourcing of research in universities and government research institutes from statistical data. Publishing, scientific impact and publishing cooperation are reviewed with bibliometric methods. Especially the bibliometric analyses include international comparisons. Each review additionally examines a special theme with key importance for science policy (e.g. recruitment, infrastructures, impact) in more depth.

A steering group headed by the President of the Academy is appointed for the preparation of the State of Scientific Research in Finland report. The steering group includes representatives of universities, research institutes, the Academy Board and the Ministry of Education, Science and Culture. Strong stakeholder work plays an important role in the preparation and utilisation of the reviews. The work requires the special expertise of CSC, the IT Centre for Science, in bibliometric calculations. The statistics are compiled in cooperation with the Ministry and Statistics Finland. The special themes of reviews have required cooperation with universities, for example, in the field of data collection.

The drafting work of the State of Scientific Research in Finland reviews has developed in a more statistics-oriented direction, and CSC has gained a crucial role in bibliometric calculation and its development. With regard to the materials for the report, the Academy has also enhanced its cooperation with the Ministry. Discipline- and organisation-specific materials are now available from the Vipunen statistics service of the Finnish National Agency for Education.

3.8.2 International visits to and by the Academy

The Academy of Finland receives delegations from organisations such as the science ministries of other countries and foreign research funding organisations equivalent to the Academy. The visitors normally arrive from countries with which the Academy has signed bilateral agreements or that wish to sign such agreements with the Academy. Most often such visitors also wish to acquaint themselves with the Finnish science and innovation system and the Academy's policies and funding schemes. The Academy was visited by 14 foreign delegations from ten different countries in 2016. The greatest number of visitors came from China. Correspondingly, the management of the Academy participates each year in delegations sent by the Ministry of Education, Science and Culture, including meetings related to national science and technology treaties.

3.8.3 Academy of Finland's international newsletter

The Academy of Finland's international newsletter is intended for the Academy's international stakeholders. These include affiliated organisations, EU science officials, scientific experts at embassies, universities and science journalists. The newsletter is also subscribed to by researchers of various nationalities, many of whom work in Finland.

4 Stakeholder views of the Academy's activities for promoting international engagement and cooperation

Evaluating the impact of the Academy's activities for the promotion of international engagement and cooperation is vital. This work is performed by, for example, monitoring statistics and reviewing the reports drawn up by the recipients of Academy funding after their projects. To support policy work, the Academy wanted more information on whether its stakeholders consider the Academy's current roles and actions appropriate and effective. To this end, an extensive stakeholder survey was sent to more than 800 recipients in December 2016. A more limited questionnaire was additionally sent to researchers who had received funding from joint application rounds organised by several Member States and matching funds from the Academy (ERA-NETs, JPI application rounds and calls for applications based on Article 185). The results of the surveys are presented in this chapter.

4.1 Extensive stakeholder survey

In December 2016, the Academy of Finland sent an electronic survey to its stakeholders, the largest group of which consisted of researchers funded within the past five years. The bilingual (Finnish and English) questionnaire asked the recipients to provide some background information and indicate whether they had served in the Academy's decision-making bodies and the type of funding possibly granted to them by the Academy. In the actual multiple-choice questions, the respondents were asked to evaluate the impact of the Academy's various funding schemes and its activities in four other roles.

The recipients were also asked to evaluate the significance of the Academy's five roles in a hypothetical future scenario set in 2037 and to present their own future scenario and the action required from the Academy in that scenario. Finally, the respondents had the opportunity to make free-form requests and proposals to the Academy for the promotion of international engagement and cooperation.

The Academy received a total of 885 answers, 775 of them from stakeholders. The same survey was also taken by 39 members of the Academy's elected bodies and 44 employees of the Administration Office. The results of the survey are presented in Figures 6–11.

Figure 6 illustrates that there are no radical differences in the views of stakeholders and Academy decision-makers and administrative employees with regard to the various funding instruments. All groups considered jointly funded international research programmes, bilateral project calls, research career funding and dedicated mobility funding to be the most important enablers of international engagement and cooperation. However, stakeholders assigned slightly greater importance to bilateral project calls and dedicated mobility funding than Academy actors did (also see Figure 7).

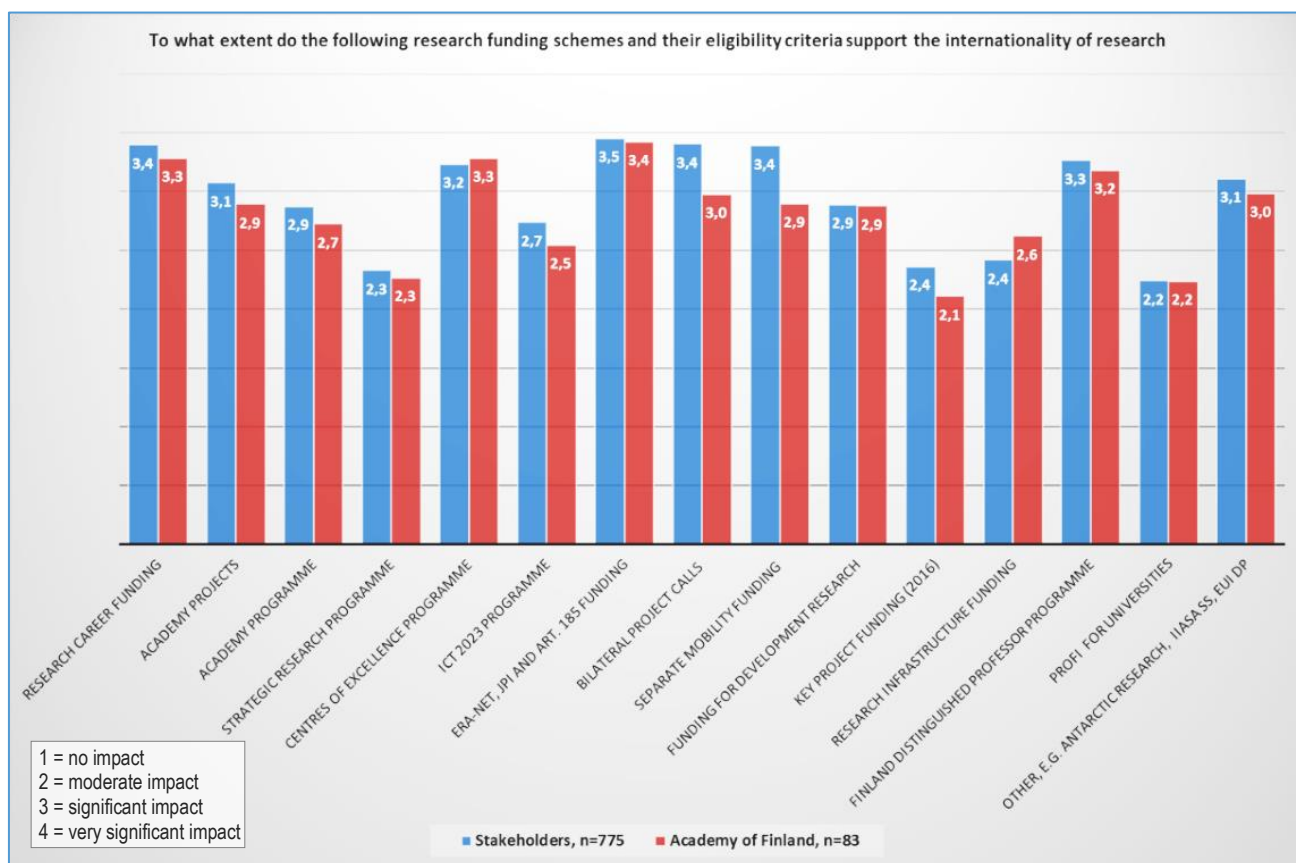
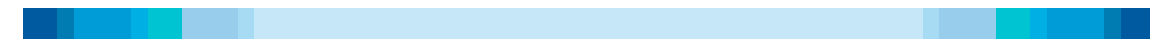


Figure 6. Comparison between the views of stakeholders and the Academy (decision-makers and Administration Office) on the importance of the Academy's funding instruments for the promotion of international engagement and cooperation in research (Role 1).

Figure 7 illustrates the distribution of stakeholder views in the various funding instruments, including the percentages of "no opinion" answers, which were fairly numerous for certain instruments.

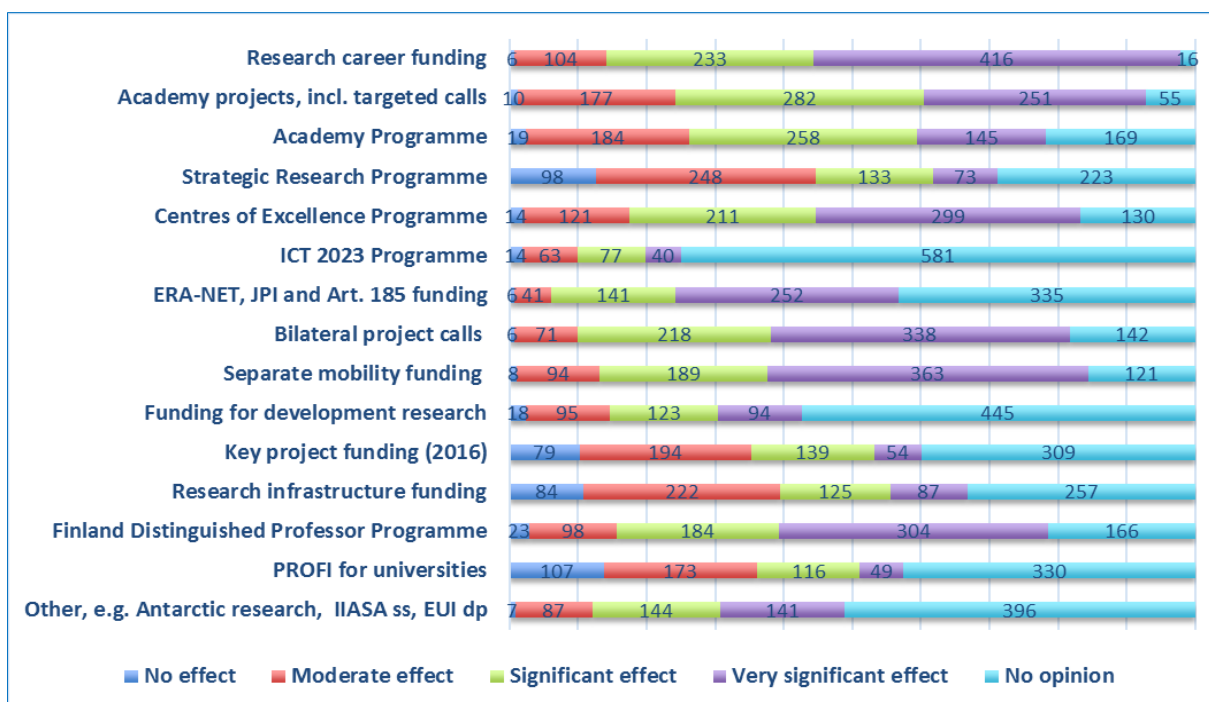


Figure 7. Stakeholder (N = 775) evaluations of the significance of the Academy's funding instruments with regard to the promotion of international engagement and cooperation (Role 1).

Figure 8 presents the stakeholders' views of the Academy's activities as an advocate in international forums. The most importance was assigned to advocacy in a Nordic context, in the Programme Committees of the EU Framework Programme for Research and Innovation and to cooperation with non-European countries.

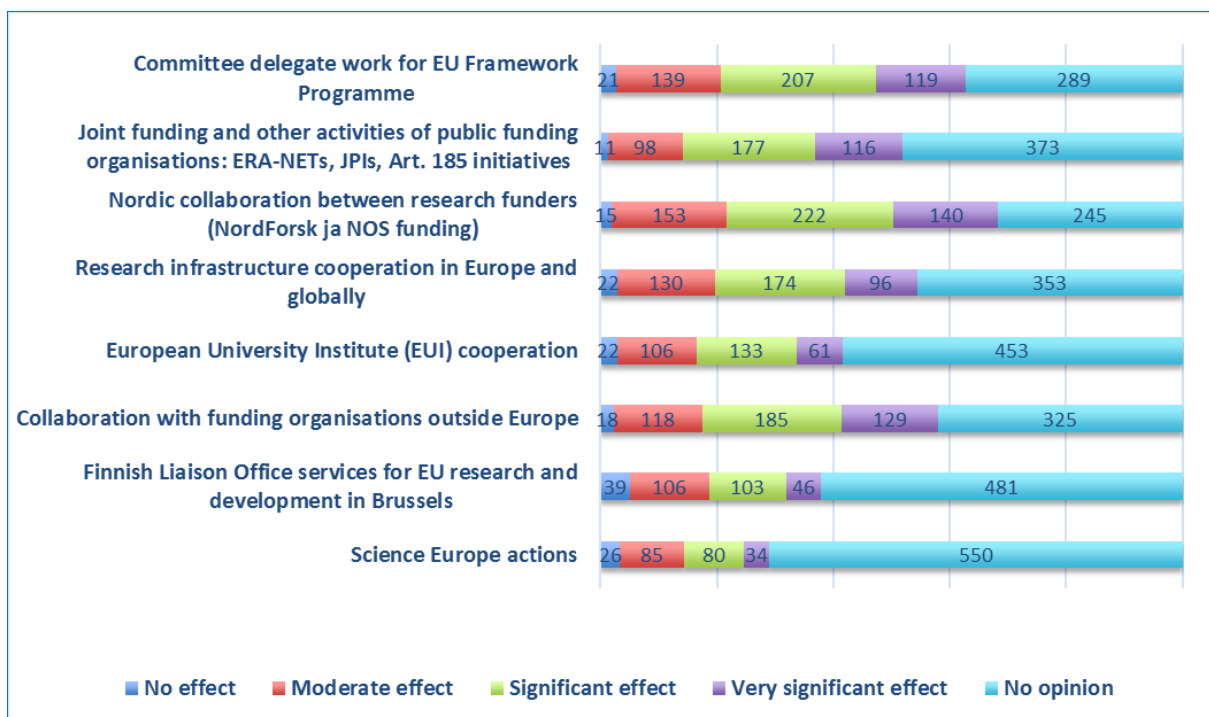


Figure 8. Stakeholder (N = 775) evaluations of the Academy's activities for promoting international engagement and cooperation in research in Role 2: "The Academy of Finland acts in different international forums and promotes funding opportunities for Finnish researchers".

Figure 9 illustrates that stakeholders considered the possibility to prepare international project applications with support from the Academy to be the most important form of activity and form of support for funding applications.

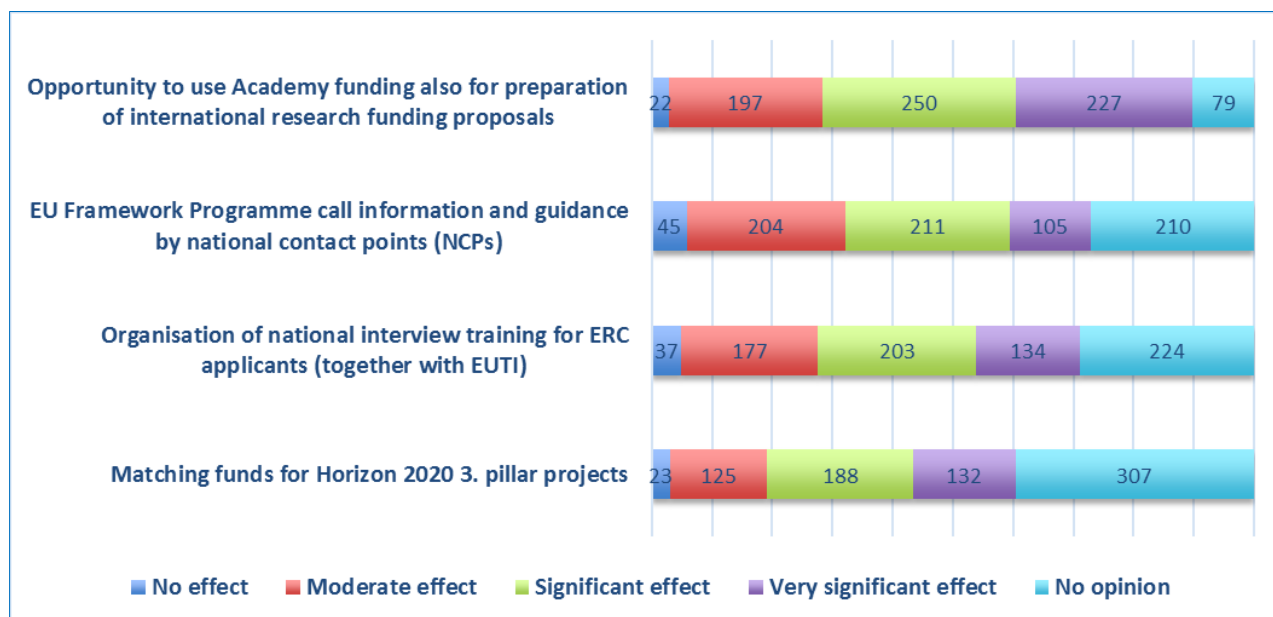


Figure 9. Stakeholder (N = 775) evaluations of the Academy's activities for promoting international engagement and cooperation in research in Role 3: "The Academy of Finland offers support in applying for international research funding".

Figure 10 illustrates the Academy's role as a producer of knowledge and expertise in the promotion of international engagement and cooperation. The stakeholders perceived the international review of applications to be the most important factor by far. On the other hand, the impact of the international newsletter was not considered to be material.

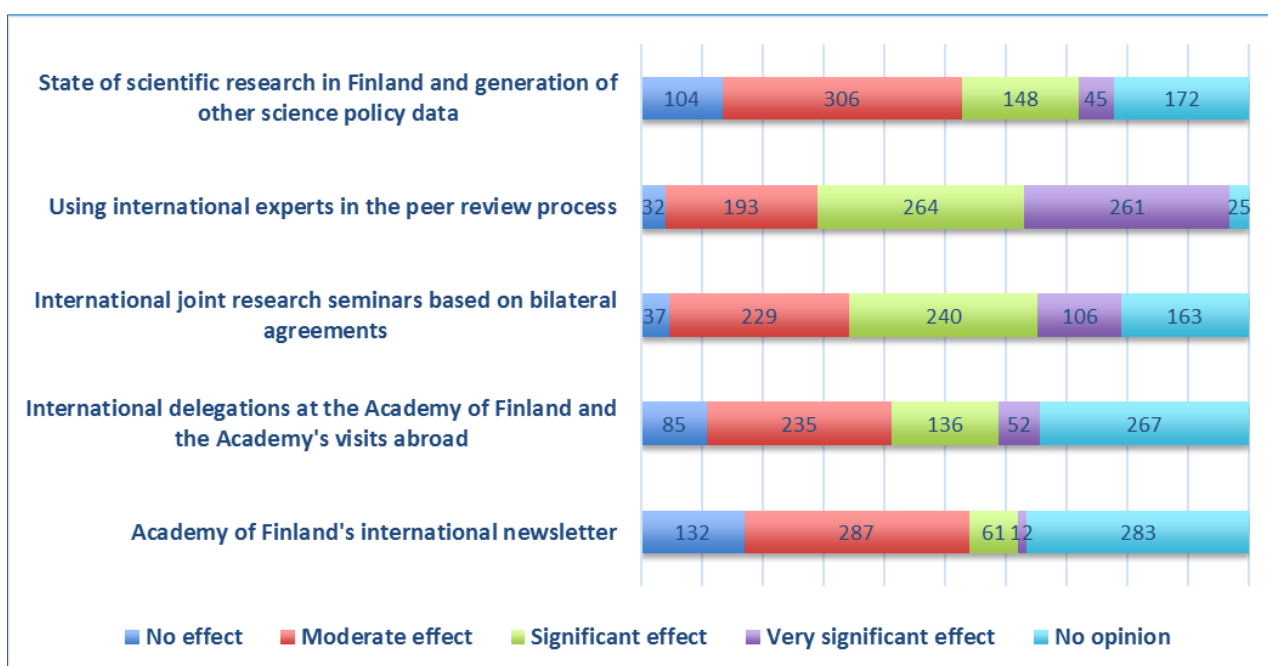


Figure 10. Stakeholder (N = 775) evaluations of the Academy's activities for promoting international engagement and cooperation in research in Role 4: "The Academy of Finland produces knowledge about Finnish research and provides expertise in science policy".

Figure 11 presents views of the Academy's role as a globally responsible actor and promoter of international cooperation. These questions had the greatest percentage of "no opinion" answers. Memberships in international infrastructures were considered to have the most impact.

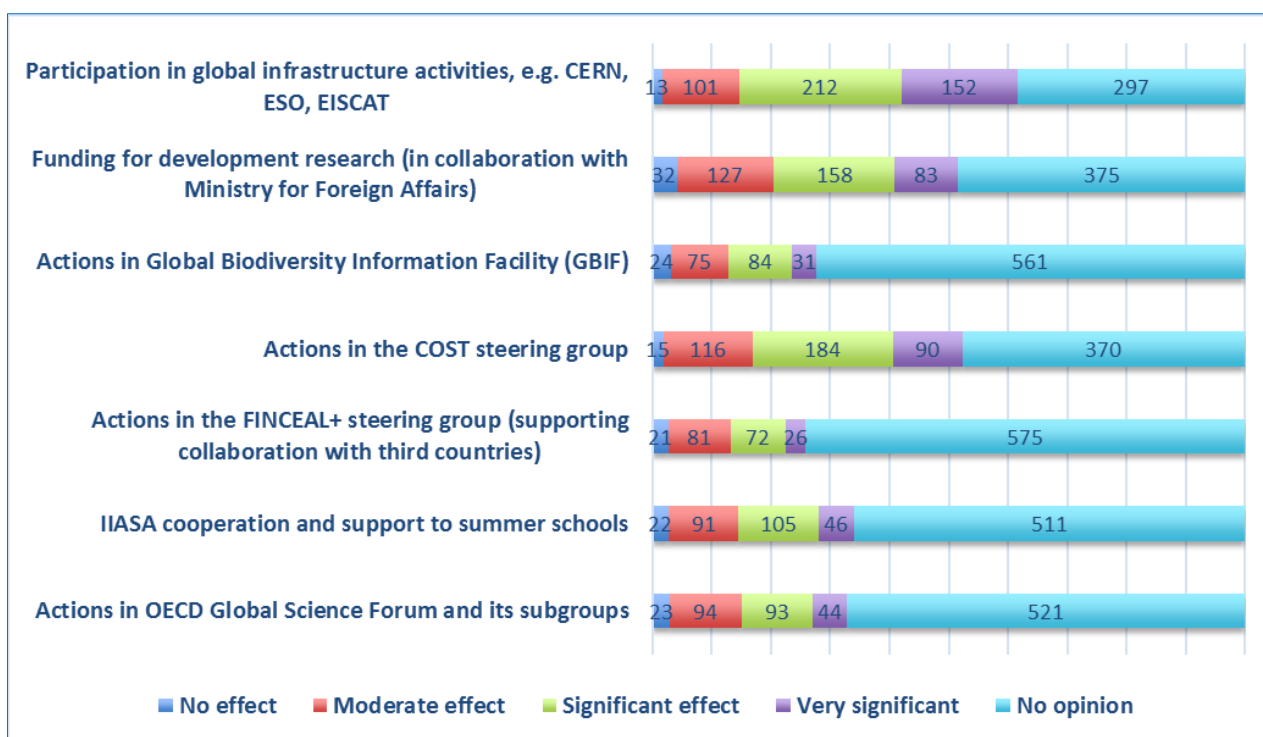


Figure 11. Stakeholder (N = 775) evaluations of the Academy's activities for promoting international engagement and cooperation in Role 5: "The Academy of Finland also supports global responsibility and promotes international cooperation and science diplomacy".

The survey also asked respondents to state their views on three potential future scenarios set in 2037 and on the Academy's roles in the promotion of international engagement and cooperation in these alternative futures. The purpose of this exercise was to determine which roles and actions would be the most vital regardless of the development of science and the framework for its pursuit.

The answers demonstrate that, in any of the three future scenarios, the Academy's roles as a funding organisation, advocate in international forums and supporter of international funding applications were regarded as the most vital. On the other hand, the other two roles were also seen as fairly important in different scenarios.

The respondents were also asked to make other suggestions to the Academy for the promotion of international engagement and cooperation in research. More than 300 (233 in Finnish and 79 in English) free-form answers were received for this question. The most important message conveyed to the Academy in the open answers was that the promotion of international engagement and cooperation must not be an end in itself, but rather a means for the promotion of high-quality research. Many respondents expressed their support for the Academy's current policy for the support of international engagement and cooperation, with support for researcher mobility and research programme cooperation with research funding organisations from other countries cited as examples.

International mobility was by far the most common subject of comments. It would seem that the mobility requirement added to the posts as Postdoctoral Researcher and Academy Professor was behind most of these comments. The most common message was that requiring physical mobility is outdated, as connections can be

formed through short visits or via Skype or other communications methods. The combination of long-term mobility and family life was felt to be difficult, and greater financial support for such mobility was requested. Several other wishes related to mobility were also conveyed to the Academy: The mobility of professors should also be supported; the FiDiPro instrument should be reinstated; returning from abroad should be made easier; short visits to and from Finland should be supported more and in a more flexible manner. Some respondents stated that the Academy's current instructions concerning the use of funding are unclear. In contrast, others expressed a desire that the Academy should more closely monitor how universities interpret the instructions.

The remaining themes raised in the open comments were diverse and varied. For example, some respondents hoped for Academy funding for foreign research partners since this would better enable genuine collaboration in research. Cooperation between funding organisations was considered important, and respondents desired its extension both thematically and geographically. On the other hand, some answers emphasised that international engagement and cooperation should be researcher-driven.

4.2 Questionnaire for recipients of joint EU funding

In summer 2016, the Academy of Finland conducted a study of Finland's participation in European cooperation networks of public funding organisations or Public-Public-Partnership (P2P) networks, which include ERA-NETs, Joint Programming Initiatives (JPIs) and Article 185 networks (see Chapter 3.4). As a follow-up to the study, the Academy surveyed the views of researchers who had received Academy funding in such calls on the added value and benefits provided by P2P cooperation. The questionnaire was sent in English to 115 researchers and 36 answers were received. The respondents had experience of 13 networks (7 project coordinators and 29 partners). They were requested to comment on the success and impact of P2P-funded projects in comparison to the Academy's other funding schemes of which they had experience.

As illustrated in Figure 12, most respondents considered P2P funding to be important for international research cooperation. Compared to other forms of national funding, co-funded calls enabled more involved and efficient cooperation, provided access to wider expertise and brought new perspectives to the framing of research questions. Cooperation also improved the discussion of extensive and socially significant research subjects and the impact of results. Networking and researcher mobility were seen as a vital foundation for future cooperation.

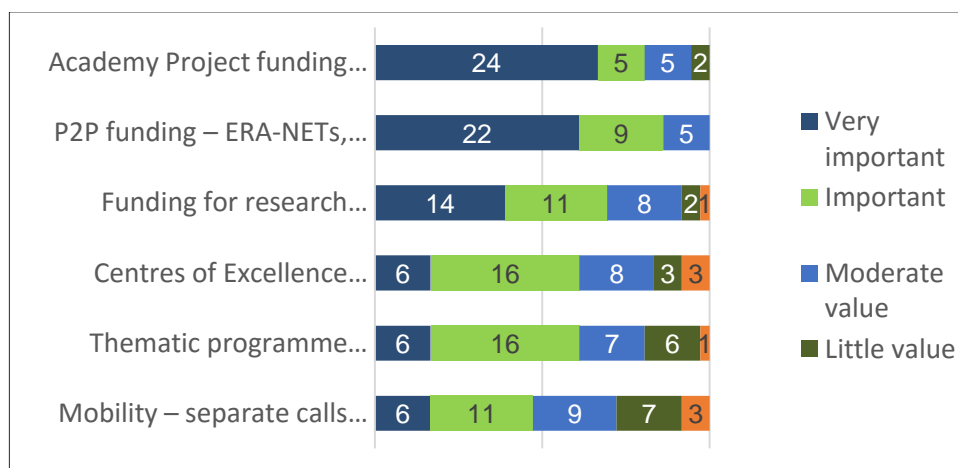


Figure 12. P2P-funded researchers' views on how the Academy's funding schemes support international research collaboration.

5 Summary

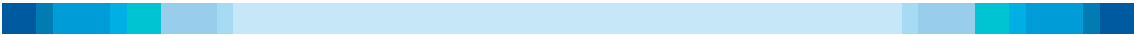
This background memorandum for the Academy of Finland's international policy has been drawn up to provide an extensive picture of the Academy's current roles and actions for promoting international engagement and cooperation in research and, thus, to support the drafting of the policy. Five roles, presented in Chapter 2, were identified during the preparation. Even based on volume alone, the most significant of these is the Academy's role as a provider of funding for research and, at the same time, international cooperation and mobility. Four other roles were also identified: supporter of international funding applications, advocate and promoter of opportunities for Finnish research in international forums, producer of knowledge and promoter of research visibility, global responsibility and international cooperation.

Chapter 2 described the goals to which these roles contribute. Chapter 3 in turn described the activities entailed by these roles, that is, what the Academy does, with whom and with what resources. Most of the Academy's activities for the promotion of international engagement and cooperation serve several purposes and roles (see Appendix 1). The purpose of international application reviews, for example, is to ensure that the Academy only funds internationally competitive research. At the same time, the international reviewers gain an extensive understanding of Finnish research and can promote its visibility through their own research activities and contacts.

Most of the actions are decided on by the Academy Board, but certain duties, especially those related to the EU Framework Programme for Research and Innovation and memberships in international infrastructures, have been assigned to the Academy by higher authorities.

Actions for the promotion of international engagement and cooperation can also be reviewed according to their target groups. The Academy's key target groups are individual researchers and research teams and organisations, but sometimes the Academy's activities serve the wider national interest, such as awareness of the Finnish research and innovation system or the general maintenance of good international relations. Correspondingly, the impact of the same measure can be high on one target group and low on another. For example, the Academy's dedicated mobility grants for non-European countries are undoubtedly significant to the work of researchers who have received such grants and have national importance for the maintenance of good collaborative relations, but their significance is probably rather low from the perspective of the background organisations when compared to, for instance, the Academy's project and research career funding.

To reach the target groups of the Academy's actions for the promotion of international engagement and cooperation and to receive feedback on the appropriateness and impact of the Academy's current roles and actions, the Academy sent an electronic questionnaire to its stakeholders in December 2016. The recipients included researchers, research organisations, ministries, other research funding organisations and other operators in the field of research, development and innovation (see section 4.1). The same survey was also sent to members of the Academy's elected bodies and experts employed by the Administration Office to determine the differences in the views of the Academy's target groups, decision-makers and employees. The results of the questionnaire show that the Academy's role as a provider of funding is assigned the greatest importance, but its other roles are also considered important. There were no significant differences in the views of stakeholders and the Academy's decision-makers and Administration Office.



Responses to the imaginary future scenarios presented in the questionnaire indicate that the scientific community considers international funding cooperation and support for international funding applications to be almost as important as the Academy's role as a provider of funding – no matter what the future holds. The free-form answers contained many comments on the questions related to international mobility.

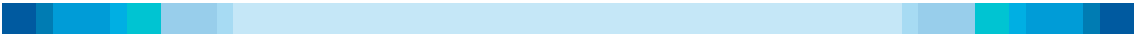
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International engagement and cooperation have always been a good way of improving the level of research, learning new methods and building networks that have a long-term impact on research cooperation and lead to significant results and high-quality publications. The promotion of international engagement and cooperation to support the quality and impact of research and the renewal of science, together with research organisations and other funding providers, is a basic value and premise for the Academy's activities. The best Finnish science is already on an international standard and does not require "internationalisation". However, the Academy plays a vital role in supporting and deepening international engagement and cooperation. The international review of research funding applications seeks to ensure the high quality of research performed in projects, while simultaneously making sure that the planned international dimension genuinely supports each project's goals. Several of the free-form answers received for the survey emphasised that the international dimension should be viewed as a tool for improving the quality of research, not as an end in itself.

The Academy's most significant form of support for international engagement and cooperation is implemented through its basic funding instruments, i.e. Academy Projects, research career funding, Centres of Excellence and Academy Programmes. It is estimated that approximately 25 per cent of such funding is channelled to support international engagement and cooperation each year, particularly to mobility and hiring foreign researchers. In these schemes, the researchers and research teams are free to decide on the forms and directions of international engagement and cooperation. The survey answers demonstrated that research career funding is an especially important enabler of international engagement and cooperation.

The societal conditions for science have changed, and these changes have had an impact on the forms of international engagement and cooperation. For example, digitalisation may reduce the need for physical mobility: meetings can be held through a video connection and materials are available online. This development was raised in several of the open answers to the stakeholder survey. However, long-term mobility still has its place in the promotion of international engagement and cooperation and high-quality research, especially for young scientists. By working in a high-quality research environment abroad, young Finnish researchers can build their own networks and become independent, which are requirements for building a successful international research career. The Academy promotes mobility of this type alongside other key players, such as research organisations, other domestic funding providers and the EU.

The Academy also provides considerable support to research environments and infrastructures, which contributes significantly to promoting international engagement and cooperation. For instance, funding for Centres of Excellence and competitive funding to strengthen university research profiles support the recruitment of researchers from abroad. The Academy's funding of national and international infrastructures has increased markedly in recent years and exceeded EUR 35 million in 2016. High-quality national infrastructures make a country more attractive to researchers. Memberships in international infrastructures (e.g. CERN and ESO), usually decided at the governmental level, provide Finnish researchers with opportunities for conducting research in the best environments and forming valuable connections and partnerships. Indeed, the Academy and the Research



Infrastructure Committee consider it vital that Finnish researchers can utilise such international memberships to their maximum potential.

As indicated in section 3.4, the Academy also engages in diverse, multilateral cooperation with other funders, with the objective of funding high-quality research on themes considered important by its partners and promoting the networking and cooperation of Finnish researchers in the Nordic countries, Europe and the rest of the world (NordForsk, ERA-NETs and JPI and Article 185 initiatives). The research councils have a key role when the Academy considers participation in such funding cooperation since they represent the best expertise on the relevance of the fields and themes in question and the state of the Finnish research community. Based on the survey answers, the Academy's stakeholders consider these forms of supporting international engagement and cooperation to be important.

The Academy is increasing its global cooperation efforts alongside other EU Member States (especially the JPIs, whose membership also includes several non-European countries). On the other hand, bilateral project funding has been cut significantly in recent years since the group of applicants for such calls is often quite small due to thematic and geographic restrictions, which makes it more difficult to achieve a sufficient standard of competition and quality. When bilateral project funding is considered necessary, it is best implemented in connection with Academy Programmes.

The Academy advocates in many international forums and organisations. Some of this advocacy is related to cooperation between funding agencies and membership in infrastructures. Measured in FTEs, the focus of the Academy's advocacy is on the Programme Committees of the EU Framework Programme for Research and Innovation, Horizon 2020. The Academy's officials serve as delegates and expert members of committees tasked with the preparation of work programmes. It is vital to influence these programmes to make the funding calls relevant to the Finnish body of researchers and ensure the suitability and functioning of EU instruments and practices. Many expert members of these committees are simultaneously Horizon NCPs that provide special support to the research services of research organisations in questions of applying for EU funding.

When representing Finland in the EU or, for example, UNESCO, the OECD or sector-specific international organisations, the Academy also seeks to promote global responsibility and good international relations. The integrity of research, open science and sustainable development are particularly important themes for the Academy. The visibility of Finnish research and the Finnish research system is naturally also promoted in the same forums.

Appendix 1. Roles and activities of the Academy of Finland for promoting the international dimension of Finnish research

| Academy's role | 1. Provider of funding for research, researchers, networks, research environments and their international dimensions | | 2. Supporter of international funding applications | 3. Promoter of Finnish research opportunities in international forums | 4. Producer of knowledge and promoter of research visibility | 5. Promoter of global responsibility and international cooperation |
|--|--|--|---|---|---|--|
| Activities included in the role | <p><i>Bottom-up: researcher/research team chooses the form of international cooperation on which the funding is spent</i></p> <ul style="list-style-type: none"> - Academy Projects - Academy Professor, Academy Research Fellow and Postdoctoral Researcher projects - Centres of Excellence - SRC projects - Academy Programme projects - Competitive funding to strengthen university research profiles | <p><i>Top-down: international partner countries and/or theme specified</i></p> <ul style="list-style-type: none"> - NordForsk - ERA-NETs - JPIs - Bilateral international calls - Mobility grants - ESFRI infrastructures - Academy Programmes and SRC programmes - Funding for development research - Funding for Antarctic research | <ul style="list-style-type: none"> - Academy funding can be used to submit applications - Horizon 2020 NCPs - ERC interview training - SRC matching funds for Horizon 2020 - Identification of EU application possibilities and their communication as part of Academy Programme and SRC programme activities - ERA-NET and COST networks | <ul style="list-style-type: none"> - Committee work in the EU framework programme and other EU advocacy - Infrastructure membership treaties - ERIC memberships - JPI memberships - EMBO, EUI, COST, OECD - NordForsk and Nordic NOS committees - EU20 subcommittee - Finnish R&D Liaison Office in Brussels - Science Europe and its working groups - International visits and reception of international visitors (bilateral cooperation) | <ul style="list-style-type: none"> - Awareness of the international level of research <ul style="list-style-type: none"> • International panellists • Committees • Analyses of the state of science - Knowledge of the science policy, R&D systems and science policy actors of other countries - Maintenance of relations with affiliated organisations (research councils, Science Europe, NordForsk, ESFRI) | <ul style="list-style-type: none"> - JPIs - CERN, EISCAT, ESO (infrastructures with scientific-diplomatic roles) - IIASA - UNESCO - ERA-NETs - FinCeal - Funding for development research - International visits and reception of international visitors - Promotion of the integrity and openness of science and sustainable development |

Appendix 2. Evaluation of resources spent on the promotion of international engagement and cooperation

The Academy of Finland promotes international engagement and cooperation in research through its funding instruments and the work of its Administration Office.

The Academy supports international engagement and cooperation by funding researchers, research, research environments, mobility and membership fees at an estimated amount of EUR 140 million each year (Table 1). A significant part (EUR 61.3 million or 43%) of the funding for the promotion of the international dimension of research is implemented through Academy Projects, research career funding, Centres of Excellence and Academy Programmes.

Approximately EUR 36.2 million (26% of all such funding) is spent annually on the Finnish Research Infrastructure Committee's funding for the promotion of international engagement and cooperation and on the funding of international research infrastructures. The proportion of strategic research funding and competitive funding to strengthen university research profiles is approximately 21% (EUR 29.8 million).

Table 1. Estimate of the Academy's annual funding for promoting international engagement and cooperation in research

| Funding schemes that promote international engagement and cooperation | Average annual amount |
|--|------------------------------|
| Academy Projects and research career funding (estimated at 25% of total funding) | 51,100,000 |
| International research infrastructure membership fees | 19,500,000 |
| SRC programme projects (estimated at 25%) and SRC matching funds for Horizon 2020 | 17,300,000 |
| Research Infrastructure Committee funding for the promotion of international engagement and cooperation (estimated at 90%) | 16,700,000 |
| Competitive funding to strengthen university research profiles (estimated at 25%) | 12,500,000 |
| Centres of Excellence and Academy Programmes (estimated at 25%) | 10,200,000 |
| Funding cooperation under ERA-NET, JPI and Article 185 | 5,800,000 |
| Research and mobility funding for bilateral agreements | 4,200,000 |
| Antarctic, development research, EUI and IIASA funding | 2,600,000 |
| Nordic NordForsk and NOS cooperation | 1,500,000 |
| Total | 141,400,000 |

Approximately 10 per cent (EUR 14.1 million) of this funding is directed at special funding schemes for the promotion of international engagement and cooperation, such as multinational, Nordic or bilateral cooperation between funders. In addition to the administrative work entailed by these funding schemes for the promotion of international engagement and cooperation, the Academy uses approximately 15 FTEs of human resources on, for example, EU project counselling, committee work in the EU Framework Programme for Research and Innovation and other EU advocacy and administrative tasks entailed by representing Finland in international research infrastructures each year.