EUROPEAN UNION

EUROPEAN RESEARCH AREA
AND INNOVATION COMMITTEE

– ERAC –
Secretariat

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NOTE

From:	ERAC Secretariat
To:	ERAC Delegations
Subject:	ERAC Annual Report 2018

Delegations will find annexed to this Note the ERAC Annual Report 2018 as adopted by written procedure.

ANNEX

THE EUROPEAN RESEARCH AREA AND INNOVATION COMMITTEE (ERAC)

2018 ANNUAL REPORT

CONTENTS

1. Editorial by the ERAC co-Chairs

In 2018 various important ERAC activities took place; they had an impact on the Council, the Commission, the Member States, the Associated Countries and stakeholder organisations. We recommend viewing this report as offering not so much a summary of documents and procedures, but rather an outlook on European developments in the field of research and innovation policies.

As part of its role as strategic policy advisor, ERAC holds strategic debates twice per year on two topics, [this time] on how to further optimise the efficiency and effectiveness of national research and innovation systems, and on tax incentives for research and development. These debates benefit considerably from the expertise provided by the Commission services, in particular the Horizon 2020 Policy Support Facility, as well as by external experts.

In the last few years, there has increasingly been a convergence of views across the European R&I community regarding the need to rationalise the EU R&I Partnership landscape, and to have more strategic and impactful Partnerships. ERAC promptly capitalised on this momentum at the end of 2017 by establishing a dedicated Ad-hoc Working Group to develop recommendations on the way forward. The Group's work on Partnerships was duly taken into account by the Commission in the preparation of the Horizon Europe proposal.

In addition to ERAC, the other ERA-related groups also made important contributions in 2018, which are well documented in this report. This fourth Annual Report from the ERAC and the ERA-related groups highlights the progress that has been made in the last year towards a fully operational European Research Area. We are more than halfway through the implementation of the ERA Roadmap 2015-2020. The National Action Plans that most countries published in 2016 in line with the ERA Roadmap show their ambition to make further progress on ERA. In 2018, ERAC continued to follow up on the implementation and monitoring of the impact of the ERA National Action Plans, by organising two ERA workshops.

According to the 2018 ERA Progress Report, there has been real progress in achieving the ERA goals, as measured by the ERA Monitoring Mechanism. However, progress seems to be slowing, and large disparities between countries persist. Not only is there considerable room for further improvement on most priorities, but the decline in progress overall also calls for a reflection on how to accelerate, strengthen and further encourage the implementation of ERA priorities. As new challenges arise, European and national authorities increasingly need to adapt their policy response in order to seize new opportunities and remove old obstacles.

In 2018, ERAC conducted the first triennial Review of the ERA advisory structure and adopted the relevant Final Report unanimously. As a follow-up, Council conclusions on the governance of the ERA were also adopted, and ERAC decided to establish an Action Plan to translate these conclusions into concrete actions. While the 2018 Review was meant to be evolutionary in nature, proposing adaptations to the existing set of priorities and structures, it is clear that the next Review in 2021 should allow a more fundamental overhaul of the ERA architecture.

Europe will need to continue to adapt its research systems since, nowadays, knowledge is created, shared and communicated with increasing speed. Research and innovation are the essential building blocks of Europe's future competitiveness, prosperity and well-being. ERA priorities will thus also evolve over time. A review and deepening of the ERA are expected in 2020. Our common goal - of the Member States, Associated Countries and the European Commission - is to continue building, in close cooperation with all ERA stakeholders, a modern and agile ERA that helps us to jointly shape the future we want, for the benefit of all European citizens.

Jean-Eric PAQUET	Christian NACZINSKY
Director-General for Research and Innovation European Commission	Head of EU and OECD Research Policy Dep. Austria
Commission ERAC co-Chair	Member States ERAC co-Chair

2. Personal contributions

(The personal contributions solely reflect the personal experience of the authors)

a) Reflections on the panel discussion at the Europa- und Bundesgymnasium, Salzburg-Nonntal, September 2018

by Dr. David Wilson, Strategic adviser on science, innovation and enterprise

I will not hide the fact that I was nervous about moderating a panel discussion in a school as part of the ERAC and RWP meetings in Salzburg. I know how to deal with tricky questions from senior officials from all round Europe, but – with all due respect to my esteemed colleagues – smart students are a much tougher proposition. They have a tendency to ask exactly the right sort of awkward left-field question, and an unmatched ability to see straight through any attempt to flannel the answer. And given that both panel and audience were a mix of a minister, a DG, senior officials, teachers and students, would we get a genuine dialogue or just a series of set pieces?

So a risky thing for ERAC and the Austrian Presidency to do. Good. It really encouraged me to see that a body with ERAC's experience and potential is continuing to seek new ways of reaching out.

I think the session yielded genuine value for the policy agenda of Horizon Europe and Erasmus. What really struck me was that ministers, officials and students were largely identifying the same policy priorities – which is reassuring – but there were some important messages on how those priorities need to be put into effect and communicated. Across all the topics discussed, four things came out that really seemed to matter to the students:

- ***inclusiveness*** – making sure that opportunities in science and education were not restricted to the well-off or to insider groups

- ***privacy*** – making the most of the potential of technology but taking seriously the risks of surveillance and prejudice

- ***connection*** – not treating science and education as separate topics, and looking at ways to enable young people to collaborate across borders

- ***proving trustworthiness*** – a strong sense that assurances on the other three points were not enough and there had to be a clear commitment to meaningful action and communication.

I also think we got genuine dialogue in the hall. It helped that the students had amazing facility in English and impressive self-confidence, but they also brought substance and insight to their comments. Equally, the non-student members of the panel did not put themselves on pedestals or hide behind their seniority, but let themselves be open to challenge and new ideas. All of that made my task much easier, and it was a genuine pleasure to moderate the conversation.

In summary, therefore, a really worthwhile experiment that yielded genuine value and, I hope, encourages ERAC to take further bold steps to build dialogue and understanding. I also felt I was back amongst friends, which was wonderful. Please keep going from strength to strength.

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b) Review of the ERAC advisory structure 2018: Applause for ERA!

by Dr. Philipp Langer, Deputy Director-General, State Secretariat for Education, Research and Innovation, Switzerland

This year, ERAC conducted its first Review of the ERA advisory structure following the Council Conclusions of 1 December 2015 on the Review of the ERA advisory structure. When I was appointed to act as rapporteur, I had mixed feelings, seeing the opportunities of such an exercise but also the challenges.

In terms of opportunities, this review would be a good occasion to stress that, thanks to the major steps made since 2014, **the European Research Area (ERA) has been achieved**. No other continent boasts such an intense and institutionalised international R&I cooperation framework. The activities of the ERA and of its main implementing instrument, the EU Framework Programme for Research and Innovation, focus on questions that are too big to be addressed by one country alone, yet they are carefully designed to be complementary to national activities. In a constructive spirit of collaboration, the EU Member States and the European Commission have made the wise choice to build the ERA and the EU Framework Programme as the most open R&I projects in the world, closely involving the Associated Countries and opening up the Programme for participation on the part of third countries worldwide. As a result, Europe has become the biggest and most open platform for R&I and simply 'the place to be' for any international researcher. If a similar feat had been accomplished by America, we would see flags everywhere commemorating this fabulous success. Our European culture means that we simply take note of this achievement while already thinking of the next challenge to address. Even though we are not good at celebrating accomplishments, we should use the opportunity afforded by the ERA Review to stress that the ERA has been achieved and is fully operational, and that it is simply the best place in the world for R&I.

As for the challenges of doing this review, the very fact that the ERA is now a reality entails the risk that the current ERA priorities and their related advisory structures may become stagnant and unambitious. On a more personal level, I was also reluctant to act as rapporteur as I come from an Associated Country and the ERA advisory structure is part of the Council preparatory bodies of the European Union (and the Council consists, of course, of Member States only). At least, this constellation could provide a somewhat 'neutral view' at a time when the EU Member States were – and still are – fully absorbed with the negotiations of the next EU Framework Programme Horizon Europe.

With these mixed feelings, I humbly found myself appointed as rapporteur by ERAC; happily, I had the valuable support of my Swiss ERAC colleague and Deputy Dr Lisa Müller, as well as of Director-General Kari Balke Øiseth (former ERAC delegate for Norway). This small group was mandated by ERAC to conduct the review of the ERA advisory structure. Trying to adhere to the Swiss principles of neutrality and meticulousness, we wanted to stick to the facts and to conduct a documentary analysis, assessing the output and the performance of each ERA-related group against its mandate, work programme and the objectives of its ERA priority, completed by an assessment by the Chairs of each ERA-related group. We developed and deployed an online survey for all ERAC stakeholders: ERAC co-Chairs, ERAC delegations and the European Commission, Chairs of all other ERA-related groups, Council Presidencies of the examined period, the General Secretariat of the Council and members of the ERA Stakeholder Platform. Following ERAC's advice, we added a wide number of open-ended text fields, leaving room for suggestions and personalised feedback. Finally, we conducted personal interviews with key players, notably the Co-Chairs of ERAC, the responsible Director-General of the General Secretariat of the Council, several Chairs of the other ERA-related groups as well as representatives from the ERA Stakeholder Platform organisations.

Both the process and the result are quite typical for Europe in general and ERAC in particular. Firstly, to get going, you need a clear mandate, which was in our case well designed both in the Terms of Reference but also in the ERAC Opinion on the review of the ERA advisory structure some years ago. Secondly, your best guarantee of success is to have a few committed colleagues who help you get the work done. Kari Balke Øiseth, my colleague Stephanie Vögeli in Bern and especially Lisa Müller have done precisely this. Lisa and I took turns working on finalising the report throughout entire nights and weekends. I would like to extend my warmest thanks to these colleagues and everyone else who contributed to this work. Thirdly, the amount of knowledge and wisdom that is present among delegates and the European institutions is absolutely stunning: in the open-ended questions, the survey participants provided a total of 77 pages (format A4) of replies with fantastic and visionary ideas for improvement and simplification. They made the analysis very challenging but are a real treasure trove of knowledge. Fourthly, the more visionary ideas are precisely those that often have a hard time getting through consensus-seeking processes. My personal conclusion is that we must continue to treat the ERA as a living body and allow it to address future priorities dynamically in order to keep it active and thriving. To this end, I would highly recommend using the wisdom gathered from delegations as a source of inspiration for the upcoming revision of the ERA framework in the years after 2020.

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c) The success story of the ERAC Ad-hoc Working Group on Partnerships

By Maria Reinfeldt (European Commission, DG for Research and Innovation, and former chair of the Ad-hoc Working Group), *Jörg Niehoff* (European Commission, DG for Research and Innovation) and *Erik Hansalek* (Head of Division at the German Federal Ministry of Education and Research, ERAC member and former chair of the Ad-Hoc Working Group).

In the last few years there has increasingly been a convergence of views across the European R&I community on the need to rationalise the EU R&I partnership landscape as well as to have more strategic and impactful partnerships. ERAC promptly capitalised on this momentum at the end of 2017 by establishing a dedicated ad-hoc working group to develop recommendations on the way forward.

The importance of the topic is very clear from the twenty-two participating delegations, which make it one of the largest ERAC Working Groups. Considering the high expectations and the huge pressure to deliver on time, steering the Group towards a satisfying outcome was not self-evident at the beginning. And yet, it quickly became a success story in terms of working methods as well as for providing timely strategic advice on a highly complex and sensitive topic.

As with many other success stories, it cannot be attributed to a single golden rule but rather to several contributing elements:

- **Long-term and systemic preparatory work** by the Estonian Presidency to study, frame and raise the topic at political level (with the help of experts and a report by Technopolis);
- **A good and trustful working environment**, meaning that the group worked under 'Chatham house rules' and everyone's voice was heard;
- **A good common understanding of the goal and end-product from the start** – unanimously agreed since the very first meeting;
- **Co-ownership by both the Member States and the Commission** – strong collaboration and shared ownership of the task at hand. All participating countries actively contributed to the work through discussions, desk research and written input;
- **The right timing**: the Commission quickly took up the results and included them in the legal basis for the forthcoming framework programme Horizon Europe. This approach also facilitated the negotiation process at Council level.

Whilst creating a collegial working environment and a positive spirit of cooperation is a success in itself - especially when considering the complexity of the task - the modus operandi of the Group proved itself to be highly effective, both in terms of output (four reports with recommendations plus a Final Report) and impact on the next Framework Programme. As regards impact, the partial general agreement on Horizon Europe and related provisions on European Partnerships show a high level of convergence with the recommendations of the Working Group. The Commission has proposed, inter alia, a draft criteria framework (outlining how the criteria in the Regulation will be addressed along the life-cycle of European Partnerships) as well as a discussion paper on the strategic coordinating process for partnerships. Recommendations related to setting up a national process and monitoring framework for participation in partnerships are currently being addressed by countries through dedicated national activities. The follow-up process taking place in 2019 will be discussed in the next ERAC Annual Report.

European R&I policy making might often be perceived as slow and distant, but we enjoyed showing that it can move quickly and make a true difference.

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3. Summary of the 2018 ERA Progress Report

The ERA Progress Report 2018 summarises the state of the European Research Area (ERA) and the progress of its implementation over the period 2016-2018. It is the second consecutive time that progress on the ERA has been measured at the level of each country using the ERA Monitoring Mechanism, a set of 24 core indicators (including eight headline indicators) jointly defined by Member States, research stakeholders and the European Commission.

The ERA Progress Report 2016 published two years ago showed that substantial progress had been made in implementing the ERA over the last decade. At EU level, all headline indicators improved, but large disparities remained between Member States, both in performance levels and growth rates.

Based on the overall evolution of the eight headline indicators, progress on the implementation of the ERA since 2016 has been more nuanced: it continues, but at a slower pace.

In November 2018, the Council adopted conclusions on the governance of the European Research Area. It referred to its conclusions of May 2015, which formed the basis for the subsequent ERA National Action Plans and called for the monitoring of the implementation of the ERA Roadmap to be integrated into the ERA Progress Reports, based on headline indicators proposed by the European Research and Innovation Advisory Committee.

So far, mid-way through the ERA Roadmap 2015-2020, 25 Member States and four Associated Countries have adopted National Action Plans for the period 2015-2020. These plans provide official information on ERA strategies and corresponding policy measures at national level and constitute an important source for charting the progress of implementation of the ERA. The majority of National Action Plans are structured according to the six ERA priorities, which is further evidence of systematic and shared efforts to plan national reforms geared towards achieving the ERA.

Overall, this report shows that progress in implementing the ERA has recently been slowing down and that important disparities between countries remain and sometimes grow. These trends call for a renewed commitment to further strengthening shared efforts, at all levels, to reform national research and innovation systems and to achieve a properly-functioning ERA. The European Commission has anticipated this need through a number of proposed programmes for the next financing period 2021-2027, notably the regional funds, the European Reform Delivery Tool and the next EU R&I framework programme – Horizon Europe. The latter makes specific provision to strengthen the ERA.

In conclusion, the ERA Roadmap 2015-2020 continues to be an influential tool to help Member States and Associated Countries define, align and implement the necessary ERA reforms at national level.

4. Key achievements by ERAC and ERA-related Groups

a) Introduction

ERAC is a strategic policy advisory committee whose principal mission is to provide timely strategic input to the Council, the Commission and the Member States on research and innovation issues that are relevant to the development of the European Research Area (ERA).

Throughout 2018, for each of ERA's six priorities, the ERA-related groups took responsibility for specific development and implementation and reported to ERAC. This Annual Report[1] has been prepared by ERAC and summarises challenges faced by the ERA-related groups and their achievements in 2018 as well as plans for 2019 and beyond.

The key achievements of the ERA-related groups are summarised below.

Full individual reports from each of the groups are presented in the **Appendix**.

[1] The Council conclusions on the review of the ERA advisory structure, adopted on 1 December 2015, state that the ERA-related groups 'will provide a short annual update to ERAC on progress and impact against the ERA Roadmap and that ERAC will annually report to the Council to ensure that Council is regularly and comprehensively sighted on progress'.

b) Key achievements

1. ERA Priority 1 – More effective national research systems, led by ERAC

In 2018 the first triennial **Review of the ERA advisory structure** took place. It was agreed that the 2018 Review of the ERA advisory structure should seek a light, evolutionary approach and avoid a complete overhaul of the ERA Priorities.

The final report of the Review was adopted at the ERAC plenary in September, followed by Council conclusions on the governance of the ERA that were adopted on 30 November 2018.

In December 2018, ERAC decided to establish an Action Plan to implement the Council conclusions. The Action Plan covers the period 2019-2021.

In 2018 ERAC continued the **implementation and monitoring of the impact of the ERA National Action Plans** (NAPs). It was agreed that all the ERA-related groups would report on the progress of their respective ERA Priority with a view to submitting a report over the course of 2019. The results of the monitoring exercise will feed into reflections on future ERA Priorities.

In 2018 ERAC made its contribution to the work on the **partnership instruments in R&I** in view of the Horizon Europe Framework Programme for R&I. To this end, ERAC set up an Ad-hoc Working group (WG) on Partnerships. ERAC adopted the final report of the Ad-hoc WG at its plenary in December 2018.

In December 2017 it was decided that ERAC should hold discussions on strategic, cross-cutting and new emerging policy topics. Consequently, in September 2018 ERAC had strategic debates on how to optimise the efficiency and effectiveness of the national R&I systems and on tax incentives. In December 2018 ERAC agreed to hold these strategic debates twice per year. These debates should lead to practical conclusions and their outcome should feed into preparations of future ERA ministerial conferences.

2. *ERA Priority 2a – Optimal transnational cooperation and competition, led by the High Level Group for Joint Programming (GPC)*

2018 was an important year, as GPC celebrated the tenth-year anniversary of the Joint Programming Process that had been launched at the end of 2008. In that regard the event, organised by the Austrian Presidency and the 10 JPIs, was an important milestone that allowed stock to be taken of achievements and paved the way for the future. In 2018 the future of Joint Programming continued to be an important topic in relation to the new approach on partnerships, which is strongly connected to the GPC. This topic will continue to be of great relevance in 2019 as the GPC will continue to work on Joint Programming in connection with the future Forum, but will also explore new activities.

3. *Priority 2b – Research infrastructures, led by European Strategy Forum on Research Infrastructures (ESFRI)*

In 2018, ESFRI contributed to progress on ERA Priority 2b through three main actions:

- Firstly, the ESFRI Roadmap 2018 was completed and published. The new Roadmap, adopted on 28 June 2018, consists of 18 'ESFRI Projects' (including six new ones), which are new initiatives currently in development phase requiring around EUR 2.9 billion of investments in the coming years, and 37 'ESFRI Landmarks' (including eight new), identifying key research infrastructures that have been completed or are under construction, representing an overall capital value of around EUR 14.4 billion. It also analyses the European landscape of RIs and their interconnections across research domains.

- Secondly, in response to the Competitiveness Council conclusions of 29 May 2018 on *Accelerating knowledge circulation in the EU*, ESFRI established a dedicated *ad-hoc* Working Group to develop a common approach for the monitoring of Research Infrastructure performance.

- Thirdly, ESFRI published a position paper on EOSC indicating willingness on the part of ESFRI, according to its scope and mandates, to contribute to the shaping of the EOSC project. Throughout the year, ESFRI engaged in dialogue with Research Infrastructures on the opportunities and challenges linked to EOSC implementation.

4. Priority 3 – Open labour market for researchers, led by the ERAC Standing Working Group on Human Resources and Mobility (SWG HRM)

The main achievements of the SWG HRM in 2018 included participation in the Bulgarian Presidency Informal Meeting of Ministers responsible for Competitiveness for the Workshop '*The future of R&I in Europe: investing in human capital*' in February, which enabled a high-level policy debate on issues concerning human resources in research and Priority 3 of ERA. Also, participation in the Workshop prior to the ERAC plenary on the '*Links between Priority 1 and 3*' (*Effective national R&I systems and Open labour market for researchers*), which provided conclusions and areas to further explore at Member State-level for ERAC.

5. Priority 4 – Gender equality and mainstreaming in research, led by the ERAC Standing Working Group on Gender in Research and Innovation (SWG GRI)

In 2018, the SWG GRI reported on the implementation of gender equality actions contained in the 2015 Council Conclusions on Advancing Gender Equality in the ERA and provided recommendations. It adopted a policy brief 'Tackling gender bias in research evaluation: Recommendations for action for EU Member States'. Stress was also put on cooperation with other ERA groups: firstly, SWG GRI provided input on gender and open innovation to the SWG Open Science and Innovation Task Force on Open Innovation, with a view to producing a policy brief on gender and innovation in 2019. Secondly, the joint efforts of SFIC and GRI were welcomed as an example of good practice for collaboration across different ERA priorities in the November 2018 Council Conclusions on ERA governance. Lastly, SWG GRI exchanged on national positions on gender during negotiations on Horizon Europe, with a view to maintaining gender equality as a priority.

6. Priority 5 – Optimal circulation, access to and transfer of scientific knowledge, led by the ERAC Standing Working Group on Open Science and Innovation (SWG OSI)

In 2018, the SWG OSI concluded its in-depth assessment of the Amsterdam Call for Action on Open Science and presented the results of its work to the Research Working Party in February 2018. This, together with the Opinion of the ERAC SWG OSI on the European Open Science Cloud (EOSC) Governance Models and Strategic Implementation Plan, helped to inform the then-ongoing discussions on the Council Conclusions on the EOSC. The SWG OSI also continued discussions with the Commission to develop a workable governance model and implementation roadmap for EOSC. In 2018 the SWG OSI also delivered its Recommendations on Open Science and Innovation to ERAC, which should help to guide the implementation of the ERA Priority 5 at national level.

7. Priority 6 – International Cooperation, led by the Strategic Forum on International Cooperation (SFIC)

In recent years, SFIC has played an important role in driving forward the EU-Member States partnership on international S&T cooperation as well as in contributing to the external dimension of the ERA, mainly by providing strategic advice to the Commission, the Council and ERAC, and committing to common priorities while developing joint EU/Member States/Associated Countries-SFIC initiatives. Thus, in 2018 SFIC issued two opinions on strategic issues: Horizon Europe and gender balance in international cooperation; launched a working group on benchmarking of national action plans in order to identify key issues to be used in a mutual learning exercise; finalised its work on a shared toolbox for international cooperation and managed to include part of the relevant elements in the R&I observatory website.

c) List of Chairs

ERAC Co-Chairs:	Robert-Jan Smits and Christian Naczinsky (Jean-Eric Paquet replaced Robert-Jan Smits as from 01/05/2018)
GPC Chair:	Leonidas Antoniou
ESFRI Chair:	Giorgio Rossi
SWG Human Resources and Mobility Chair:	Cecilia Cabello Valdés
SWG Gender in R&I Chair:	Marcela Linkova
SWG Open Science and Innovation Chair:	Clara Eugenia García (Marc Vanholsbeek replaced, as acting Chair, Clara Eugenia García as from 25/11/2018)
SFIC Chair:	Rozenn Saunier

5. Appendix

Full reports from each ERA-related Group

Priority 1: More effective national research systems

ERAC is responsible for Priority 1 of the ERA Roadmap. The top action corresponding to ERA Priority 1 is 'Strengthening the evaluation of research and innovation policies and seeking complementarities between, and rationalisation of, instruments at EU and national levels'. In 2018 ERAC continued to focus on the best way to achieve the top actions defined in the ERA Roadmap and adopted by the Council in May 2015.

2018 Review of the ERA advisory structure

In 2018 the first triennial Review of the ERA advisory structure took place, following the preparations started at the ERAC plenary meeting in December 2017. In this meeting at Director-General level, the strategic landscape for Research and Innovation in Europe was discussed to identify the key strategic priorities that would require the attention of the Research and Innovation community. Input from the Research Policy Group also fed into the discussion, the final conclusion being that the 2018 Review of the ERA advisory structure should seek a light, evolutionary approach and that a complete overhaul of the ERA Priorities should be avoided.

On this basis, the ERAC Steering Board identified the scope of the review and defined its terms of reference. A rapporteur team was thus elected to proceed with the review and to draft the review report. As stipulated by the terms of reference, the review included an assessment of the output and performance of the ERA-related groups measured against their respective mandates and work programmes, as well as against the objectives of their respective ERA Priorities. Furthermore, an online survey was launched to establish the views of ERAC delegations, ERA-related groups and external stakeholders over the full scope of the review. A state of play of the exercise was presented at the ERAC plenary meeting in May, while the final report was adopted unanimously at the ERAC plenary meeting in September[2]. As a follow-up, and in accordance with the ERAC mechanism on the review, Council conclusions on the governance of the ERA[3] were adopted on 30 November 2018. The Council welcomed the efforts made by ERAC to review and adapt the ERA advisory structure.

2 doc. 1209/18.
3 doc. 14989/18.

At the ERAC workshop on 5 December 2018, one subgroup discussed the impact of the Council conclusions and the follow-up to the 43 recommendations contained in the aforementioned review report. Based on the findings of this subgroup, ERAC decided to establish an Action Plan that would translate the recommendations into concrete actions and contribute to the implementation of the Council conclusions. The ERAC Steering Board was tasked with discussing and possibly finalising the draft Action Plan with a view to its adoption at the ERAC plenary meeting on 21-22 March 2019. Details of this exercise and its results will be given in the next Annual Report.

Follow-up to the implementation and monitoring of the impact of the ERA National Action Plans

In 2018 ERAC continued follow-up on the implementation and monitoring of the impact of the ERA National Action Plans: two ERA workshops were organised back-to-back with the ERAC plenary meetings in March and December. Based on the outcome of the discussions at the latter workshop, at its December plenary meeting ERAC held a debate on simple and coherent monitoring of the ERA National Action Plans. It was agreed that all the ERA-related groups would report on the progress of their respective ERA Priority by the end of March 2019, and that by June 2019 ERAC itself would take stock of Priority 1 progress. The results of the whole monitoring exercise would feed into the reflections on future ERA Priorities. Details of the exercise and its results will be given in the next Annual Report.

ERAC Ad-hoc Working Group on Partnerships

As part of its role as strategic policy advisor to the Council, the Commission and the Member States, in 2018 ERAC also made a contribution to the work on the partnership instruments in research and innovation. At the informal meeting of Competiveness Ministers (Research) on 25 July 2017, Ministers had requested an in-depth analysis of the function of the innovation partnerships and their possible improvement in view of the next Framework Programme for Research and Innovation (Horizon Europe). In response, at its plenary meeting in September 2017 ERAC envisaged the establishment of an Ad-hoc Working group (WG) on Partnerships to assess the coherence of the partnership instruments in Research and Innovation. The mandate of the Ad-hoc WG, approved by ERAC at its plenary meeting in December 2017, was to translate ambitious policy plans into a concrete set of requirements and strategies for this new generation of R&I partnerships to become operational under Horizon Europe. The Ad-hoc WG had eight meetings between December 2017 and December 2018 and prepared four reports on 'Criteria for selecting, implementing, monitoring and phasing out of R&I partnerships', 'Rationalising the EU R&I partnership landscape and optimising its coherence', 'Requirements for the set-up of a strategic coordinating process for the selection, implementation, monitoring and phasing out of R&I partnerships' and 'Efficiency of implementation of partnerships' that ERAC adopted at its plenary meetings in May and September 2018. At the ERAC plenary in December 2018 the final report of the Ad-hoc WG was adopted[4].

[4] doc. 1215/18.

Strengthening ERAC's strategic capacity

At the ERAC plenary at Directors-General level in December 2017, many delegations had indicated that, to strengthen its strategic capacity, ERAC should hold discussions on strategic, cross-cutting and new, emerging policy topics. Consequently, at its plenary meeting in September 2018 ERAC had a first strategic debate on two topics: how to further optimise the efficiency and effectiveness of the national Research and Innovation systems (Priority 1 of the ERA Roadmap), with a focus on performance-based funding of public research; and tax incentives on Research and Development. At its plenary meeting in December 2018, ERAC discussed how best to institutionalise strategic policy debates on a regular basis, in the same manner as the one held in September. It agreed to hold strategic debates regularly (twice per year). These strategic debates should lead to practical conclusions, and their outcomes should feed into preparations of future ERA ministerial conferences. To prepare the strategic debates at ERAC plenary meetings, ERAC could also organise informal preparatory meetings in innovative and dynamic formats.

Priority 2a: Optimal transnational cooperation and competition

The High Level Group for Joint Programming (GPC) is responsible for Priority 2a of the ERA Roadmap, 'Jointly Addressing Grand Challenges'.

The main actions of the GPC during 2018 were:

1 Contributing to the discussion on the Future of Joint Programming Process

ERAC Ad-hoc Working Group on Partnerships

The Chair, Vice-Chair and some delegates of the GPC contributed to the work of the ERAC Ad-hoc WG on Partnerships. In particular, the importance of including the Joint Programming Process and Joint Programming Initiatives (JPIs) in the strategic coordinating process was clearly emphasised.

Moreover, the IG3 report adopted in 2016 can be considered as a substantial contribution to the work on partnerships in 2018; the report had a real impact, because the IG3 criteria have been an important source of inspiration in defining criteria for the future selection and monitoring of R&I partnerships in the context of the new approach for partnerships in Horizon Europe.

10-year Joint Programming Event

The conference '10 Years Joint Programming - Achievements and the Way Forward' was organised in Vienna, under the Austrian Presidency of the Council of the EU on 19 and 20 September 2018.

During the conference, a joint JPI Chairs declaration named 'Driving research and innovation to address global challenges' was presented. The declaration summarises the JPIs' views and ambitions for their future development and impact and sets the common aim of strengthening Europe's pioneering role in achieving the United Nations Sustainable Development Goals Agenda 2030. The declaration was handed over to the Chair of the GPC.

This conference was an important milestone as it allowed the achievements of the Joint Programming Process to be showcased, and also facilitated discussion of the future of JP in relation to the future of European R&I (European Research Area and the Framework Programme).

Legal structure for JPIs

In 2018, JPI Oceans presented to the GPC the state of play on the implementation of the AISBL (international non-profit association). This involved giving full information to delegations on this option that could potentially be followed by other JPIs. This is thus important in the context of the future of JPIs and the issue of sustainability.

2 Monitoring JPIs

In 2017, all 10 JPIs published their Long-Term Strategies, based on the work done jointly with the GPC working group on the future of JP. The GPC subsequently decided to carry out an analysis of those strategies, and the task force in charge of this work was coordinated by the Swedish delegation.

The final report on the analysis of the Long Term Strategies of the JPIs was adopted by the GPC in September 2018. This report includes several important parts:

– A qualitative assessment of the JPIs' Long Term Strategies, including both good practices and challenges

– A quantitative assessment of JPIs based on the information included in those strategies, and using the IG3 criteria as a framework

– An analysis of the JPIs' collaboration patterns

– A set of recommendations on JPIs and JPP in general addressed to all stakeholders, including Member States, Associated Countries and the Commission.

3 Measuring progress and implementation of Priority 2a of the ERA Roadmap

The GPC decided to create a mechanism in order to monitor, on an annual basis, the implementation of the Priority 2a actions contained in NAPs and Strategies.

For this purpose, an Excel progress tool was developed, which allows delegates to answer questions that lead them to a final answer, which is then marked in progress sheets on a progress scale:

FINISHED // ON TRACK // ON-GOING WITH DELAY // POSTPONED // TERMINATED // CANCELLED.

The idea is to show how the whole of Priority 2a is progressing and not to compare countries on individual actions.

The analysis was based on 29 NAPs of 24 MS and five AC including 97 actions. According to this monitoring exercise, most (71 %) of the actions are on track and few are ongoing with delay while only four actions have been postponed or cancelled.

This tool was then presented to the ERAC and other ERA-related groups and was considered as a good practice to be used by all groups (with adaptation) for monitoring actions from NAPs in their respective priorities.

4 Improving Alignment and Interoperability

The GPC organised a session in June to discuss the follow-up of the Mutual Learning Exercise (MLE) on alignment and interoperability that took place between 2016-2017 and was originally initiated by the GPC.

This was an opportunity to take stock of the impact of this MLE at national level. Indeed, actions took place in several countries, and there were showcases from Estonia and Slovenia. This also allowed countries that did not participate in this MLE to learn more about the outcomes of this exercise and they were thus encouraged to promote changes at their own national level.

Priority 2b: Research infrastructures

The European Strategy Forum on Research Infrastructures (ESFRI) is responsible for Priority 2b of the ERA Roadmap.

Within its general mandate to support a coherent and strategy–led approach to policy making on research infrastructures in Europe, during 2018 ESFRI contributed to the progress of the ERA through the following actions:

1 ESFRI Roadmap 2018

In 2018, ESFRI finalised its Roadmap update process, which started in 2017 and included a call for new proposals, an update of the research infrastructure landscape analysis, progress monitoring of Projects on the ESFRI Roadmap and a pilot review of ESFRI Landmarks. The new Roadmap, adopted on 28 June 2018, consists of 18 'ESFRI Projects', which are new initiatives in the development phase requiring around EUR 2.9 billion of investments in the coming years, and 37 'ESFRI Landmarks', identifying key research infrastructures that have been completed or are under construction, representing an overall capital value of around EUR 14.4 billion.

The Roadmap was publicly launched at a dedicated Austrian Presidency event on 11 September 2018, attracting around 250 participants in Vienna and some 600 viewers who joined live online. The Roadmap was welcomed by the Competitiveness Council in its conclusions of 30 November 2018.

New ESFRI Projects

ESFRI included six new Projects in the following areas:

- Energy
    - **IFMIF-DONES**: International Fusion Materials Irradiation Facility - DEMO Oriented NEutron Source (coordinated by Spain) – a facility for testing, validation and qualification of the materials to be used in a fusion reactor

- Environment
    - **DiSSCo**: Distributed System of Scientific Collections (coordinated by the Netherlands) – an infrastructure integrating natural history collections of major European institutions
    - **eLTER**: Long-Term Ecosystem Research in Europe (coordinated by Germany) – an infrastructure integrating ecosystem research sites across Europe
- Health and Food
    - **EU-IBISBA**: Industrial Biotechnology Innovation and Synthetic Biology Accelerator (coordinated by France) – a multidisciplinary research and innovation infrastructure for industrial biotechnology
    - **METROFOOD-RI**: Infrastructure for promoting Metrology in Food and Nutrition (coordinated by Italy) – an infrastructure for metrology services in food and nutrition throughout the value chain
- Social and cultural innovation
    - **EHRI**: European Holocaust Research Infrastructure (coordinated by the Netherlands) – an infrastructure for research on the Holocaust

The new Roadmap also identified two areas with good potential for the development of new research infrastructures: religious studies and transition to open science.

New ESFRI Landmarks

Research Infrastructures included in the ESFRI Roadmap have 10 years to enter the implementation stage. ESFRI regularly monitors their progress to review the current situation, identify the most important challenges and facilitate their implementation. As a result of this review, ESFRI identified eight new Research Infrastructures that can be considered as having been implemented and, due to their scope, their specific reference role in their domains and their importance for the European Research Area, have obtained the status of ESFRI Landmark:

- **CTA** – Cherenkov Telescope Array
- **ECCSEL** – European Carbon Dioxide Capture and Storage Laboratory Infrastructure
- **EISCAT_3D** – Next Generation European Incoherent Scatter Radar System
- **EMBRC** – European Marine Biological Resource Centre
- **EPOS** – European Plate Observing System
- **ERINHA** – European Research Infrastructure on Highly Pathogenic Agents
- **EU-OPENSCREEN** – European Infrastructure for open screening platforms for chemical biology
- **Euro-Bioimaging** - European Research Infrastructure for imaging technologies in biological and biomedical sciences

Landscape Analysis

The updated Landscape Analysis (LA) is a key ingredient of the ESFRI Methodology. It captures the most relevant Research Infrastructures available to European scientists and technology developers, and allows an appreciation of the unique contribution made by the ESFRI RIs. It is a prerequisite for the ESFRI strategy exercise, as any new Project or Landmark must be evaluated against its impact on the Landscape. Consequently, the LA is a key reference for the understanding of the Roadmap, its content and its analysis.

In particular, the LA describes the state of play of all RIs in the corresponding thematic area, their contributions to support frontier research and to provide key-data necessary to address the Grand Challenges. The gaps, challenges and future needs are analysed for each group of thematic RIs. As research develops both within disciplinary domains and across disciplinary borders, ESFRI identifies the relevant connections that already exist among the ESFRI RIs, as well as the critical needs for new links and new practices, which would effectively support research on complex phenomena such as, for example, climate change, population ageing or food and energy sustainability. In the final part, cross-cutting aspects of the ensemble of RIs are addressed, such as education and training, digital infrastructure needs, contribution to innovation, and socio-economic impact.

Pilot review of ESFRI Landmarks

The Competitiveness Council of 27 May 2016[5] requested that ESFRI 'periodically assess the scientific status of ESFRI Landmarks'. In order to establish an effective methodology for this process, which would be both useful to national governments and would bring added value to ESFRI research infrastructures, a pilot review was carried out in collaboration with four selected Landmarks that had agreed to participate in the process. Initial conclusions have already been discussed in the Forum and the final methodology will be agreed upon by ESFRI in 2018, in broad consultation with the research infrastructures.

5 Council Conclusions of 27 May 2016 on 'FP7 and the Future Outlook: Research and innovation investments for jobs, growth and solutions to societal challenges'.

2 Monitoring of Research Infrastructures performance

The Competitiveness Council Conclusions of 29 May 2018 on *Accelerating knowledge circulation in the EU* contained an invitation to Member States and the Commission to develop a common approach for the monitoring of Research Infrastructure (RI) performance[6] within the framework of ESFRI.

In response to the Council mandate, ESFRI decided to establish an Ad-hoc Working Group on Monitoring, whose starting point was a dedicated Workshop on 'Monitoring of RIs, periodic update of Landmarks, use of Key Performance Indicators (KPIs)', organised in Milan on 19-20 November 2018.

The workshop explored the rationale and perspectives for developing a common monitoring methodology. In particular, a number of topics posing specific challenges were discussed, such as the merits and limits of KPIs, implementation of FAIR+R data principles, EOSC-readiness and their implications for RIs' performance and sustainability as well as harmonisation of RI costs and financial flows reporting throughout the lifecycle.

The event was concluded with a formulation of a workable way forward for developing a common monitoring methodology, which should first collect evidence from existing processes, in particular those already developed by the RIs themselves. A future methodology could include both key performance indicators and key impact indicators in order to help RIs optimise their activities, investments and budget. Any method developed should be offered, in particular, to those RIs that have not yet developed their own, and should be helpful to the RIs that have already established one.

[6] Council Conclusions of 29 May 2018 on Accelerating knowledge circulation in the EU. Doc 9507/18 (http://data.consilium.europa.eu/doc/document/ST-9507-2018-INIT/en/pdf).

3 European Open Science Cloud (EOSC)

Due to the importance of RIs for the development and implementation of EOSC, and in its role as strategy hub of funders for e-Infrastructures, ESFRI formulated a position on EOSC, which was published in January 2018.

ESFRI underlined that a close and effective collaboration between EOSC and the ESFRI Forum was needed to ensure convergence of strategies and implementation actions. A continuous dialogue between ESFRI and EOSC at strategic level, as well further collaboration at all levels of implementation, will ensure and enhance synergies and will effectively promote the adoption of FAIR data principles.

ESFRI Landmarks and Projects are RIs that produce scientific data and that are operated by highly competitive and broad research communities covering most areas of research. ESFRI RIs are amongst the key pillars of research that already perform quality checks on the open access data and have data management plans agreed by users. EOSC should recognise and take full advantage of these well-performing data management plans and practices that already implement FAIR and reproducibility criteria of the data and operate open access portals. EOSC should fill in gaps where there are unstructured areas, transparently display which services already exist and where, and help to develop metadata standards for overall progressive alignment of different domains and their increasing integration.

EOSC should make high-level interoperability possible and workable. In this respect, the role of EOSC in facilitating and improving the interoperability of existing well-developed data systems –including those of RIs – and guiding the development of interoperable data systems in unstructured areas is crucial and irreplaceable.

Priority 3: Open labour market for researchers

The ERAC Standing Working Group on Human Resources and Mobility (SWG HRM) is responsible for Priority 3 of the ERA Roadmap.

During 2018 the main achievements of the SWG HRM included the following:

a) At the Informal Meeting of Ministers responsible for Competitiveness (1-2 February 2018, Sofia, Bulgaria), the SWG HRM contributed by participating in the Workshop organised on '*The future of R&I in Europe: investing in human capital*'. A position paper was prepared that briefly addressed the human capital dimension of R&I in the EU on many issues related to Priority 3 such as trans-national and inter-sectoral mobility and inter-disciplinary collaboration, the skills and training of researchers, funding, linking R&I and higher education policies, optimising the benefits of research collaboration and open science collaboration, etc. Ministers at the informal Council were invited to explore best practices and possible joint (new or improved) measures to ensure the availability in the coming years of a sufficient number of mobile and appropriately skilled scientists and researchers across the EU on the basis of several questions, including: How can we ensure a more systemic approach to ensure that researchers possess the necessary skills to link up with business and industry? How could a European Professional Researchers' Career Development Framework boost the attractiveness of a research career and achieve more optimal brain circulation? The conclusions and issues raised at the workshop by the ministers contribute to the high-level policy debate in Europe on the issues concerning human resources in research and Priority 3 of the ERA.

b) At the ERAC plenary held on 15-16 March 2018 in Plovdiv, Bulgaria, the SWG HRM contributed by participating in the Workshop organised on the '*Links between Priority 1 and 3*' (*Effective national R&I systems and Open labour market for researchers*). A position paper was prepared that briefly addressed the issues of how effectively designed and efficiently functioning national research and innovation systems depend, among other things, on the capacity to learn from one's own experiences and from good European practices backed up by the accumulation of knowledge within the policy-making process and in research management at all levels. Therefore, there was discussion on the links between Priority 1 and Priority 3, and on how to achieve the goal of a truly open and excellence-driven ERA in which highly skilled and qualified people could move seamlessly across borders, sectors (e.g. academia and industry) and disciplines to where their talents could be best employed to advance the frontiers of knowledge and support innovation throughout Europe and beyond.

The following conclusions were presented to the plenary meeting of ERAC:

– There is a strong relationship between human resources policies and measures that improve open labour market and effective/efficient R&I systems

  - *Need to measure and monitor the impacts and how they affect the R&I system as a whole. More data and information is needed*

  - *Need to improve the inter-exchange of researchers between academia and industry; this will strengthen and improve R&I systems*

– An open labour market for researchers is not just a European issue, it's a global one

  - *Better understanding of the whole 'ecosystem' of R&I; brain drain/brain gain and other issues (such as language) need further study*

Finally, in the review process of Priority 3, the National Action Plans of the ERA roadmaps for European countries show that more attention is being paid to open, transparent and merit-based recruitment procedures, as well as to potential measures to further facilitate the international mobility of researchers that includes equal access to national research funding programs for foreign researchers. Additional measures include the further development of human resources procedures in research performing institutions, career development to reinforce new and improved skills and competencies for researchers, amongst others. The meetings of the group have allowed delegates to provide insights on policies and measures that are carried out in their respective countries in order to share best practices and experiences.

Priority 4: Gender equality and mainstreaming in research

The Standing Working Group on Gender in Research and Innovation (SWG GRI) is responsible for Priority 4 of the ERA Roadmap.

ACTIONS CONTRIBUTING TO THE PROGRESS OF ERA IN ERA PRIORITY 4

Report on the implementation of Council Conclusions of 1 December 2015 on Advancing Gender Equality in the ERA

The main focus of the SWG GRI's work in 2018 was an analysis on the implementation of the Council Conclusions of 1 December 2015 on Advancing Gender Equality in the ERA. To this end, the group formed a subgroup which designed a questionnaire and collected answers from 17 Member States and five Associated Countries. The report, adopted by the SWG GRI and presented to ERAC, concluded that important steps had been made in several countries and their Research Funding Organisations. These Council Conclusions, together with the ERA Roadmap, were an important instrument in advancing gender equality policy. However, a large gap persists between higher and lower innovators. There have been some positive developments in several countries (CZ, MT, SI) but the situation has not progressed in others, usually in countries with a high proportion of women among researchers in R&I. The report presented recommendations to Member States and Associated Countries as well as to the Commission, including stepping up actions on gender equality in lower innovation countries and focusing on monitoring and evaluating gender equality policies in higher innovation countries. The report also strongly encourages Member States to seek ways to provide financial incentives at national level for promoting institutional change through gender equality plans. ERAC acknowledged that more should be done on the link between gender and innovation.

Policy Brief on Gender Bias

Following a mutual learning exchange on actions to eliminate gender bias in research evaluation at national level, a policy brief 'Tackling gender bias in research evaluation: Recommendations for action for EU Member States' was drafted and adopted on 3 September 2018. The policy brief shows that there are major differences among countries, which can be clustered into five groups: 1) little awareness, no policy or action; 2) some awareness, uncertainty as to which actions to take; 3) awareness growing, measures under preparation; 4) action taken by RFOs; and 5) coordinated action by RFOs and RPOs embedded in national policy. The policy brief presented recommendations on the following priority issues: Statistical data collection and monitoring; Gender bias training for staff and evaluators; Gender experts on evaluation panels; Gender observers on evaluation panels; Formalisation and transparency of the evaluation process; Gender balance on evaluation panels; Double-blind review; Gender mainstreaming of funding programmes, particularly eligibility rules and evaluation criteria; Open Science; Gender proofing of language of call texts; and Accountability. The appendix provided an overview of selected measures adopted by RFOs for minimising implicit gender biases in evaluations of research proposals. This work complements previous work carried out by the Commission (workshop on implicit gender biases during evaluations, and follow-up report, in 2017) and by ERA stakeholder organisations (Science Europe 'Practical guide to improve gender equality in research organisations' in 2017, and LERU Advice Paper No. 23 on implicit bias in academia in 2018).

ERA and implementation of NAPS

SWG GRI contributed to the ERA Progress Report 2018 regarding ERA Priority 4. Members of the SWG GRI played an active role in actions developed under the Horizon 2020 project GENDERACTION aimed at national representatives in Priority 4. Specifically, members of the SWG GRI participated in the first Mutual Learning Workshop on ERA Priority 4 within the National Action Plans (NAPS), which focused on (1) gathering feedback for an initial analysis of priority 4 implementation within NAPs, (2) developing criteria for good practices, both at the level of NAPs and at the level of concrete policies and measures, and (3) initiating an exchange between countries with different approaches to gender equality. The second Mutual Learning Workshop for SWG GRI members took place on 7 and 8 March 2019, and focused on ERA Priority 4 indicators and monitoring.

Cooperation with other ERA-related groups

– A joint SWG GRI and SFIC opinion on developing joint guidelines on a gender perspective for international cooperation in Science, Technology and Innovation was delivered in January 2018, with recommendations for the Commission, Member States and Associated countries. These joint efforts were outlined in the Council Conclusions of 30 November 2018 on the Governance of the European Research Area, as an example of good practice for collaboration across different ERA Priorities.

– The SWG GRI organised a mutual learning exchange on gender in innovation and invited a representative of the ERAC SWG on Open Science and Innovation's Task Force on Open Innovation to discuss gender equality issues that might be relevant for Open Innovation. The SWG GRI drafted input, including on areas of action and recommendations, for the Task Force on Open Innovation and commented on a draft report. Following the mutual learning exchange, the SWG GRI is working on a policy brief on gender and innovation to be delivered in the first half of 2019 in line with its Work Programme.

Cooperation with the EU Presidency

In preparation for the 20th anniversary of EU activities to support gender equality in R&I, the Finnish Presidency will organise a presidency conference in October 2019 with the support of the Commission through Horizon 2020. In view of this conference, the SWG GRI provided ideas and suggestions for topics to be addressed. Several members and the Chair of the SWG GRI continue to cooperate on the preparation of the planned conference.

Cooperation with the Commission

In January 2018 the Commission published 'Guidance to Facilitate the Implementation of Targets to Promote Gender Equality in Research and Innovation', which had initially been prepared with the Helsinki Group on Gender in Research and Innovation. The report details examples of national actions and adopted measures which were updated and fact-checked by SWG GRI members. The Commission also presented the state of preparation of She Figures 2018 to SWG GRI members, and circulated a draft to members of the SWG GRI for comments.

ACTIONS CONTRIBUTING TO THE IMPLEMENTATION OF TOP ACTION IN PRIORITY 4 AT NATIONAL LEVEL

SWG GRI members distributed the outputs of the group widely to ministerial bodies as well as to a wide range of other stakeholders, and engaged in exchanges on the recommendations to national authorities, RFOs and RPOs. The group delivered content on:

1) Guidance to Facilitate the Implementation of Targets to Promote Gender Equality in Research and Innovation,

2) Policy Brief 'Tackling gender bias in research evaluation: Recommendations for action for EU Member States', and

3) Results and recommendations of the analysis of the implementation of the Council Conclusions on Advancing Gender Equality in the ERA.

The main recipients of these findings and recommendations were ERAC delegates and delegates in other ERA-related groups, relevant organisational units in the national authorities, RPOs and RFOs. In many countries, the SWG GRI outputs have contributed to raising awareness and shaping the policy debate.

In several countries (such as CZ, EE, ES and IL) the SWG GRI recommendations have been considered in negotiations of new strategic documents, including in preparations of national positions on Horizon Europe; they have been incorporated into national strategic or governance-related documents, and new indicators have been implemented.

SWG GRI members actively participated in the Horizon 2020 GENDERACTION Mutual Learning Workshop on criteria for good practice in the design of Priority 4 actions in the National Action Plans and Strategies, where they delivered presentations of good practices identified at national level. These presentations and the small group discussions that followed informed the development of criteria for good practice that arose from the workshop. The recommendations were distributed at national level. The topics covered were: increasing the number of female professors, performance contracts, monitoring, gender in research content, gender equality plans and evidence-based policy development.

ACTIONS CONTRIBUTING TO THE IMPLEMENTATION OF PRIORITY 4 TOP ACTION AT EUROPEAN LEVEL

The SWG GRI members exchanged views on national positions on gender for the negotiation of Horizon Europe, with a view to maintaining gender equality as a priority area post 2020.

Priority 5: Optimal circulation, access to and transfer of scientific knowledge

The ERAC Standing Working Group on Open Science and Innovation (SWG OSI) is responsible for Priority 5 of the ERA Roadmap: optimal circulation, access to and transfer of scientific knowledge.

The ERAC SWG OSI's work focused on three main items during 2018:

In the framework of its specific ERA Priority, in 2018 the SWG OSI focused on sharing good practices among delegations to enhance the progress of ERA as regards Priority 5, particularly in the context of developing the assessment of the Amsterdam Call for Action on open science. In addition, the results of the Mutual Learning Exercise on open science (with a focus on altmetrics and rewards), were presented in May 2018. In 2018 the SWG OSI also started sharing good practices on open innovation, via presentations of case studies from Denmark, Sweden and Austria.

At national level, the SWG OSI contributed to the top action priority it is responsible for by delivering a set of Recommendations on Open Science and Innovation to ERAC, as mandated by ERAC in the SWG OSI's Mandate, in order to help Member States and Associated Countries pursue a national and European policy on open science and open innovation. The Recommendations support a holistic approach on Open Science that focuses on research production, dissemination and evaluation. The set of recommendations is inclusive, not focusing on any particular pathway(s) to Open Science. It also presents a starting point for bridging open science and innovation and is especially directed at open practices that are part of and stimulate both science and innovation.

At European level, the SWG OSI contributed to the top action priority it is responsible for as follows:

Assessment of the Amsterdam Call for Action on Open Science

The Council, through its 2016 Council conclusions on the transition towards an Open Science system, invited the ERAC SWG OSI to assess the proposed actions on the Amsterdam Call for Action on feasibility, effectiveness and prioritisation, and to report on this. The Amsterdam Call for Action aimed to provide a roadmap to guide public policies on research towards open science. The SWG OSI pointed out in its assessment adopted in February 2018 that there was not a one-size-fits-all approach and that the exercise carried out by the SWG OSI represented a first step towards providing insights into the challenges for science and innovation policies, and into the policies that should be preserved, modified or even disregarded, and those that needed to be formulated in order to respond to the new context of open science. The SWG OSI presented the results of its work to the Research Working Party in February 2018.

Opinion on the European Open Science Cloud (EOSC) Governance Models and Strategic Implementation Plan

In line with the May 2018 Council conclusions on the European Open Science Cloud, in which the Council invited the Commission and all Member States to set up an EOSC governance framework with the effective involvement of all Member States, in close consultation with ERAC, the SWG OSI's Opinion, adopted in October 2018, focused on the EOSC governance model and did not address other aspects outlined in the Commission's March 2018 Staff Working Document 'Implementation Roadmap for the European Open Science Cloud'. Indeed, the SWG considered EOSC governance to be a fundamental pillar to ensure feasible and effective strategic implementation planning. The SWG stated in its Opinion that it was important to strengthen the main rationale for the EOSC as a significant step forward in improving the quality, efficiency and impact of scientific research; it also highlighted that communication towards stakeholders, scientists and the lay audience is crucial to the success of the EOSC, and that the EOSC should be characterised by a 'user-centred' approach to be reflected in the governance structure. Furthermore, the SWG OSI supported the two-stage approach to EOSC governance, with Phase 1 focusing on the process of developing the EOSC and Phase 2 focusing on the implementation, management and operational aspects of the EOSC. The SWG also indicated that responsibilities, activities and timescales in both phases required substantial further clarification and analysis.

The SWG OSI has maintained ongoing discussions with the Commission on the development and implementation of EOSC and will continue to do so.

Recommendations to ERAC on open science and innovation

As mandated by ERAC in the SWG OSI's Mandate, in December 2018 the SWG delivered its recommendations on the need to pursue a national and European policy towards an open science system, in accordance with the 2016 Council Conclusions on the transition towards an Open Science system. In particular, the SWG OSI recommended that ERAC:

1. Consider 'immediate FAIR and open' as the default for all research output.
2. Promote and protect open science within the European copyright legal framework.
3. Develop and advocate an understanding of innovation between Member States that is built on open science.
4. Develop end user skills for better appropriation of knowledge deriving from research.
5. Foster the involvement of citizens in science.
6. Adjust assessment, reward, and evaluation systems.
7. Foster open peer review as the default legitimate approach for scientific validation.
8. Require that infrastructures, processes and workflows underpinning the European research system adhere to and adopt open standards.
9. Facilitate full transparency for terms and conditions of subscription agreements and open access deals.

Priority 6: International cooperation (SFIC)

The Strategic Forum for International S&T Cooperation (SFIC) is responsible for Priority 6 of the ERA Roadmap: International Cooperation.

The SFIC Work Programme groups the SFIC's seven main activities - as set out in its mandate - into five areas of action**.** The priority areas reflect the SFIC's strategic mission and balance ongoing SFIC initiatives with new activities, building on work already done and the current international context. Although many SFIC activities contribute to the implementation of the ERA Roadmap, and SFIC members and observers feel that the five areas of action overlap in many respects, the approach followed has been to keep specific activities (e.g. related to information sharing or best practice) under the particular specific heading.

1. In terms of strategic advice on international S&T cooperation, several important documents were produced by the SFIC during 2018. The following can be highlighted:

    - The SFIC - together with the ERAC Standing Working Group on Gender in Research and Innovation - prepared an opinion on developing joint guidelines on a gender perspective for international cooperation in science, technology and innovation (STI)[7]. This opinion aims to provide input for the preparation of the next multiannual framework programme for research and innovation. The opinion was based on a survey carried out by the SFIC between April and June 2017 among government representatives and funding agencies to explore the current situation at national and organisational level. The survey results demonstrated the existing difficulties in including gender issues in international STI cooperation and showed the importance of developing joint guidelines on gender aspects.

[7] 1352/18

- At the last plenary in 2018, the SFIC adopted an opinion on international cooperation in 'Horizon Europe'[8]. The opinion emphasised that international cooperation in R&I should remain a key priority for future European policies. It called for the international cooperation strategy to be clearly spelt out in the context of Horizon Europe and to streamline international cooperation throughout Horizon Europe. The opinion also sets out broad lines delineating the possible role of the SFIC in this context.

2. Concerning the development and implementation of the ERA Roadmap and cooperation with ERAC- and ERA-related groups, a strategic approach has been developed on how to strengthen and streamline the external dimension of ERA in line with the ERA Roadmap.

- In 2018, the SFIC approved a mandate for a working group to deal with the benchmarking of national ERA roadmaps (priority 6). Since then, the announcement on the selection of a mutual learning exercise (MLE) on international cooperation reinforced the process and its impact.

- The SFIC working group on a 'Toolbox for international cooperation' continued its work on developing a practical overview for Member States, Associated Countries and the Commission on the implementation of international STI agreements and other international STI cooperation activities at bilateral and multilateral level. The working group published a final report in 2018. Its objective was to provide a source of relevant experiences of other MS/AC and the Commission that could serve as input for the design and implementation of new instruments. The report focused on strategies and roadmaps, STI agreements, STI counsellors, aligned funding schemes, research and innovation networking activities, international research marketing as instruments in international STI cooperation.

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- Following the ERA review report, discussions within SFIC happened in 2018 and led to proposals for improving the organisation (inter alia through a strengthened steering board, the possible introduction of 'sentinel task forces' focusing on topical issues, correspondents with other ERA related groups, new meeting formats etc.). This will form an integral part of the work of SFIC in 2019/2020.

3. As regards the sharing and structuring of information and good practices on international R&I cooperation activities: this is a core role of the SFIC and SFIC members and observers, and they have contributed to peer-learning activities and to the exchange of best practice, mainly via exchange of information between delegations (e.g. on a bilateral basis, within SFIC Working Groups, via systematic *tour de table* of international activities during SFIC plenary meeting). The SFIC has continued to promote presentations during plenary meetings on EU/national STI strategies as well as on R&I cooperation activities and projects. This shall also serve to add a level of analysis to the sharing.

   In addition, to address the need for an overview of R&I international cooperation activities and information at the level of the EU, Member States and Associated Countries, at the SFIC's proposal the Commission agreed to include as much of the relevant information identified by the Toolbox Working Group as possible in the online Research and Innovation Observatory website (RIO).