
The Benefit and Impact of COST for Germany

Summary

The **European Cooperation in Science and Technology (COST)** is an intergovernmental initiative for European cooperation in scientific and technological research under which national research activities are networked and coordinated internationally. Since its launch in 1971, COST has been helping to close the gap between science, government and society across Europe and has supported transnational cooperation between research engineers and scientists on specific topics chosen by them right across the continent. The overall good of COST is networking of scientific and technological research activities in Europe. It is open to scientists from all kinds of research disciplines, organizations and countries. COST deliberately pursues a **bottom-up approach** to encourage scientific exchange, to improve the level of knowledge in Europe on all kinds of topics, to strengthen the coordination of research activities, to support the development of innovative new ideas, to disseminate the results of the research, and to smooth the way for further joint international research projects. Furthermore, COST places great value on the ensuring that the networks include both junior and senior researchers from less research and innovation-intensive European countries (which it calls “Inclusiveness Target Countries” or ITCs).

The analysis of the **benefit and impact of COST for Germany** was undertaken by Prognos AG for the German Federal Ministry of Education and Research (BMBF) between December 2017 and August 2018.

The aim of the COST analysis was to survey participation in COST in Germany and to analyse it both – quantitatively and qualitatively – and to evaluate its benefits for Germany and identify its impacts on the programme’s target group, researchers. This provided the basis upon which to draw up recommendations for increasing the added value and the benefit of COST for Germany and the European Research Area as well as to generate ideas for the further development of COST in the context of the new orientation of the next European Framework Programme for Research and Innovation, “Horizon Europe”.

The analysis was able to rely on a very **extensive set of empirical data** which comprised two large online surveys of around 780 participants, almost 30 interviews with experts on COST (e.g. members of review panels and the Scientific Committee¹, research policy representatives from Germany, the EU Commission etc.) as well as the evaluation of monitoring data and 125 COST final reports. In addition, the analysis draws on the detailed insights from five case studies involving a total of five interviewees.

¹ Review Panels and the Scientific Committee are responsible for quality assurance and the selection of COST proposals under the evaluation procedure.

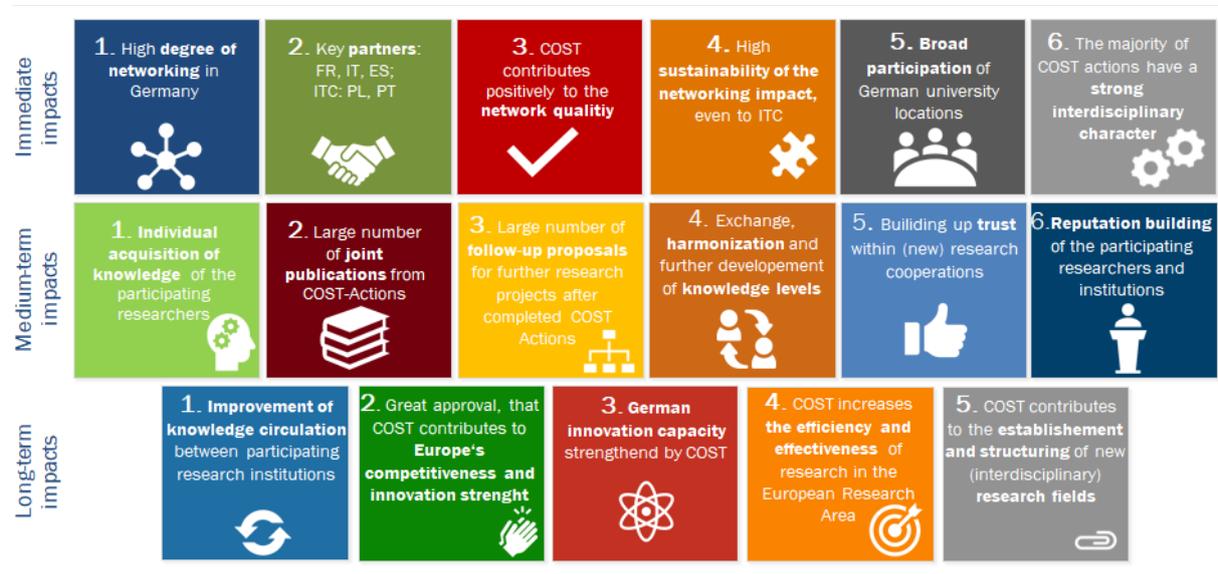
Main findings on the benefit and impact of COST

Overall, the extensive analyses reveal the **great benefit and major impact** of COST with regard to research in Germany and the entire European research community. The analyses show that, across all the intended forms of impact, **COST's support for networking** leads to important direct and indirect effects at the level of individual researchers and their institutions as well as at the level of research and innovation systems. In addition to the immediate effects, these include the improved quality of the networking of the participating partners (including the building of trust), the promotion of interdisciplinary partnerships, and the stimulation of international publications and follow-up projects. In the longer term, this also results in significant contributions by COST to improving the circulation of knowledge in the European Research Area (ERA), productivity improvements in the research landscape, and contributions to scientific agenda setting (establishment/structuring of new, interdisciplinary research fields). Germany is a central anchor in the European Research Area with strong partnerships both within the major COST Members (including France, Italy and Spain) and the so-called Inclusiveness Target Countries (in particular Poland and Portugal).

Overall, COST generates important contributions towards the **consolidation of the European Research Area** as well as for enabling initial steps towards narrowing the innovation divide within the ERA. This benefits research in Germany and the whole ERA.

The following diagram provides an overview of the **principal findings of the Analysis of the Benefit and Impact of COST** before more detailed descriptions of these findings below.

Figure 1: Overview of the principal findings of the Analysis of the Benefit and Impact of COST



Source: Prognos AG (2018).

☒ Immediate impacts of COST

The Analysis of the Benefit and Impact of COST for Germany clearly shows the **high degree of networking of German researchers** and other **immediate, positive impacts of COST**:

- German researchers are involved in **all current COST Actions**, which makes Germany a very highly networked COST Member within the COST network. Germany's strong position in the COST network is facilitated for example by the fact that access to COST Actions is open to researchers as a matter of principle. The networking activities offered by COST within their own research topic are the main motivation of German scientists to participate in the programme. Also from the point of view of the interviewed research policy actors, COST has high or very high significance (>60% positive responses) with regard to network building in Germany and the European Research Area.
- While the most frequent network relations – in terms of the number of joint participations in COST Actions – are with **established research partner countries such as France, Italy and Spain**, the **ITCs Poland and Portugal** are also important partners for Germany. Overall, there is a weaker participation by ITCs in COST Actions in quantitative terms. However, considering the findings at the level of countries tends to underestimate the networking effects on ITCs until the international mobility of individual researchers is taken into account. It must be assumed that many scientists from ITCs work at research institutions in the EU15 countries and are or have been involved in COST through those institutions.
- Positive contributions by COST to the **quality of networking** were confirmed by the online survey of COST participants. A great majority of the researchers reported the establishment of new partnerships and the intensification of existing international partnerships. Over 90% of those surveyed were able to intensify existing research contacts with partners in the COST member countries, and over half the existing links to ITCs were strengthened.
- The **positive assessment of the sustainable impact of networking** is highly significant: The surveys and interviews clearly revealed that contacts made through COST are long-lasting. A third of those surveyed stated that they maintained all new or intensified contacts in Germany in the long term, and around 20% were able to maintain all contacts with partners in ITCs in the long term.
- Within the German academic landscape there is a **broad participation of locations with higher education institutions** and thus also **wide acceptance** of the programme: Nearly all higher education locations in Germany are involved in COST activities in some form. The **TOP 5 locations** in terms of the number of their members on the Management Committees (MC) of current COST Actions are Berlin, Munich, Hamburg, Hanover and Dresden.
- The **majority of COST Actions have a strongly interdisciplinary character**: More than 60% of those surveyed stated that interdisciplinarity is of high or very high importance for research results.

☒ Medium-term impacts of COST

In addition to networking, the **medium-term impacts** envisaged by the COST programme include the generation of new scientific insights in various forms with an initial impact at the level of individual researchers and research alliances. The following impacts of COST can be summarized on the basis of the analyses:

- A further important form of impact of COST is the alignment, harmonization and further development of knowledge levels and the **coordination and standardization of processes and approaches**.
- The COST Actions result in a **large number of joint publications**. This is shown by analysis of the 125 COST final reports and the online survey of COST participants. Three quarters of the COST final reports listed more than 10 publications; a third listed more than 100 publications. Around 70% of the surveyed COST participants also stated that COST networking successfully enabled publications together with European partners.
- COST Actions also stimulate a **high number of follow-up proposals** for further research projects: The analysis of COST final reports (n=125) shows that an average of nine follow-up applications were submitted per COST Action, of which at least two thirds were approved (of which 45% were applications submitted under EU programmes, particularly the Research Framework Programme).²
- Furthermore, the following impacts can be seen at the level of **individual COST participants**:
 - The **individual acquisition or increase of knowledge**, above all in research fields familiar to the participating scientists, is confirmed by almost 75% of those surveyed as the key effect of their COST Action.
 - COST Actions also play an important role for **building up trust between the scientists involved**: Nearly 90% of surveyed COST participants confirmed the major role played by COST in the building of trust and talked of increased trust among the participating scientists in a COST Action.
 - In addition, COST contributes to the **reputation building** of the participating researchers and institutions: Just over 70% of the surveyed COST participants agreed that COST was responsible for an increase in their individual reputation and profile within the ERA. There was an even slightly stronger effect in this regard for institutions. Almost 80% of these confirmed that there was a corresponding increase in their reputation and profile due to their participation in COST.

☒ Long-term impacts of COST

The **long-term aim** of COST is to enable scientific breakthroughs in Europe through the networking of interdisciplinary collaborations and research projects. Overall, it is clear that the programme has a positive impact on the mobility of researchers and on bridging of the European innovation gap. The analyses of the benefit and impacts of COST have concluded the following results:

- According to the empirical analyses, a central long-term effect of COST is **the improvement in the circulation of knowledge** between the participating research institutions. This contributes to improving Europe's scientific capability. Almost 70% of those surveyed agreed with the statement that participation in a COST Action had resulted in an improvement in the exchange of knowledge between German and European researchers with a majority stating that it had resulted in a considerable improvement.
- They even more agreed about the **overall impact of COST on Europe's competitiveness and innovative strength**. More than 80% of those surveyed stated that COST makes a clear

² Source: Prognos (2018) based upon COST final Achievement Reports and Final Reports, provided by the COST Administration.

contribution to improving the competitiveness of European and German research.

Approximately 75% of the surveyed participants also confirmed COST's major contribution to **Germany's innovative capacity**.

- This assessment is closely related to the fact that the **efficiency and effectiveness of research in Europe are increased** through the harmonization and cooperation enabled by COST, for example through the preparatory contribution of COST Actions.
- In addition, COST contributes to the **establishment and structuring of new (interdisciplinary) research fields**, although only approx. 40% of the surveyed researchers rated this effect as (very) high (but only a fraction of respondents considered this effect to be "unconfirmed").

A crucial factor for the final assessment of the impact and benefit of COST for Germany is the '**additionality**'³ of the funding, which can be considered as an asset based on the analyses conducted: Almost 50% of the surveyed COST participants responded that it would not have been possible to achieve comparable networking without COST. A little under 40% believed that their research collaborations would have happened later or on a smaller scale, or both, without participation in COST. From the opposite perspective, it is only possible to talk of a deadweight effect⁴ in a very small proportion of COST participants (approx. 10%).

Overall, it can be concluded that COST is an effective and efficient instrument which creates a considerable impact, especially given its limited funding budget.

Recommendations for action for the further development of COST

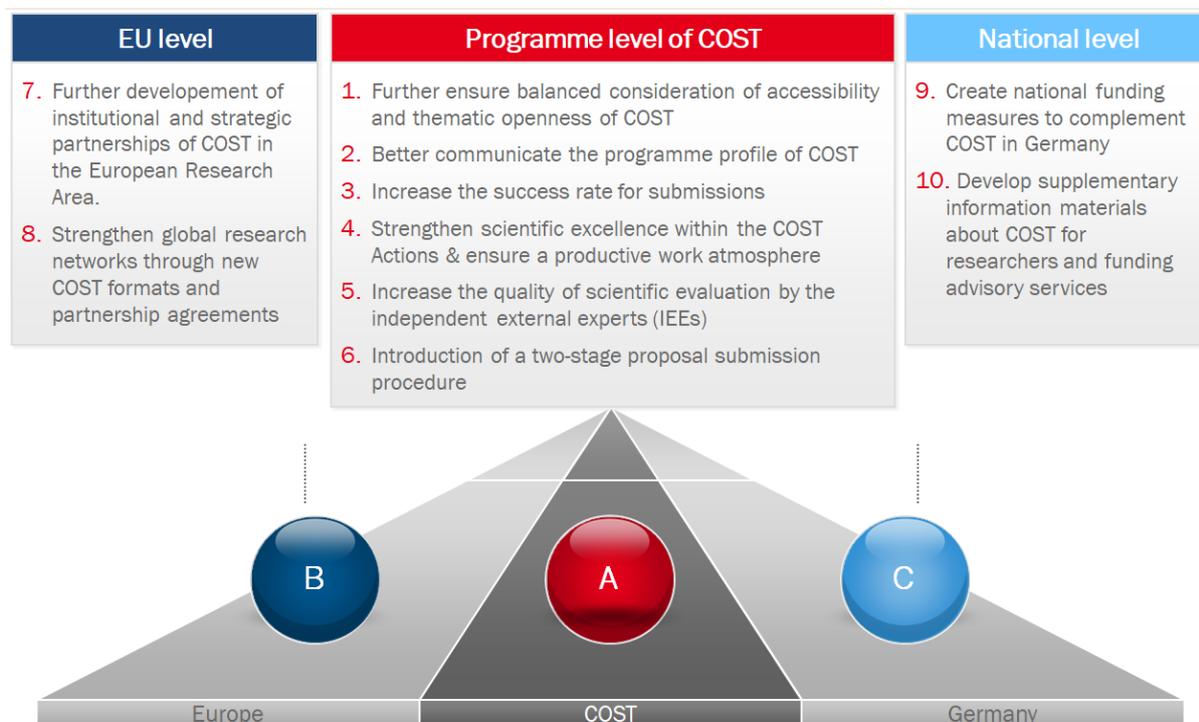
A range of areas can be identified from the empirical findings as a whole where it would be both possible and sensible to make adjustments to the programme in order to **optimize and develop it further**. In particular, the issues and problems raised in the interviews are easy to identify. However, the possible options for action are considerably more complex. Many aspects concern the overall programme and are therefore the subject of intergovernmental negotiations, while others can be controlled unilaterally at national level. On a second level, the programme's strategic orientation can be separated in analytical terms from its operational implementation. Overall, recommendations for action to develop COST further have been differentiated into **three main levels of action**: the level of the programme as a whole; the European level; and the national level. At an overall level the analysis has shown that **COST has proved itself very well as a networking instrument both for Germany and the ERA as a whole**. For the further development of COST, it is recommended above all to maintain the strategic core features (such as the creation of synergies with other existing EU funding programmes) and to optimize selected funding procedures and structures (for example, increasing the success rate for submissions, the quality of the external evaluations and/or the introduction of two-stage application processes). However, we advise against overloading the programme with new strategic objectives, for example in the area of inclusiveness, and a weakening of the core mandate through new instruments such as the COST Innovators Grant. Based on the evaluator's perspective in the analysis they consider that this will endanger the overall effectiveness of COST rather than increase it.

³ Additionality is used here to mean those research results/impacts that would not have been achieved without the COST programme and have thus been additionally induced by COST.

⁴ A deadweight effect refers to research results/impacts (e.g. international research collaborations) that would have come about wholly or partly even without the additional, financial incentive and participation in the programme.

The following graphic provides an **overview of the strategic and operational recommendations for action**. This is followed by a brief description of each of the recommendations (detailed recommendations are set out in Chapter 8 of the full study).

Figure 1: Recommendations for the further development of COST



Source: Prognos AG (2018).

The recommendations at the **programme level** of COST are summarized as follows:

- 1. Further ensure balanced consideration of accessibility and thematic openness of COST:** COST is valued by the research community in Germany due to its ease of accessibility and thematic openness. There are two recommendations for the continuation of the programme with regard to this aspect: (a) Ensure that core features (strengths) of COST are maintained, and (b) Maintain the existing scientific evaluation criteria for applications. Introducing further rules to increase the quota of participating Inclusiveness Target Countries (ITCs), for example in order to follow the inclusiveness aims of Horizon 2020, is not recommended. Alternative and existing instruments and programmes, such as Teaming and Twinning are more suited here.
- 2. Better communicate the programme profile of COST:** COST is often perceived as an “entry programme” for European funding. It is true that participants in COST Actions are generally very successful when submitting proposals for subsequent projects, including in EU programmes. However, based on the expert’s point of view, COST’s character is not really designed to lead young scientists to the “big” programmes or to provide the thematic groundwork for them. Rather, it is the case that COST pursues a fundamentally different approach to other programmes in that it focuses on providing funding for networking. This specific character of COST should be constantly in focus.

3. **Increase the success rate for submissions under COST:** The analyses provide empirical indications that the low probability of obtaining funding has a relevant impact on the range and variety of applications submitted. Above all, researchers with alternative possibilities for obtaining funding (including German researchers) are increasingly less likely to devote resources to applying for COST Actions as Main Proposers. Funding decisions can become arbitrary in extreme cases due to fluctuations in the quality of the evaluation process. Against this background, the following options for action arise: (a) increase the success rate for proposal submissions (e.g. by increasing the programme's budget or reducing the number of applications submitted) or (b) increase the comparability of the evaluations (IEEs) independent of specific evaluation cultures in different research disciplines.
4. **Increase the quality of scientific evaluation by the independent external experts (IEEs) or ensure the congruence of excellence and evaluation of the application:** In the procedure of the application evaluation process, the success of the applications depends heavily on the scientific evaluation by the IEEs. There are only limited possibilities to influence the assessment made by the IEEs in the subsequent steps of the evaluation process. However, according to the applicants and those interviewed for this analysis there is a variation in the quality of the expert evaluations. The following measures should be taken into consideration to increase the quality of the evaluations: (a) improve the training of the IEEs, (b) strengthen the role of the Review Panels (RPs) in the qualitative scientific review of the expert evaluations, (c) strengthen the feedback loop between the Review Panels and the COST Administration with regard to the quality of the evaluators. In addition, the low success rate of submissions means that even small differences in evaluations may have a significant impact on a funding decision. Precautionary measures should be introduced to make funding decisions less sensitive both to individual expert evaluations and to different evaluation cultures in different research disciplines (cf. recommendation no. 3).
5. **Introduction of a two-stage proposal submission procedure:** In light of the low success rate of submissions and a certain level of competition with instruments of other programmes, at least at national level⁵, it is suggested that the application process becomes two-staged. Under such a system, only draft proposals would be required at the first stage. Then, only those who have submitted promising proposals should be invited to submit detailed proposals so that applications which have no chance of success can be eliminated earlier in the application process.
6. **Strengthen scientific excellence within the COST Actions and ensure a productive work atmosphere:** With regard to the participation structure in COST, there is some criticism of differing levels of activity among participants. It appears that there is in some cases a problem of 'free-riding' among participants. A key factor in this context is that the Management Committee (MC) members⁶ are often overwhelmingly determined by the member states. According to those interviewed for the analysis, political criteria also play something of a role in addition to scientific criteria. The following measures should be taken to strengthen the scientific excellence of the Actions as well as to ensure a productive work atmosphere: (a) Firstly, the procedure for appointing the MC members in COST Actions should be made more transparent, (b) secondly, the Chairs/Main Proposers should be given greater powers in order to help prevent unsuitable MC members and ensure active cooperation by all participants. (c) Thirdly, the goal of using 80% of the COST budget for "widening actions" in the next Framework Programme for Research and Innovation appears

⁵ Examples of these are the DFG programmes "Wissenschaftliche Netzwerke", "Aufbau internationaler Kooperationen" and "Internationale wissenschaftliche Veranstaltungen", as well as the DAAD programme "Programm des Projektbezogenen Personenaustauschs".

⁶ Every COST Action has a Management Committee; it takes important decisions and steers the activity plans etc. of its COST Action. Each participant member country of an Action is represented in the MC.

very high based on our analysis and would substantially restrict open participation as a core element of the programme.

Against the background of the current reform discussions for the next EU budget and the next Research Framework Programme, Horizon Europe, and the findings from this Analysis of the Impact and Benefit of COST, the following **recommendations for the further development of COST in the European Research Area** should be acted upon:

7. **Further develop the institutional, strategic partnerships of COST in the European Research Area:** A stronger link between COST and other European funding programmes (Research Framework Programme, JPI, EIT) in order to create and enhance synergies in the European Research Area, as set out in the COST Strategic Plan⁷, is both sensible and desirable. In this way, the visibility and effectiveness of COST can be increased and its position as the gateway to the European Research Area can be reinforced. The COST Connect Workshops introduced in 2017 also appear to be a useful instrument for creating interactive network forums for COST Actions and ERA stakeholders (e.g. involving JPIs, JTIs, EIT) and should therefore be expanded and developed. At the same time, communication of the programme profile of COST should be improved as formulated under recommendation no. 2.
8. **Strengthen global research networks through new COST formats and partnership agreements:** Strong networking and the resulting development of research collaborations with partners in and outside the EU is one of the key strengths of COST from which Germany also benefits as a research location. At the same time, globalization, the numerous socio-political challenges of our time and new research topics all require new partners including from outside Europe. The plans by the COST Association for “**COST Global Networking**”⁸ are therefore very welcome. Overall, however, the principles of the bottom-up approach, of ease of accessibility and thematic openness should not be too greatly constrained either in this context or in other COST plans (see above).

Against the background of the empirical findings, the plans included in the COST Strategic Plan of 2017 for the “**COST Innovators Grant**”⁹ involve the risk of weakening the profile of COST as a networking instrument for primarily basic and application-oriented research topics. The analysis of COST has clearly shown that a majority (> 60%) of the surveyed COST participants do not take an interest in the preparation of patents, norms or standards within COST Actions. In addition, companies represent only a very small proportion of the participants (only 6% of COST MC members come from companies) within COST Actions. If the instrument is implemented all the same, it should be ensured that there is a close integration with the corresponding near-market funding instruments (e.g. SME, EUREKA, Eurostars).

The possibilities for influencing matters at a national level are naturally somewhat more limited in the case of an intergovernmental programme. The possible **options for action at a national level** can be divided into the possibility of supplementary national funding on the one side and advisory and marketing measures on the other.

9. **Create national funding measures to complement COST in Germany:** Supplementary national funding measures are already used successfully in some COST member countries, for example in Switzerland. Various approaches are available for such national funding measures that could be implemented on their own or in combination (depending in part on the

⁷ COST Association (2017). COST Strategic Plan, Brussels.

⁸ COST Global Networking is a funding instrument of the COST Strategic Plan.

⁹ The idea is to encourage greater participation by the COST Near Neighbour Countries (NNC) and International Partner Countries (IPCs) in COST Actions.

political preferences for the funding aims): (a) Strengthening of sustainable networking, (b) more extensive support for the Main Proposers, (c) targeted support for under-represented groups, (d) targeted administrative and/or financial support of cooperation with further countries.

Develop supplementary information materials about COST for researchers and funding advisory services: Among those interviewed, it was considered that there is an awareness of COST in Germany, but there is still potential in providing targeted information about the programme. According to the RP members, one indication for this is the high number of funding applications that are insufficiently addressing the core aspect of promoting networks. This calls for additional activities. Three specific recommendations arise: (a) Create easily accessible information offers on the above-mentioned aspects for researchers (specially for junior scientists and other under-represented groups or disciplines); (b) develop and offer more detailed information for those providing advice on funding at higher education and research institutions; and (c) initiate a regular exchange of experience between German COST participants and review panel members. Germany already participates to a very great extent in COST and benefits from the networking activities. Against this background and based on our analysis, a **strategic and operational development of COST**, which also draws upon the numerous suggestions from the COST Strategic Plan of 2017 is welcome. In this context it will be crucially important to sharpen the profile of COST as part of Europe's increasingly diverse efforts to ensure funding for research and development (R&D). If this succeeds, the positive contribution of this programme, which has established itself over more than four decades, can be maintained into the future.

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Core findings of the impact study at a glance

The Analysis of the Benefit and Impacts of COST clearly shows that COST can generate visible effects right along the funding chain in spite of its comparatively **low level of financial stimulus**. These include both immediate effects of funding (outputs) such as **more intensive networking** within the European research landscape, the **exchange and growth of knowledge** and the production of international **publications** and the facilitation of **follow-up projects**.

In this way, COST succeeds in contributing on a substantial scale also to the generation and consolidation of new and often **interdisciplinary research fields** and increasing **overall effectiveness and efficiency** of the research landscape in Europe. These contributions enable important impulses for **strengthening the competitiveness and innovativeness** of the German and European research landscape.

The assessment of the **"additionality"** of the funding is of particular importance in this context: **Around half of the surveyed COST participants would not have been able to develop a comparable network without COST**. Among other COST participants the research collaboration or follow-up projects would have started later or on a smaller scale or both. Also, all subsequent impacts would very likely not have been achievable without this funding impulse.

This shows very clearly the overall **important role of COST** as an instrument of networking and initiating research collaborations throughout Europe, both in the established research locations and – with somewhat less significance from the German perspective – with partners from the “Inclusiveness Target Countries” (ITCs) as defined by COST. These are followed a little way behind by the “COST International Partner Countries” (IPCs) and other neighbouring countries with institutions recognized by COST (“COST Near Neighbour Countries” – NNCs)¹⁰.

¹⁰ A list of the countries and their assignment to these categories can be found in chapter 2.1 of the Analysis.