

COST Strategic Plan

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Preamble

The adoption of the COST Ministerial Declaration [1], elaborated by the COST Vision and Strategic Goals [2], during the 2016 COST Ministerial Conference in Bratislava delivered a strong political mandate for COST for the coming years. The COST Vision and Strategic Goals provides insights into the future direction of COST. The current COST Strategic Plan translates these goals into defined and prioritised operational objectives, expected impact, required activities, tools and potential cooperation partners. The COST Strategic Plan is implemented by an Annual Activity Plan, which details the activities in order to realise the expected outcomes and results.

The COST Strategic Plan builds on the COST FP9 Position Paper [3] highlighting the importance of interdisciplinary bottom-up networks as impactful tools to bridge the participation gap and close the innovation divide in Europe and providing opportunities for younger generations. It also follows-up on recent developments in research and innovation policies at European level, in particular the *DG R&I's 'three O's' priorities: Open Science, Open Innovation, Open to the World*, [4] and the increased focus on impact, as stressed by European Commissioner Carlos Moedas, the “Lap-Fab-App” report [5] and the “2017 Tallinn Call for Action” [6].

This Strategic Plan has been prepared in different stages. In January and March 2017, three workshops were organised in order to collect the views of the members of the COST Committee of Senior Officials (CSO), the Scientific Committee (SC), the European Commission (EC) and the COST Administration. The draft resulting from this process was discussed during the CSO meeting in April 2017, after which a Written Procedure was launched in order to collect feedback. During its meeting on 28 June 2017, the COST Executive Board mandated a Drafting Group with the task to finalise the COST Strategic Plan, building on previous workshops and discussions. The Drafting Group met four times in the course of August and September 2017, and presented the COST Strategic Plan during the 201st CSO meeting of 18-19 October 2017 in Tartu, Estonia. During the 202nd CSO meeting in Brussels on 12 December 2017 in Brussels, Belgium, the COST Strategic Plan was approved by the COST Members. The COST Strategic Plan covers the period from 13 December 2017 until the end of FP9. It is a dynamic document, with the ability to be adapted during its lifetime. As the content and budget of FP9 is not yet known, the COST Strategic Plan is of course conditional of its compatibility with the future tasks and frames for COST in FP9.

Executive Summary

COST's interdisciplinary bottom-up networks are effectively bridging the innovation divide and participation gaps in Europe and are providing a large spectrum of opportunities for young generations of researchers and innovators. Involvement in COST Actions both anticipates and complements the activities of the EU Collaborative Framework Programme (FP), spreading excellence across Europe and beyond. To continue as the leading networking instrument in the ERA, and in line with the COST Vision and Strategic Goals, COST has defined three priorities for its positioning in the remaining part of Horizon 2020 and FP9, the next Framework Programme for Research and Innovation: 1) Promoting and spreading excellence, 2) Fostering interdisciplinary research for breakthrough science, 3) Empowering and retaining young researchers and innovators.

Pockets of excellence can be found everywhere in Europe and COST has the tools and instruments at its disposal to unlock the untapped potential, creating a win-win situation for Europe as a whole. COST encourages participation from all actors, such as academic, non-academic, SME's, international organisations and public authorities. Participation in COST has led to significant results and follow-up in terms of the number of submitted proposals for collaborative research in Horizon 2020, with a striking success rate, more than doubling common success rates for these programmes. This underpins the role of COST as a pre-portal for follow-up European funding for research and innovation. By networking researchers and innovators from all career levels, from PhD students to Nobel Prize winners, COST connects complementary funding schemes ranging from Erasmus+ all the way to European Research Council (ERC) Grants, facilitating entry of promising young talents into these schemes.

The COST Strategic Plan defines clear targets and Key Performance Indicators for each strategic priority. Several instruments are at hand to monitor and measure the outputs, tangible results and scientific impact of COST Actions. COST will contribute to the European political goal of enhancing research and innovation excellence, mobilising the untapped potential, encouraging openness and thus boost the European scientific, economic and societal development.

To implement the strategic priorities, COST will strengthen its core business by expanding the number and reach of COST Actions. New services, including COST Connect and the COST Academy are offered to strengthen the position of COST and its Actions in the ERA. COST has also the ambition, through its community involved in COST Actions, to contribute expertise to science-informed policy advice as well as to the *Open to the World* Policy.

A COST Innovators Grant scheme for exploring innovation potential will be developed to further bridge scientific research performed in COST Actions and marketable applications. Cross-cutting Activities will be deployed to utilise COST's networking instruments for targeting specific policy priorities. COST also recognises a number of opportunities for further contributing to the Spreading Excellence and Widening Participation package in Horizon 2020 and FP9 [7, 8, 9].

A strong need exists for an increase in budget to successfully implement COST's three Strategic Priorities. A Financial Framework and budget of at least EUR 600 million (EUR 85,7 million per year) will enable initiating up to 75 new COST Actions per call, reaching 625 Actions per year with a success rate of 15% for submitted proposals, whereas at present 75% of the proposals rated as excellent cannot be funded due to lack of budget. With this increase in budget, and in line with the Lamy Report "Lab-Fab-App", COST will be able to offer enhanced networking opportunities to even more researchers and innovators, making a tangible contribution to bridging the innovation divide and participation gaps in Europe and beyond.

1. COST: The Leading Open Networking Tool in the ERA

For more than 45 years, COST has offered European researchers and innovators a simple and flexible pathway to take part in the best science and technology networks in Europe and beyond. To this end, COST has been providing funding for bottom-up, excellence-driven, interdisciplinary, open, pan-European networks (the COST Actions). These networks enable a very large spectrum of cooperation, including capacity building and training activities. The COST Actions produce a wide range of outcomes from joint publications, to successful proposals to the ERC, or large collaborative EU projects and new technology developments aimed at addressing Europe's societal challenges. COST Actions gather researchers and innovators from all career levels, degrees of specialisation and professional backgrounds, embracing the whole of Europe's cultural diversity and core values.

COST is the longest-running European framework for research and innovation, presently constituted by 36 COST Members and 1 Cooperating State, whilst 17 Near Neighbour Countries (NNC) covering Europe and its adjacent areas are also eligible for funding. The 20 'less research intensive' COST Members are listed as Inclusiveness Target Countries (ITCs, Figure 1, in green).

Researchers and innovators from all over Europe perceive COST as a unique means for them to jointly develop their own ideas and new initiatives across all fields in science and technology, including social sciences and humanities, through pan-European networking of national or international funded research activities. Involvement in COST Actions both anticipates and complements the activities of the EU collaborative FPs, constituting a "bridge" towards the research and innovation communities in Europe and beyond. Through its networking instruments (Figure 2), COST promotes breakthrough knowledge in interdisciplinary topics, and spreads excellence across Europe and beyond. COST fosters brain-circulation, especially of younger generations, and offers researchers and innovators multiple possibilities to develop their careers through collaborative networks. COST can also stimulate reforms in national research and innovation systems. In its essence, COST offers a unique space where people and ideas grow, constituting a solid bridge between different research and innovation communities in Europe and beyond.

- **36 COST Members**

Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, The Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and the former Yugoslav Republic of Macedonia.

- **1 Cooperating Member**

Israel.

- **Near Neighbour Countries participation**

Albania, Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Lebanon, Libya, Moldova, Morocco, the Palestinian Authority, Russia, Syria, Tunisia and Ukraine.

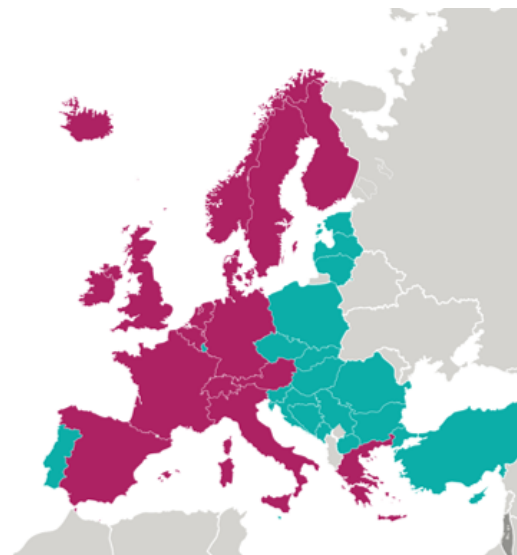


Figure 1. Overview of COST Members, COST Cooperating Member and NNC. The 20 Inclusiveness Target Countries (ITCs) are marked in green. The remaining 16 countries are marked in red. NNC participating in COST are marked in grey.

In 2016, more than 48 000 researchers and innovators were involved in 352 COST Actions, 258 training schools were organised and 2 705 short-term scientific missions took place (Figure A1). Since the start of Horizon 2020 in 2014, 60 247 participants have been involved in 499 COST Actions, of which 16 457 coming from ITCs. COST organised 10 229 short-term scientific missions, and 897 training schools took place since 2014. On average, the participation of young researchers and innovators in COST Actions is 40%, while the participation of female researchers and innovators has increased to 42% in 2017.



Figure 2. Overview of COST's current networking instruments.

2. The role of COST in the ERA – 3 Strategic Priorities

COST has been nourishing open networks of excellence in all scientific domains, where knowledge is freely shared among all types of specialists, promoting both the traditional academic freedom for curiosity-driven research and technical and market-oriented solutions. It has established itself as a platform where people and ideas can grow, contributing decisively to the internationalisation process of the research and innovation communities and to significant scientific and technological breakthroughs in Europe and beyond. In order to continue to be the leading networking instrument in the ERA, and in line with the COST Vision and Strategic Goals, COST has defined three priorities for its positioning in the remaining part of Horizon 2020 and in FP9:

- Promoting and Spreading Excellence
- Fostering interdisciplinary research for breakthrough science
- Empowering and retaining young researchers and innovators

Under the current framework programme (Horizon 2020) COST is funded with 50% by the programme 'Spreading Excellence and Widening Participation' (SEWP) and has committed to spend 50% of the budget at the benefit of researchers from widening countries eligible under SEWP (equivalent to COST Inclusiveness Target Countries, ITC). For the future programming period (i.e. under FP9) COST is to be expected to be fully integrated into the successor programme of SEWP alongside with other instruments such as Teaming and Twinning. Consequently, 80% of its budget will be devoted to widening actions and 50% of its budget will be invested in widening countries (ITC).

2.1 Promoting and Spreading Excellence

Excellence is everywhere. COST's open and bottom-up nature has been contributing decisively to create an attractive ecosystem for all types of researchers and innovators. All participants in COST Actions are real beneficiaries, regardless of their career stage, country of origin or areas of interest. What is also evident is the capacity of COST to operate in an inclusive manner, taking advantage of Europe's diverse, multicultural and highly skilled population. In doing so, COST connects Europe's "pockets of excellence", providing structural support to ERA, widening the research and innovation base in Europe and promoting cooperation in science and technology with other countries beyond COST's current membership. Thus, COST is also instrumental to bridging the research and innovation divide and participations gaps in Europe.

At the core of COST is research and innovation excellence. But at the same time, COST is building a strong critical mass which constitutes an essential precondition for the generation of breakthrough science. To this end, COST has developed simple and low-barrier processes for universal access to networks of excellence, providing new participants with a highly rewarding start-up package into the research and innovation world. This concept of mutual benefit is an integral part of every COST Action and highly valued by COST participants (Figure 3). It is obvious how small communities in geographically dispersed regions benefit from cooperating with experienced and renowned researchers and innovators from leading academic institutions or SMEs. However, it is important to highlight the dynamic equilibrium that is established in any COST Action. Connecting the top performers to others in the same or complementary areas of science and technology maximises the production of new knowledge, and more importantly, breakthrough discoveries.

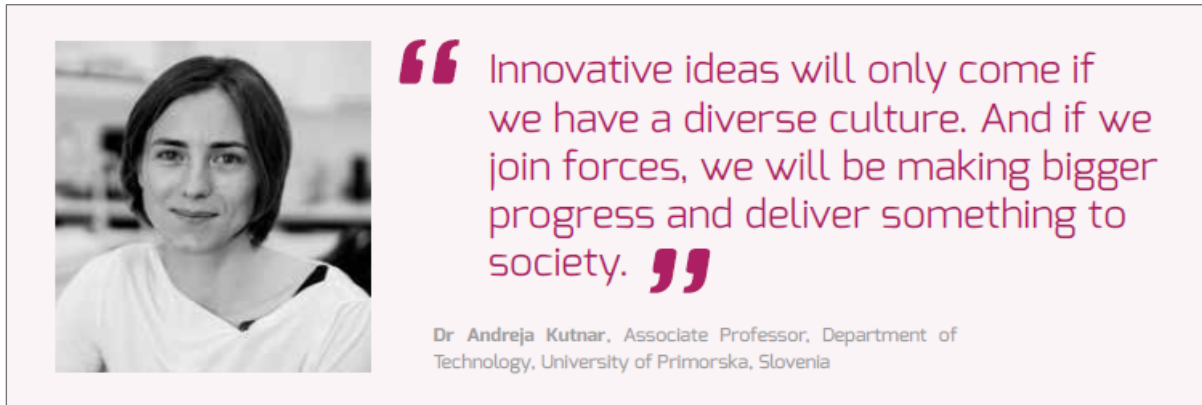


Figure 3. Example of a personal success story benefiting from participation in a COST Action.

ITCs are dominant actors in various scientific and technological areas, and COST networking activities allow for a healthy knowledge exchange and the consolidation of Europe’s top performers in unanticipated research and innovation domains. Highly skilled human resources are spread all over Europe, and top performers can achieve their goals faster by linking them with high-end infrastructures. COST networking activities encourage brain circulation and in many cases, researchers and innovators return to their institutions of origin, empowered with new ideas and linked into a network that will last beyond the COST Action lifecycle. As a result, the mutual benefit driven by COST Actions contributes positively to closing the research and innovation divide in Europe, and allows for the full realisation of Europe’s potential in research and innovation (Figure 4).

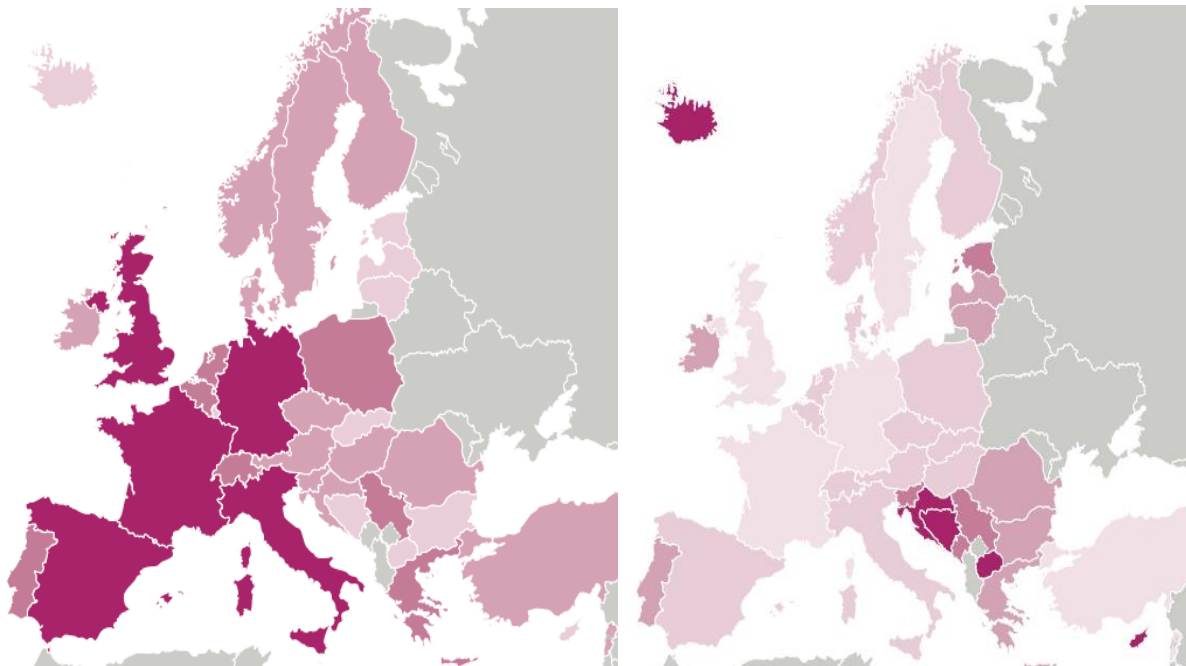


Figure 4. Participation levels of the 36 COST Members and Cooperating Member, based on COST key figures of 2016 given in Figure A1. On the left, the absolute number of research participating in COST Actions is shown. Higher absolute participation levels are marked in darker shades of red. On the right, the number of participants in COST networking activities compared to the size of the research community (measured in Researchers in Full Time Equivalents, ESTAT) is displayed. Here, higher relative participation levels are marked in darker shades of red.

Participation in COST activities is an entry point to the often more closed European collaborative research networks, as illustrated in Figure 5, saving costs and time to connect with the right partners. Pockets of excellence can be found everywhere in Europe, and COST has the tools and instruments at its disposal to unlock the untapped potential, creating a win-win situation for Europe as a whole.

Dendrolab, Serbia

Scientists in Serbia are experiencing an improvement in their situation thanks to cooperation and collaboration with their counterparts across Europe. “Since Serbia is still not part of the EU, we have fewer scientific and travel opportunities compared to colleagues from EU countries” says Dr Orlović. “Valuable international contacts are the key benefit of our participation in COST Actions,” adds Dr Orlović, a Professor at the Faculty of Agriculture and Head of the Institute of Lowland Forestry and Environment at the University of Novi Sad. “Especially contacts with scientific institutions in the forestry sector which we would never have been able to get any other way.” The Institute has taken part in different COST Actions over the last decade, with the most prized fruit of their endeavours being Serbia’s first Dendrolab. It’s a laboratory for tree ring research based around a system called ATRICS that scans tree cores in very high resolution. It was inspired by Dr Stojanović’s first short-term scientific mission to the Slovenian Forestry Institute in Ljubljana in 2013 as part of the COST Action ‘Climate Change and Forest Mitigation and Adaptation in a Polluted Environment’.



Figure 5. Success story on how COST closes the innovation divide in Europe.

As a contribution to the inclusiveness objectives of the FPs for R&I, COST has been strongly dedicated to increase the participation levels from peripheral regions. This is clearly highlighted in Figure 4 (see above, map on the right): The participation in COST Actions from researchers coming from ITCs is remarkable, reaching on average 10% of their research communities¹, compared to 2,4% in the other COST Members. It should be noted that the research communities from the 20 ITCs represent an estimated 20% of the total number of researchers of the 36 COST Members and Cooperating State. The success of COST is illustrated by the example of Malta and Cyprus. Both ITCs have record participation levels compared to the size of their communities, with an estimated 1 out of 3 researchers and innovators benefiting from COST in 2016, but the absolute size of their communities translates into a participation level of less than 50% of the running COST Actions. However, the figures provide a different perspective when the absolute number of researchers participating in COST Actions is shown (see above, Figure 4, map on the left).

The dimension of the communities in ITCs obviously provides a limiting condition for growth in their participation. Nevertheless, COST’s continuous efforts at connecting researchers and innovators from

¹ EUROSTAT reference to Number of Researchers in Full Time Equivalents

ITCs are well reflected in Figure 6: at the end of FP7 (in 2013), the average number of countries in a COST Action was ca. 24,5, with 60% non-ITCs and 40% ITCs; in 2017, each COST Action had on average ca. 27,5 countries per Action, with 52% non-ITCs and 48% ITCs.

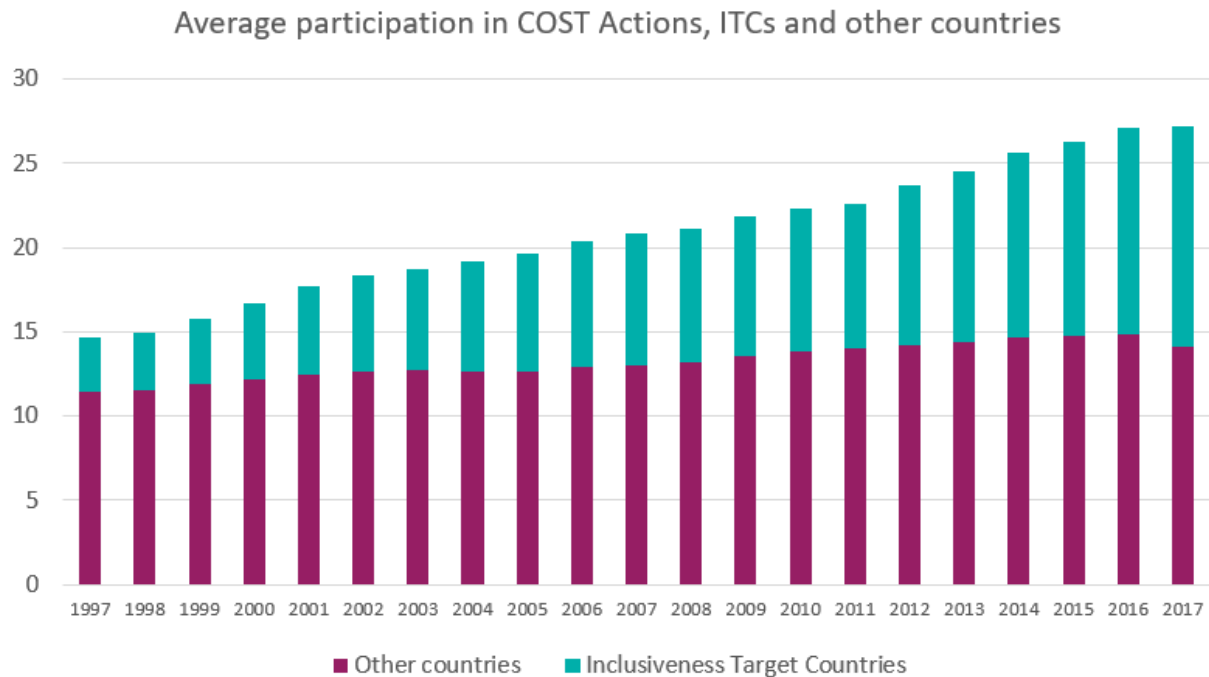


Figure 6. Average number of countries participating in a COST Action from 1997 to 2017. For each year, the number of ITCs (in green) and the number of non-ITCs (in red) is highlighted.

Global Partnerships

COST directly contributes to the internationalisation process of the research and innovation communities. COST networks are open to all participants, not only COST Member countries but also the NNC and International Partner Countries (IPCs) (Figure 7). In its full potential, COST aggregates worldwide contributions and a global exchange of research skills among all its participants, lowering the pressure for the common use of resources and increased mobility of human resources. In July 2017, 275 institutions coming from IPCs participate in 115 running COST Actions (33% of the COST Actions), while 243 institutions from NNCs participate in 112 running COST Actions (32% of the COST Actions). Institutions coming from NNCs receive a top-up on the Action budget to cover the expenses of the involved participants.

With regional and international cooperation high on the agenda, it is foreseen that these numbers will increase, through centralised dissemination of COST in targeted areas of the globe.

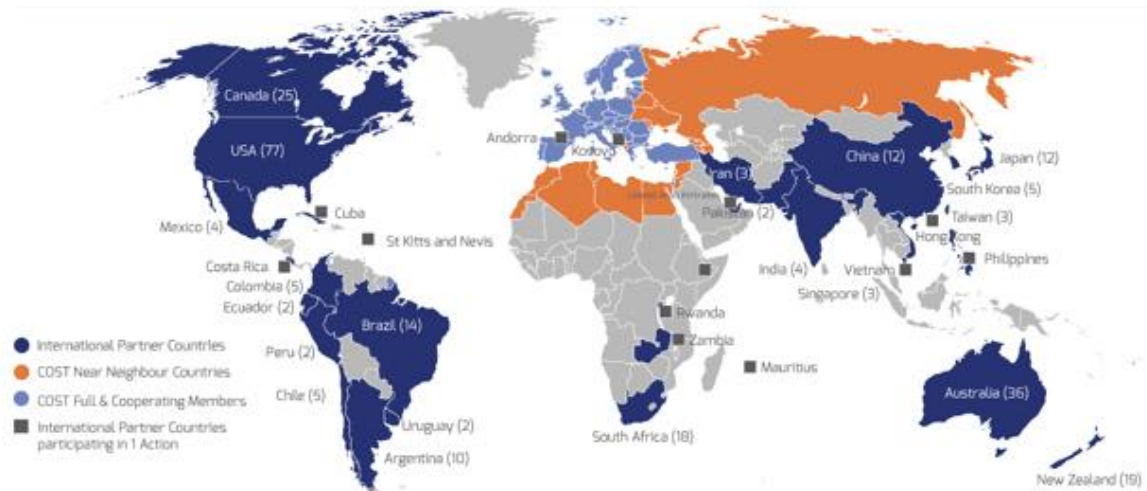


Figure 7. Number of individual participations from IPCs in the activities of running COST Actions (data from the end of 2016). 275 institutions from IPCs participated in running COST Actions in 2016. Further detailed information concerning the participation of NNCs is given in Figure A2.

2.2 Fostering interdisciplinary research for breakthrough science

Cooperation across disciplines and different areas of science and technology are an essential precondition to achieve real breakthroughs in research and innovation [6, 10, 11]. The interactions and encounters of researchers and innovators from different disciplines leads to cross-fertilization of ideas and knowledge that enrich and foster the academic debate. Interdisciplinary research often results in discoveries, innovations and breakthroughs that are crucial in the ambition to boost jobs, economic growth, investments, and improve the quality of life of Europe's citizens and the environment.

COST activities are clear examples of putting the concept of interdisciplinary research into action (Figure 8). Within the COST Actions, open networks of excellence are created in all scientific fields, and knowledge is freely shared among all types of specialists. The open and bottom-up nature of the COST networking-activities allows researchers and innovators the freedom of thought and attracts contributions of various science disciplines, leading to options for solutions to societal challenges (Figure 9). COST Actions are characterised by their pluralism and heterogeneous nature, both in research and innovation fields, participants and in activities, as is shown in Figure 8 for 35 newly approved COST Actions following open call 2016-2. Currently, more than half of the COST Actions have an interdisciplinary nature, a number that increased since the launch of the bottom-up and open process of receiving and selecting proposals in 2014.

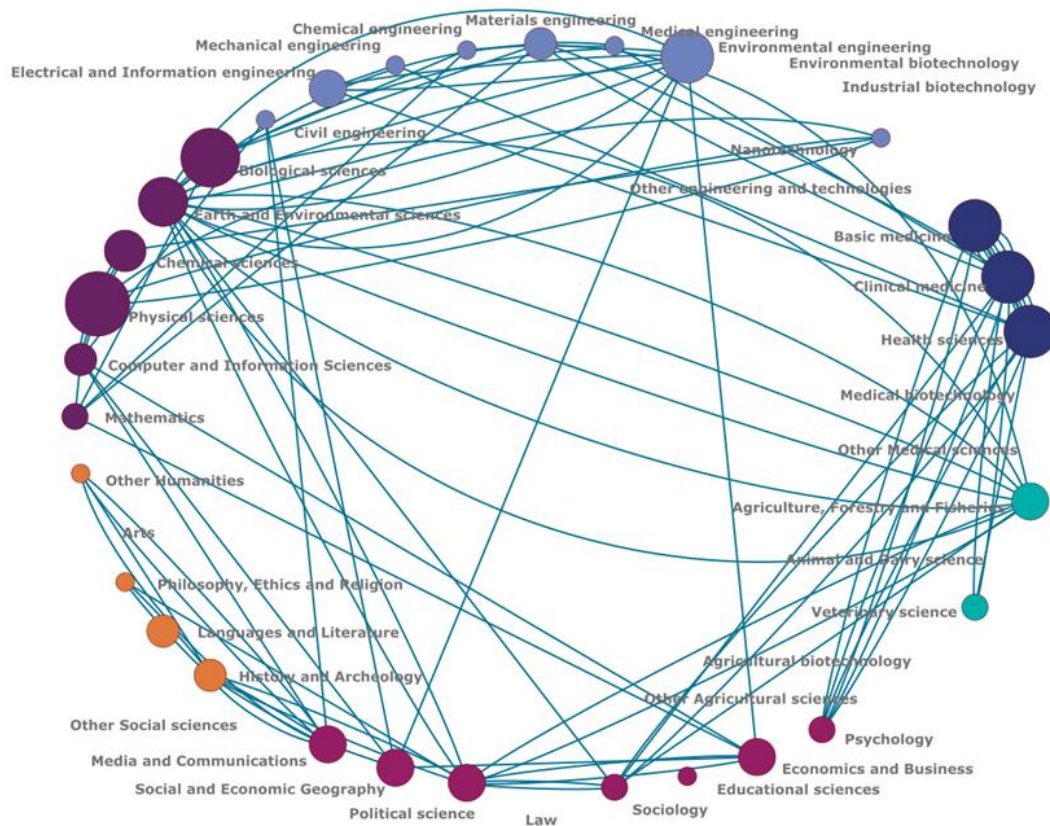


Figure 8. Illustration of the interdisciplinary nature of 35 newly approved COST Actions following open call 2016-2, where every colour represents a different research field. Figure A3 provides an example of the interdisciplinary nature of an individual COST Action.

MODENA

Nanoparticles are crucial components of our everyday lives. They can be found in medicine, electronics, food, fashion and energy. It is clear that engineered nanoparticles bring significant technological developments and increase the wellbeing of society. But there are also real concerns that exposure to some of these particles could cause environmental problems and harm to human health. The MODENA COST Action has brought key insights into the toxicity of engineered nanoparticles by bringing together scientists from different disciplines – like toxicology, material science and mathematics. By bringing together interdisciplinary experts, MODENA has raised awareness about the importance of an invaluable tool in nanosafety research: namely, mathematical modelling. This is significant given that the nanosafety community typically consists of biologists, and material scientists, not mathematicians. These models now have become standard regulatory tools in industries across Europe, and has resulted in new ways of looking at some of the most challenging diseases in the 21st century. For instance, by analysing the toxic nanoparticles associated with serious lung diseases, scientists now have a better understanding of the metrics of toxicity.

Figure 9. Success story on how interdisciplinary research is crucial in order to boost breakthrough science.

Moreover, the added-value of COST Actions is not limited to the networking of scientists from different domains, but also includes networking stakeholders from other sectors. The participation of actors representing the whole value chain of production and dissemination of knowledge is crucial if research and innovation aims for a tangible impact at society at large. Therefore COST encourages participation from non-academic actors such as SMEs (as shown in Figure 10), international organisations, public authorities, and civil society organisations.



Figure 10. Testimony on the importance of cross-sectoral cooperation in research and innovation.

As shown by Figure 11, participation in COST Actions has led to a significant follow-up in terms of the number of submitted proposals for collaborative research in Horizon 2020. Even more striking is the success rate of an average of 28% of these submitted proposals, outnumbering by far the common success rates in Horizon 2020, being typically of the order of 10-15%. This indicates that COST Actions act as a successful pre-portal to follow-up European funding for research and innovation, contributing to the advancement of breakthrough science.

Horizon 2020 applications reported by finished COST Actions			
Total Actions with finished Final Action Report	Submitted H2020 proposals reported	Approved H2020 projects reported	Success rate
62	230	65	28%

Figure 11. COST acting as a pre-portal to FP Funding.

COST also plays an important role in providing input to the priorities of the European FPs for R&I. Through its open, interdisciplinary and bottom-up nature, COST is an effective platform for researchers and innovators to think beyond the current research and innovation agenda's and to identify emerging research topics that sometimes are not yet addressed in the current European funding schemes.

Also on the national funding schemes, COST has an impact. The Czech Republic and Switzerland provide additional, national support for COST Action participants, with a focus on PhD students. These support schemes provide for example, a budget for personnel cost of staff assigned to the project, the cost of new equipment, and the cost of subcontracting. This additional funding is intended to further support researchers and innovators to establish broad international networks, often at an early stage in their career.

COST offers significant value for money, and creates a substantial pooling effect of national research budgets. The EU's contribution to COST is EUR 300 million within Horizon 2020, corresponding to 0.38% of the total budget of the FP. Since the beginning of Horizon 2020, COST has been able to pool EUR 2.8 billion of national research budgets. Each COST Action has an average budget of about EUR

129 000, meaning that with this budget each COST Action is able to pool more than EUR 2 million of national research budgets each year.

2.3 Empowering and retaining young researchers and innovators

Europe is currently building a next generation of researchers and innovators with great potential to contribute to Europe's prosperity. It is crucial to take advantage of the pool of talent that exists in the younger generation by offering career perspectives that will enable them to develop and exploit their full potential (Figure 12). Networks and personal contact with more experienced researchers and innovators will empower young talents and open their career perspectives.



Figure 12. COST has the ambition to boost the careers of young researchers and innovators.

COST is offering networking tools that have exactly this ambition. Participation in the COST networking activities allows young researchers and innovators to prepare and empower themselves with more self-confidence and motivation to stay in Europe for their next career steps in research and beyond. COST also promotes brain circulation within Europe through its short-term scientific missions (STSMs), limiting brain-drain from peripheral regions to research-intense regions in Europe. The focus of COST on young researchers and innovators also takes into consideration gender balance in order to ensure equal opportunities and gender-friendly career advancement. Young researchers and innovators are already well-represented within the COST Actions, as is shown in Figure 13. In both ITCs and non-ITCs, the age group between 26 and 30 years is best represented, also including the largest share of female researchers.

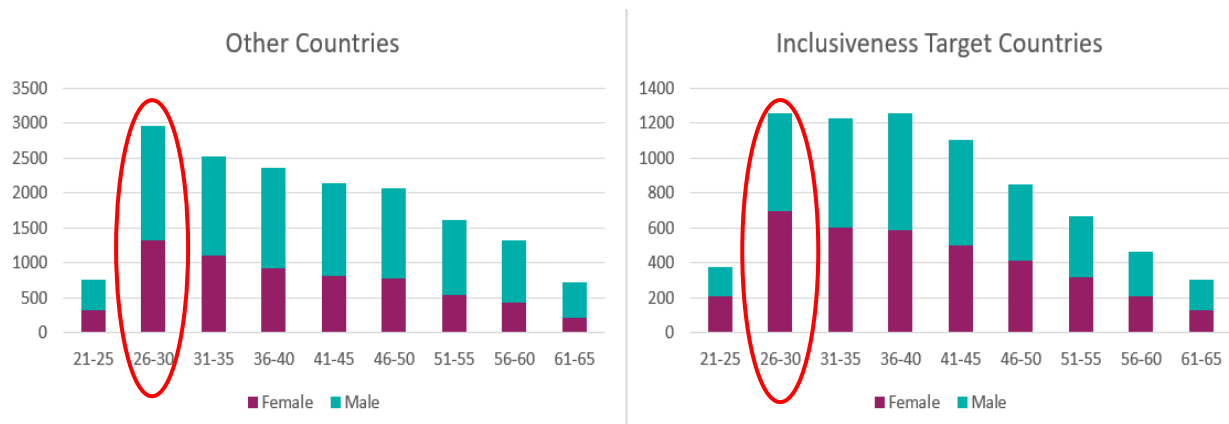


Figure 13. Participation in COST Actions by age group and gender in 2016. Figure A4 displays the steady increase in participation of female Management Committee members.

It is important for young researchers and innovators to broaden their scope and knowledge beyond their own scientific discipline, and to acquire transferrable and transversal skills. COST Actions gather researchers and innovators from all career levels, from PhD students to Nobel Prize winners. By networking them, COST also connects complementary funding schemes ranging from Erasmus+ all the way up to ERC Grants, facilitating entry of promising young talents into these schemes (Figure 14).

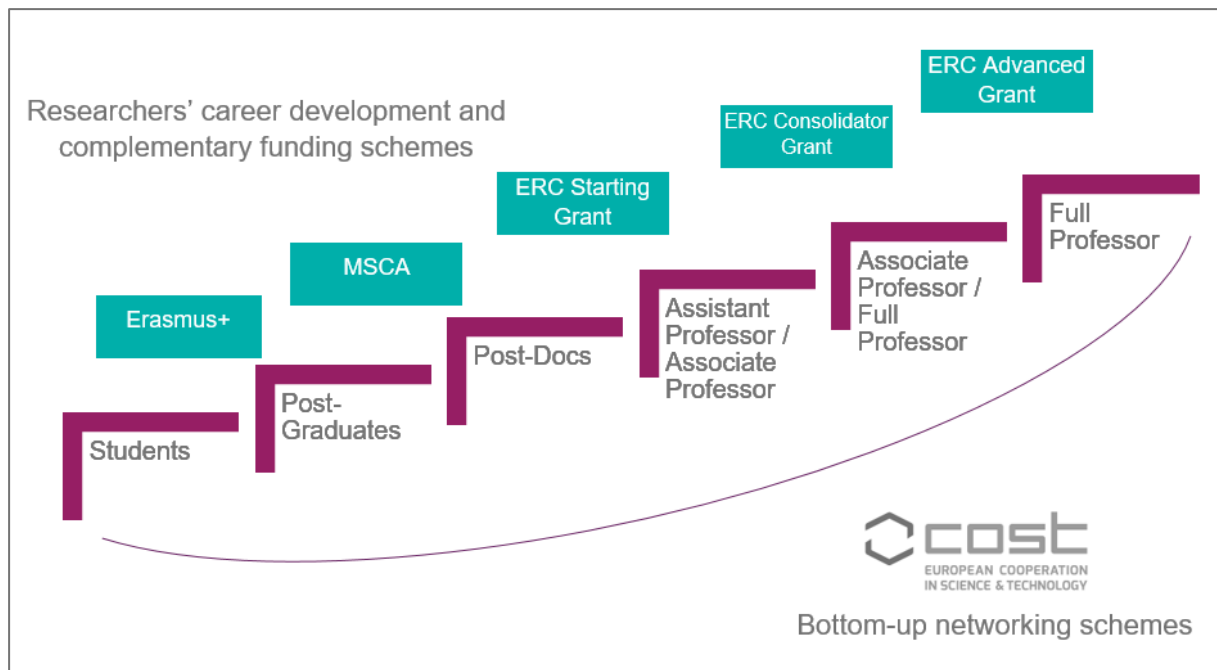


Figure 14. COST connects researchers, from PhD students in Erasmus+ and Marie Skłodowska Curie activities to ERC Advanced Grants.

3. Measuring output, tangible results and scientific impact

Targets and Key Performance Indicators (KPIs) are defined for each strategic priority with a higher ambition level compared to the current situation (Figure 15). COST has several instruments at hand to monitor and measure the impact of its activities:

- Monitoring and Final Assessment tool (MFA): The MFA contains the Actions achievements against the objectives and the potential impact it creates. The MFA gathers information both during and after the lifetime of an Action, including proposals and collaborations initiated by the Action and impacts and success stories attained by the Action. This allows COST to collect the necessary quantitative and qualitative data in order to monitor the progress in terms of KPIs.
- e-COST database: The database that is available in e-COST, and in which every reimbursed participant of the COST Actions is registered, provides important information and data that is crucial to monitor and measure several KPIs that are listed in the table below.
- Surveys (during and after ending of COST Actions): Impact assessments will be conducted, aiming to identify the medium and long-term impact of participation in COST Actions on researchers' careers and networks. Post-Action surveys will target groups of past beneficiaries of COST Actions.

To achieve the desired impact, communications will have an important role to play, both within the scientific community and to a wider audience. In order to implement these communication objectives, COST developed a Communication and Brand Strategy [12, 13] that has the aim to inform and reach out to society, addressing multiple audiences beyond the COST Action participants.

Strategic Priority	KPI	Current situation	Target for FP9	Monitoring and Measurement
Promoting and Spreading Excellence	Average percentage of COST Actions in which each ITC participates	60%	80% ²	e-COST
	% of research and innovation community in individual ITCs mobilised, if country participates in less than 80% of Actions (see KPI above)		≥5%	e-COST
	% of ITCs at proposal level	35%	≥50%	e-COST
	% of Action chairs from ITCs	8%	≥12%	e-COST
	Number of leadership positions filled by ITC participants per Action	≥1	≥2	e-COST
	% of budget devoted to widening actions	t.b.d. ³	80%	e-COST
	% of budget invested in ITCs	41% ⁴	50%	e-COST

² Some ITCs may not be able to participate in at least 80% of the COST Actions due to the size of their research and innovators community. If an ITC does not meet this target, then it must at least mobilise 5% of its community to participate in COST Actions (see next KPI in the table).

³ Calculation method for FP9 to be defined, subject to further analysis and agreement with the European Commission.

⁴ Accounted benefit to ITC participants.

Foster interdisciplinary research for breakthrough science	Percentage of Actions with 2 or more science disciplines represented	45%	55%	e-COST
	Average share of non-academic participants per Action	4%	5%	e-COST
	Average number of peer reviewed publications per Action	20	20	MFA
	Number of submitted proposals to FP9 resulting from COST Action	≥2	≥2	MFA + surveys
	Number of granted projects in FP9 resulting from COST Actions	≥1	≥1	MFA + surveys
	Number of success stories of scientific results and impact	Anecdotal evidence	Anecdotal evidence	MFA + surveys
Empowering and retaining young researchers	Share of young researchers and innovators participating in COST Actions	40%	50%	e-COST
	Share of young researchers and innovators in Action leadership position	10 to 15%	15-20%	e-COST
	Share of young researches and innovators stating that COST has boosted their career	Anecdotal evidence	85% and anecdotal evidence	Survey

Figure 15. COSTs Strategic Priorities and KPIs.

4. Implementing COST's Strategic Priorities

In order to implement the Strategic Priorities and create maximum impact, COST will strengthen its core business and implement a number of add-on instruments.

4.1 Strengthen the core business by expanding the number and reach of COST Actions

COST will continue offering the most efficient and user-friendly networking tool for researchers and innovators and remain the leading tool for science exchange in the ERA. COST will strengthen its core

business by increasing the number of COST Actions, thereby enhancing the overall capacity and impact in implementing its strategic priorities.

To respond to new needs and challenges ahead, COST will deploy virtual and digital networking tools to support its Actions, making COST a frontrunner in transforming the way scientists and innovators meet and collaborate. In addition, COST participants will be systematically linked to online and social networks for researchers, creating the possibilities for COST Actions to disseminate their activities and work on an even larger scale, and investments will be made in order to further enhance the database of COST Action participants. Furthermore, processes will be put in place in order to identify the outcomes of an Action and to transfer this knowledge to the wider research community. These particular aspects will serve both the modernisation of the networking systems and the lowering of the entrance barriers for the isolated pockets of excellence.

In the follow-up of a COST Action, the COST Association will accompany COST Actions in order to help them identify and explore ways to continue their networks and/or valorise the results coming from the Action, and the result of the COST Action activities will feed into In order to ensure the continuation of their networks, COST Actions will be informed about the possibility for setting-up a legal structure (e.g. association) which can also facilitate the request for additional funding.

4.2 Add maximum value to COST Actions

COST will add value to its core businesses, by offering new services that strengthen its position and that of its Actions in the ERA (Figure 16). These services will be available for participants in all COST Actions. COST will establish partnerships with other research and innovation stakeholders creating a unique network and offering a wide range of opportunities for researchers and innovators across Europe, making COST an indispensable partner in the European R&I community.

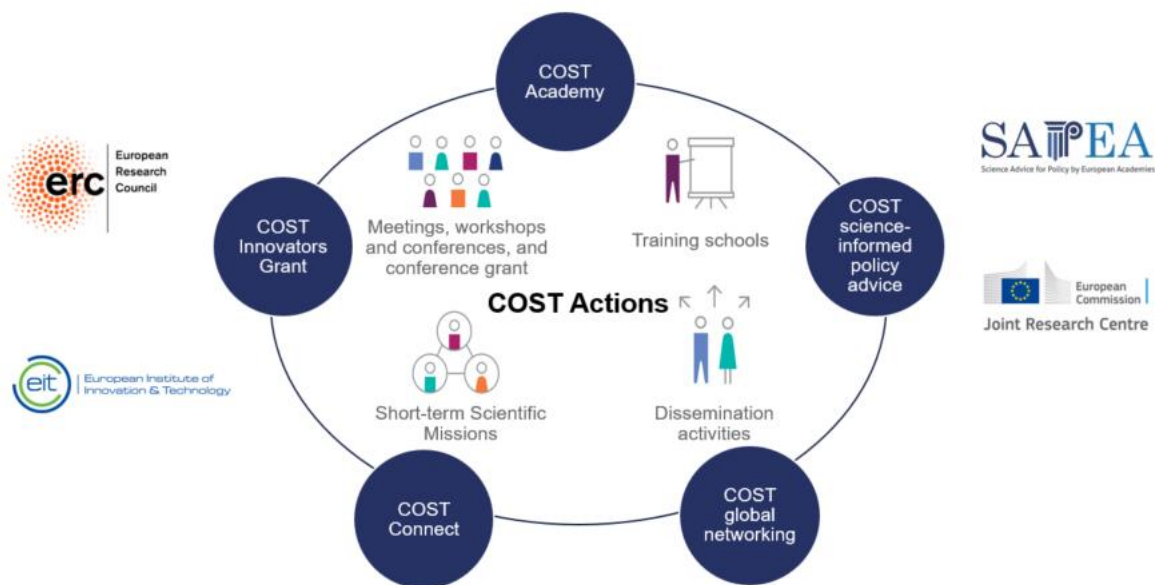


Figure 16. By providing a coherent set of networking instruments, and offering added-value services to the COST Actions, COST is an indispensable partner in connecting the different funding instruments in the ERA.

- COST Connect

Rationale: In order to increase its visibility and impact and to act as a pre-portal to ERA, COST creates synergies between research and innovation stakeholders working on a common topic high on the EU policy agenda. Through COST Connect, COST will provide funding and networking opportunities to the COST Actions' participants and link them with relevant ERA stakeholders in order to discuss possibilities for future research cooperation.

Implementation: With the COST Connect workshops, COST offers an interactive networking forum to COST Actions and ERA stakeholders (e.g., JPIs, JTIs, EIT KICs) in a specific research or innovation domain. COST Connect workshops are organised on different topics in which the COST Actions are active, and provide networking and funding opportunities, link researchers and innovators with policy makers and thus connect different stakeholders and funding instruments in the ERA. These events allow to make connections among COST Actions (meta-networks) and linking them to other initiatives related to a given topic.

Target: Each COST Action should in the course of its lifetime benefit from at least 1 COST Connect Event.

- **COST Academy**

Rationale: To address the needs of COST participants, in particular ITC-participants and young researchers and innovators, with respect to the management of a COST Action, the COST Academy was set up.

Implementation: The COST Academy – which will be organised following every Open Call - enhances the leadership, financial/administrative, and communication skills of ITC and young researchers and innovators. It offers a series of specific workshops and mentoring, as well as various modules of online training courses, and will build on the work of the Targeted Network BESTPRAC⁵. In 2017, a pilot of the COST Academy started and will be scaled-up. Added value compared to other initiatives, such as the NCP Academy, will be taken into account.

Target: By the end of FP9, at least 2000 researchers and innovators having participated in the activities of the COST Academy.

- **COST Science-Informed Policy Advice**

Rationale: The need for science-informed policy advice at both national and international levels is increasingly realised. The substantial increase of the science base, and the pace of innovation is both an opportunity and a challenge for societies and governments. COST Actions are a pool of excellence that can be utilised for science-informed policy advice on relevant EU policy topics.

Implementation: COST is in an ideal position to mobilise expertise from its COST Actions, feeding into science-informed policy advice of the Scientific Advice Mechanism (SAM) to policy makers. COST will closely cooperate with the Science Advice for Policy by European Academies (SAPEA) consortium, which makes part of the SAM, as well as the Joint Research Centre (JRC). To this end, COST will fund a series of dissemination/publication activities, and engage on an active level with policy makers and decision takers.

Target: 20% of COST Actions feeding into policy advice per year.

- **COST Global Networking**

Rationale: The scientific expertise that is required to reach the full potential within a COST Action might not always be present in Europe. By the same token, participation in COST Actions might be beneficial to NNCs. Therefore, COST has a pro-active *Open to the World* policy, enabling that researchers and innovators from all over the world can join the COST activities. The increased involvement of NNCs will furthermore empower ITC participation in COST through several regional collaboration activities in the Mediterranean, including both ITCs and NNCs.

⁵ "The Voice of Research Administrators – Building a Network of Administrative Excellence".

Implementation: Top-up budget for NNC participants for COST Actions will be reinforced. Dedicated Info Days will be organised in NNCs, in particular in less research intensive countries associated to Horizon 2020 but not members of COST. With a view to even further broaden the scope of COST beyond Europe, a selected number of IPCs which have a track record of collaboration in COST Actions will be approached, in order to discuss with them the possibility to engage further with COST through a new partner status.

Target: By the end of FP9, participation of researchers and innovators coming from NNCs will be doubled. To this end, at least one Info Day per year will be organised in the selected NNCs and IPCs. At least 5 COST Partner Members will be part of the COST framework by the end of FP9.

- **COST Innovators Grant**

Rationale: In order to enhance the pace and the success of breakthrough innovations and to create bridges between the scientific research that is performed in COST Actions and marketable applications, a COST Innovators Grant for exploring innovation potential will be developed.

Implementation: For COST Actions that demonstrate a commercial/innovation potential, an additional budget will be allocated to enhance the potential take up. For budgetary reasons, this activity will be launched under FP9. The funding will cover activities of turning the research network outputs into a commercial or technical proposition. In order to fully benefit from this Innovators Grant and to successfully implement it, COST Actions will be able to apply for a 1-year extension of their activities. COST will maintain an interface with relevant initiatives, such as the EIT, as well as the newly created European Innovation Council (EIC) initiative that is subject to further development.

Target: At least 20% of the completed Actions to be eligible for funding for the COST Innovators Grant, under FP9.

- **Cross Cutting Activities**

Rationale: As a mean to build the European Research Area and to promote the values of science in Europe, several policy priorities have been established across Europe and shared by countries. COST is also doing its part with its inclusiveness policy (geographical spread, young researchers and gender balance). However, there is still a need to better connect policy-makers and R&I actors to share best practices. The networking experience of COST will be particularly useful to address this need. This can be complementary to the Policy Support Facility tools funded by the EC.

Implementation: COST Cross Cutting Activities (CCA) will be installed with the objective to utilise the COST Networking instruments for targeting specific policy priorities in order to strengthen the role of COST in a given policy domain related to COST policies, ERA priorities or other EU R&I policies. They will focus on horizontal topics such as impact, science communication, gender equality in R&I, and research integrity. The topics will be decided top-down, and the primary beneficiaries of the outcome will be the COST Action participants and the community of R&I policy in Europe as a whole. The CCA will be built on the successes of previous Targeted Networks but also take into account the caveats, for instance in terms of duration and funded activities, as CCA cannot be considered as “traditional” COST Action.

Target: One Cross Cutting Activity to be funded each year, running for maximum 2 years.

4.3 COST’s instrumental role in contributing to the EU Spreading Excellence and Widening Participation (SEWP) activities

Due to its proven track-record of networking researchers across Europe and its success in reaching out to researchers and innovators in the less-research and innovation intensive countries, COST can play

a role in supporting the Spreading Excellence and Widening Participation (SEWP) programme in Horizon 2020 and its successor under FP9.

For example, the 'ERA Chairs' projects bring outstanding academics, with proven research excellence and management skills, to universities and research institutions in the 'Widening' countries with potential for research excellence. The aim, is to attract and maintain high quality human resources under the direction of an outstanding researcher (the 'ERA Chair holder'). Building on its experience and capacity in networking excellent researchers across Europe, COST can play an important role in identifying and proposing to the EC future ERA Chair holders and participants out of its own networks and databases.

Another example is the current *Twinning* instrument in the SEWP is a networking instrument between one institution from a 'Widening' country (the coordinator) and at least two leading institutions from two different countries as partners. The activities that are funded are somewhat similar to activities funded in COST Actions. COST can act as broker in identifying and proposing to the EC future Twinning partners out of its own networks and databases.

Finally, the current *Teaming* instrument in the SEWP is a collaborative instrument between one institution in a 'Widening' country (the coordinator) and a partner institution with an international reputation in research and innovation excellence. It supports the establishment of new, or updates of existing, Centres for Excellence in 'Widening' countries. COST can act as a broker in Phase 1 of *Teaming* calls, which launches the partnerships, in identifying and proposing to the EC Teaming partners out of its own networks and databases.

COST's dedicated policies to ITCs will also enhance the capacity of researchers and innovators in ITCs, in submitting more Teaming and Twinning proposals.

5. Financial Framework and Requirements

In line with the Lamy Report "Lab-Fab-App" and the European Parliament's recommendations for the next FP for R&I [14], COST will at least need EUR 600 million in FP9 to cover its activities to successfully implement its three strategic priorities. With an increased budget, COST will be able to offer enhanced networking opportunities to even more researchers and innovators across Europe, and make a tangible contribution to closing the research and innovation divide and participation gaps in Europe.

Currently, 75% of the proposals that are rated as excellent do not receive funding due to a lack of budget, leaving the current overall success rate at around 5%. Increasing the budget to at least EUR 600 million (EUR 85,7 million per year) will enable an overall 15% success-rate and give COST room to further strengthen its core business, by expanding the number and reach of COST Actions and to offer more added value to its participants as described above.

The COST budget for FP9 has been prepared taking into consideration an enhanced success rate of 15%, based on the notion that the average number of proposals is in the order of 500 proposals per call. Personnel costs has been adapted according to the number of running Actions. The budget also takes into consideration the continuation of the COST Academy and of the stakeholder engagement.

The outcome of this scenario is as follows:

- Total required budget of at least EUR 600 million for the entire duration of FP9 (EUR 85,7 million per year).
- Up to 75 new COST Actions per call (every 6 to 8 months), reaching a maximum of 625 running Actions per year.
- Average Action budget of EUR 150 000 for 27 Participating Countries, including NNC top-up budget.

- Average budget of EUR 50 000 per COST Innovators Grant allocated to 20% of the ending Actions per year under FP9.

As mentioned in Section 2, for the future programming period (i.e. under FP9) COST is to be expected to be fully integrated into the successor programme of SEWP alongside with other instruments such as Teaming and Twinning. Consequently, 80% of its budget will be devoted to widening actions and 50% of its budget will be invested in widening countries (ITC).

The COST budget for FP9 has been prepared taking into consideration that similar conditions will apply as under Horizon 2020. COST has concluded with the European Commission a Framework Partnership Agreement for the entire H2020 period, complemented by annual Specific Grant Agreements (SGA). The SGA provides that 15% of the budget is retained and will be released subject to approval of the periodic report submitted after the ending of the SGA period. COST has entered into a European Investment Bank (EIB) loan to bridge this cash flow gap.

Under the current rules, the SGA can be extended with an additional year or even a number of years. This allows more flexibility and cost efficiency in the implementation of the budget. However, each year 15% of the budget will be retained, while the total accumulated sum of cash retained will only be released after the end of the entire SGA period. This annual accumulation of the budget and consequently, accumulation of the cash retention, requires COST to enter a larger loan with the EIB. A multi-annual grant agreement would facilitate the financial management of the COST Association.

In summary, COST needs a doubling of its current budget to implement its ambitious strategic priorities to the benefit of researchers and innovator across all Europe and beyond. COST should be considered a programme, rather than a project, and thus be offered a multi-annual funding perspective

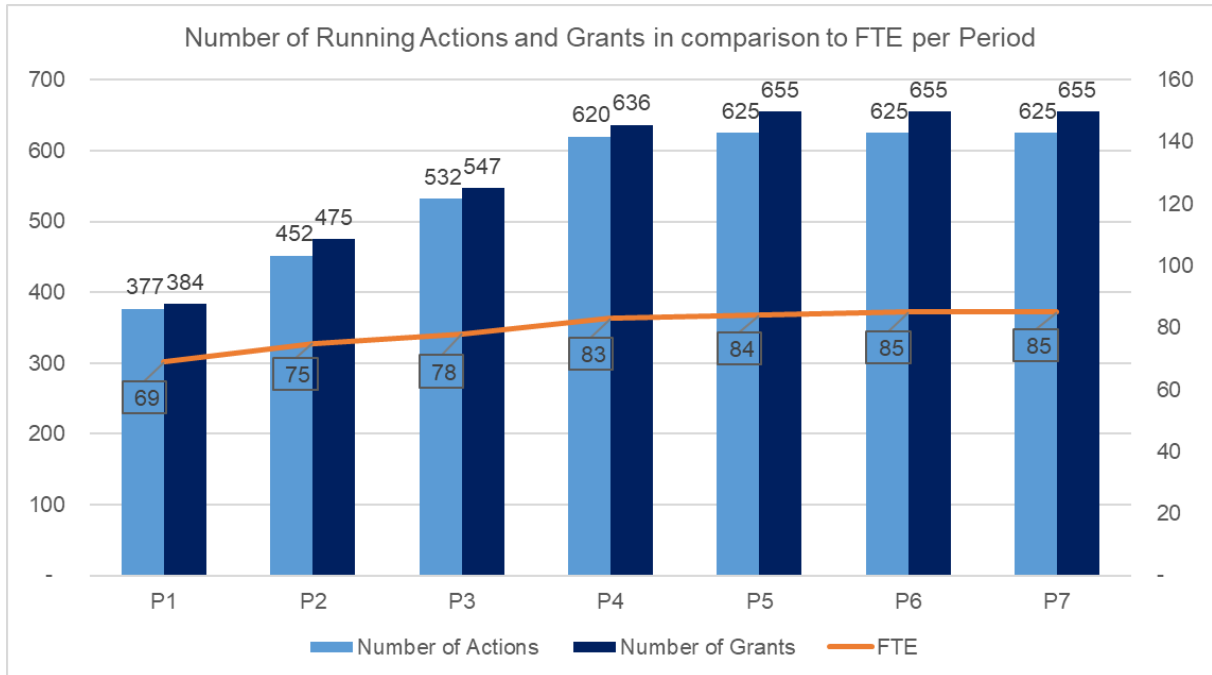


Figure 17. Number of Running Actions and Grants in comparison to FTE per Period.

The increase of the budget by 100% would imply an increase of 31% of the staff (which is necessary since the number of Administrative Officers and Science Officers is dependent on the number of running Actions and the number of Grants that are to be implemented). This estimation takes into account efficiency gains that could be implemented in the course of FP9.

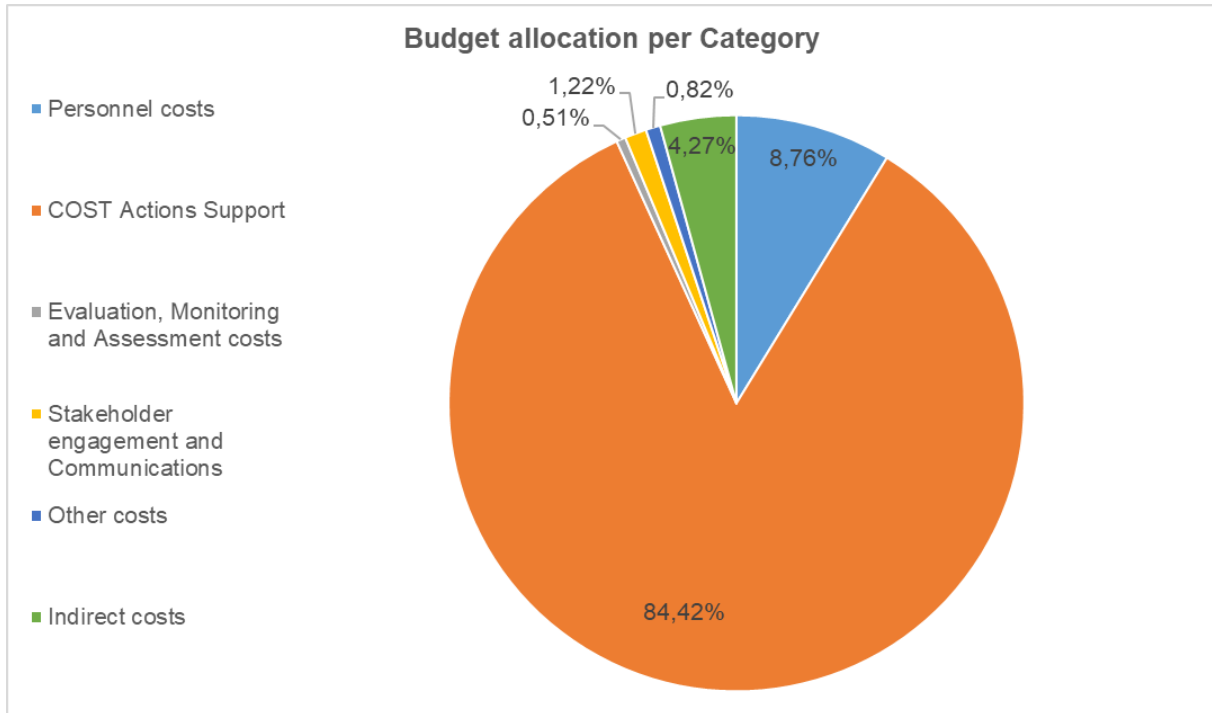


Figure 18. Budget allocation per spending category.

Next to an enhanced budget, COST also needs a funding scheme that is better suited to its organisation. The current system with annual extensions of Annual Grant Agreements leads to repeated periodic cash-flow shortages which COST must finance via an EIB loan and contributions from its members. This model is not sustainable, and a solution needs to be found for the next Framework Program for Research and Innovation.

6. Conclusions and forward look

COST is committed to reinforce its role as leading networking instrument in the ERA. In line with the COST Vision and Strategic Goals, COST has defined the following three priorities for its positioning in the remaining part of Horizon 2020 and in FP9, the next Framework Programme for Research and Innovation: 1) Promoting and spreading excellence, 2) Fostering interdisciplinary research for breakthrough science, 3) Empowering and retaining young researchers and innovators. The COST Strategic Plan defines specific targets and Key Performance Indicators for each strategic priority. Several instruments are at hand to monitor and measure the outputs, tangible results and scientific impact of COST Actions.

To implement the strategic priorities, COST will strengthen its core business by expanding the number and reach of COST Actions. New services, including COST Connect and the COST Academy are offered to strengthen the position of COST and its Actions in the ERA. COST has also the ambition, through its community involved in COST Actions, to contribute expertise to science-informed policy advice as well as to the *Open to the World* Policy.

A COST Innovators Grant scheme for exploring innovation potential will be developed to further bridge scientific research performed in COST Actions and marketable applications. Cross-cutting Activities will be deployed to utilise COST's networking instruments for targeting specific policy priorities. COST also recognises a number of opportunities for further contributing to the Spreading Excellence and Widening Participation package in Horizon 2020 and its successor in FP9. Interfaces with partners in the ERA (including for example EIT, ERC, EIC, SAM/SAPEA, JRC) will be established and maintained to create synergies and avoid duplication of efforts.

A strong need exists for an increase in budget to successfully implement COST's three Strategic Priorities. A Financial Framework and budget of at least EUR 600 million (EUR 85,7 million per year) will enable initiating up to 75 new COST Actions per call, reaching 625 Actions per year with a success rate of 15% for submitted proposals, whereas at present 75% of the proposals rated as excellent cannot be funded due to lack of budget. With this increase in budget, and in line with the Lamy Report "Lab-Fab-App", COST will be able to offer enhanced networking opportunities to even more researchers and innovators, making a tangible contribution to bridging the innovation divide and participation gaps in Europe and beyond.

The COST Strategic Plan will be implemented through Annual Activity Plans, including work packages with specific goals and key performance indicators, activities, deliverables, required human and financial resources, as well as stakeholders and beneficiaries concerned. With more budget available under FP9, COST will scale up its activities to reach its full potential as leading networking instrument in the ERA.

7. Key References

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12. COST Communication Strategy (COST 027/15), 13 May 2015.
13. COST Brand Strategy (COST 085/16).
14. Report on the assessment of Horizon 2020 implementation in view of its interim evaluation and the Framework Programme 9, European Parliament, 7 June 2017.

Annexes



Figure A1 COST key figures of 2016. Calculation based on 352 running COST Actions. The total budget of Horizon 2020 dedicated to COST is EUR 300 million, and each COST Action has an average annual budget of EUR 129 000.

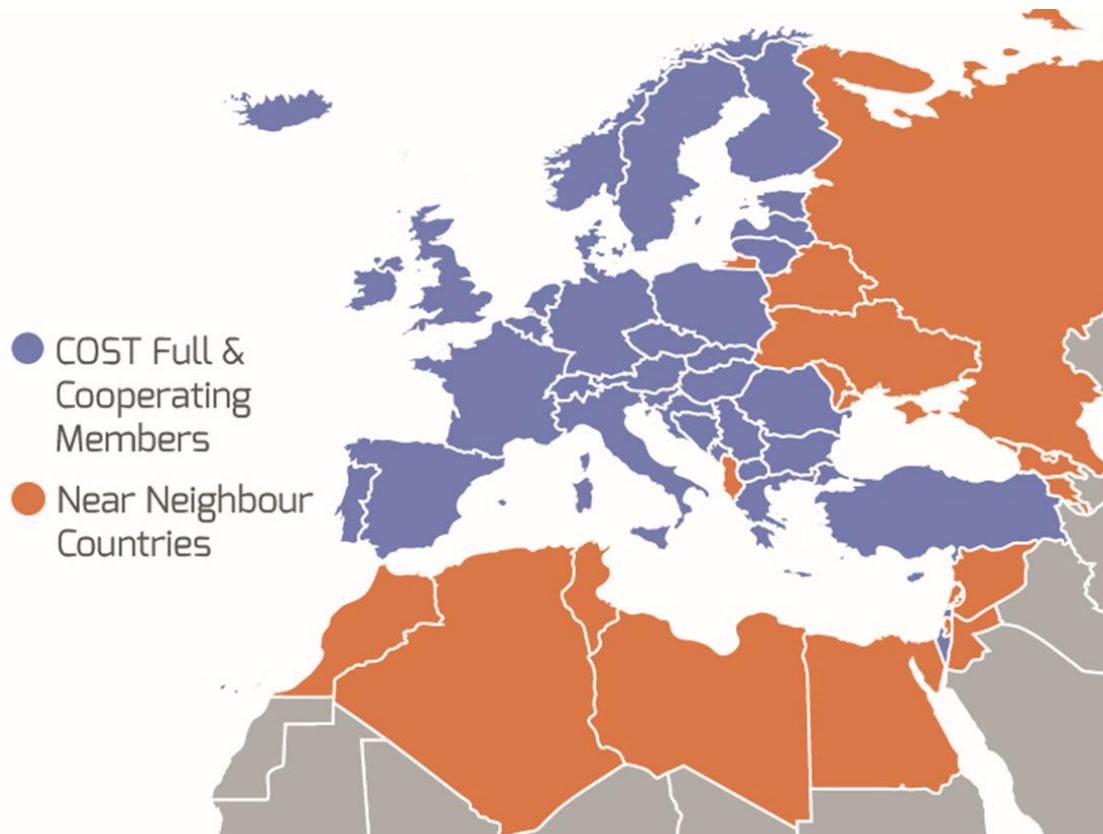


Figure A2. Participation of NNCs in COST Actions (Albania 33, Algeria 5, Armenia 17, Azerbaijan 1, Belarus 8, Egypt 10, Georgia 6, Jordan 6, Lebanon 2, Morocco 5, Palestinian Authority 6, Moldova 12, Russia 62, Tunisia 16, Ukraine 54). 243 institutions from NNCs participated in running COST Actions in 2016.

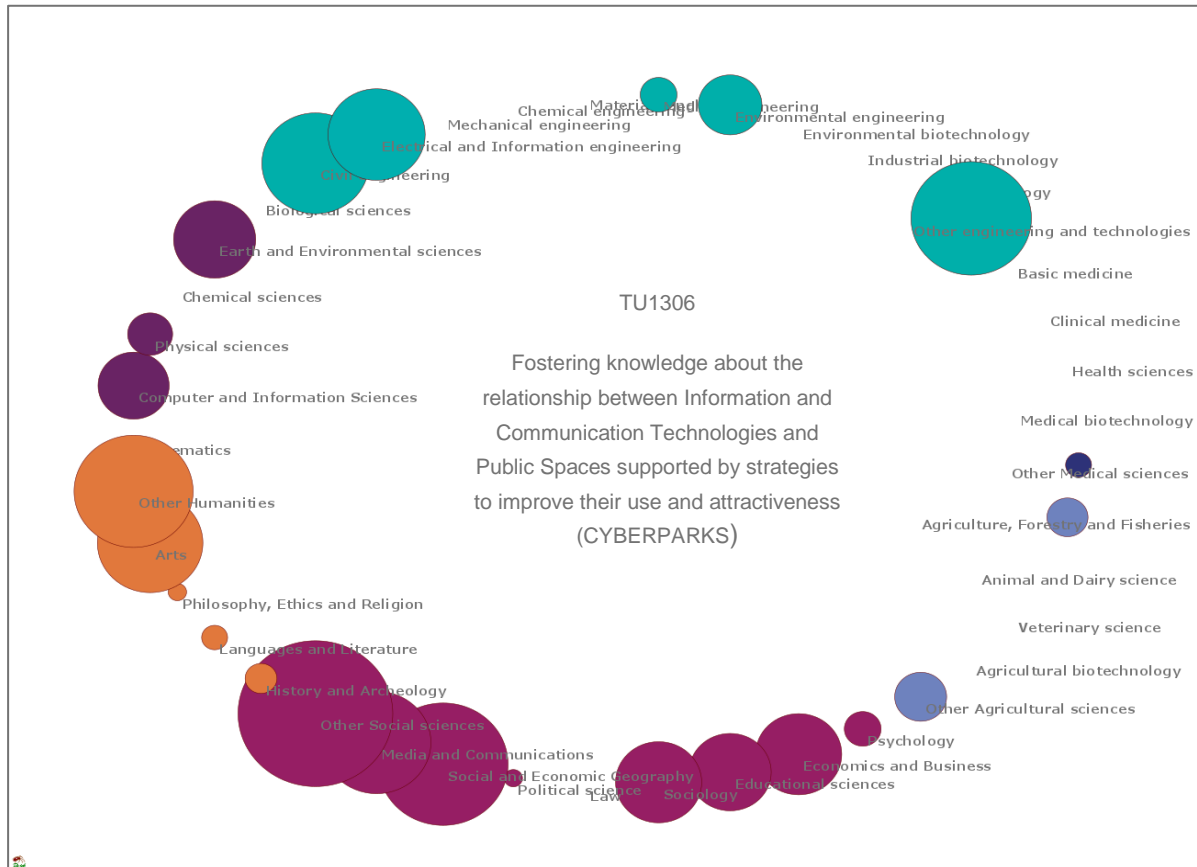


Figure A3. Interdisciplinarity within a particular COST Action.

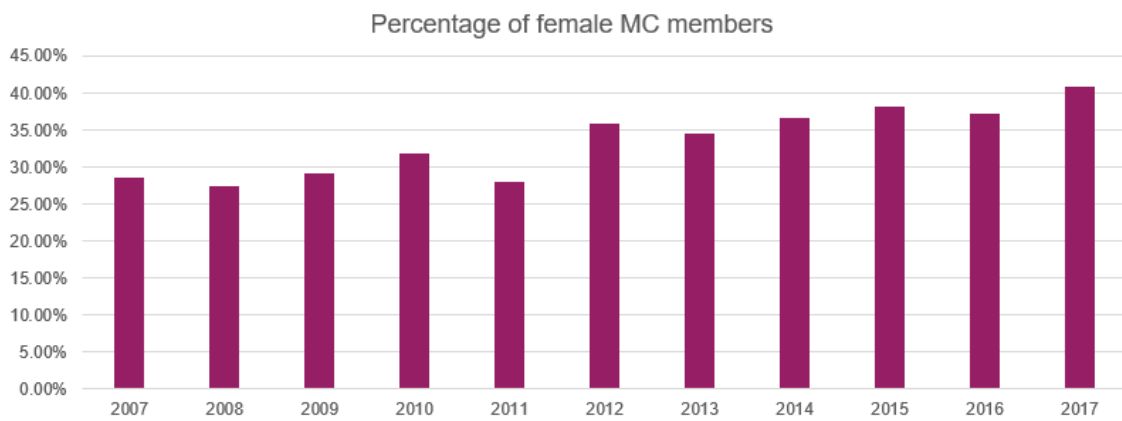


Figure A4. Percentage of female Management Committee members.