

ERAC *ad hoc* WG on the future of the ERA

Deliverable 1:

Options for a new paradigm on the future of the ERA

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1. Background, Conclusions and Recommendations

1.1 Background

1. The European Research Area (ERA) is about to celebrate 20 years of its implementation. It was launched in 2000 based on the idea that Europe needed a Research Area with a European dimension. In 2008, it acquired directionality with the grand challenges approach and the “Ljubljana Process”, for governance along with a revised structure.
2. The European Commission confirmed its engagement in the ERA with its ERA communication in 2012, with an ensuing renewed partnership between Member States, the Commission and research stakeholders adopted in Council Conclusions¹.
3. With the adoption of the ERA Roadmap 2015-2020 and the related national ERA action plans, the national focus and dimension of ERA was strengthened and improved, while the European Commission focused more on a supporting and monitoring role.
4. Over the last two decades, a wide range of ERA related policy reforms and initiatives have been successfully implemented, contributing towards the overarching objective to realise the ERA.
5. The need for a new ERA paradigm is recognised in the European Leader’s agenda 2019-2024 which underlines that *‘we must step up investment in people’s skills and education, do more to foster entrepreneurship and innovation and increase research efforts, in particular by addressing the fragmentation of European research, development and innovation’*.

1.2 Conclusions

- The policy approach of the ERA Roadmap 2015 – 2020 to focus on national policy reforms and actions strengthened the role of ERA at national level because conditions at EU level were considered to be well in place by the European Commission. So, the ERA Roadmap 2015 included fewer initiatives and action at EU level, including those based on the essential role of the EU framework programmes for research and innovation in delivering a fully-functioning ERA.
- Progress on ERA implementation has been slowing down in recent years and there are still major disparities between countries and regions, some of which are even diverging rather than converging, as stated in the ERA Progress Report 2018.
- Despite the multiple achievements of ERA, an effective European dimension is missing in many national, including regional, R&I policies, hindering joint multi-level action, which is an essential element of a fully functioning ERA.
- This deficiency is leading to an insufficient co-evolution of European, national, including regional, R&I systems, that is building-up an unhealthy level of concentration of R&I excellence pockets across Europe. Moreover, it leads to an unbalanced mobility and knowledge circulation pattern that contradicts ERA policy objectives.
- From past experience, the following key lessons can be identified:
 - a. Sustained political ownership and continuous commitment at all levels (European, national and regional) are key to achieve the ERA and foster progress towards a fully functioning European area for research and, *mutatis mutandis*, for innovation, that

¹ https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/intm/134168.pdf

- acknowledges the value of diversity among MS/AC and their regions and raises scientific excellence across the whole of Europe;
- b. A renewed ERA needs to contribute more to a better quality of life for European citizens, driven by a new knowledge-based and innovation-led sustainable growth model, in line with wider economic, societal and environmental policy objectives, namely the transition to a healthy planet;
 - c. There is a need for a better acknowledgement of the shared competence and responsibility of R&I policies and of the multi-level reality in Europe. A renewed ERA needs to ensure relevance, impact and visibility across Europe, and this can possibly be achieved through tangible, larger and more impactful joint actions;
 - d. A renewed ERA should be based on an integrated, coherent approach between education, research and innovation policies and instruments in order to effectively achieve its wider objectives.
 - e. Education plays a key role for the future ERA and, thus, a special emphasis should be placed on a coordinated approach with the higher education sector, in particular the European Higher Education Area (EHEA) and ERASMUS+;
 - f. The design and implementation of a renewed ERA must be done in close interaction with all the relevant R&I stakeholders, as well as, whenever possible, the wider society, to provide a greater focus on outcomes and impacts to ensure that ERA delivers benefits for them all;
 - g. Existing barriers at national, including regional, and European level to a fully functioning ERA cannot be overcome by R&I policy alone. They need to be addressed by a broader set of horizontal and sectoral policies in a coherent whole-of-government approach;
 - h. There must be monitoring mechanisms in place from the start to assess progress, gaps, impacts and successes, to enable to steer the ERA and to allow it to adapt to evolving demands and needs.
6. A new ERA paradigm and narrative must build on all its many achievements since 2000, upgrade the future vision underpinning the ERA according to new forms of knowledge production and dissemination, to the changed environmental, economic and societal context and to the need for a knowledge-based and innovation-led sustainable growth model, and provide solutions to the societal challenges and to the identified shortcomings that have so far prevented the achievement of a fully-functioning ERA.

1.3 Recommendations

Building on the lessons learned and conclusions presented above, as well on the changed socio-economic environment and the need to better address future challenges in Europe and globally, the new ERA paradigm² and its underlying narrative should:

1. (OVERALL OBJECTIVE): Exploit the significant contribution that R&I plays in achieving Europe's wider policy goals and make ERA more responsive to society. Promote the adoption of ambitious knowledge policies, targeting researchers, innovators, R&I organisations and

² fully respecting subsidiarity and the scope of article 179 TFEU in a way that meets today's needs.

citizens, in order to broaden the outreach of ERA related initiatives while also improving communication activities.

2. (CORE VALUES): strengthen the focus on science, research and knowledge as core values of Europe. Define a set of core principles for ERA and promote them.
3. (SCOPE ON KNOWLEDGE): aim to realise the full potential of a knowledge-driven society, encompassing knowledge co-creation, dissemination and use/exploitation, as well as their interactions, based on effective open science approaches, turning this dynamic knowledge circle into the new metaphor for the future ERA.
4. (POLITICAL RESPONSIBILITY): be supported by a high level, strong and sustained political ownership and continued commitment at the EU and national, including regional, levels.
5. (STRATEGY FIRST): be focussed on strategic policy objectives and a broader/bolder policy vision/scope, while relevant governance aspects should be addressed at a later stage.
6. (INCLUSIVENESS): understand, respect and tap into the diversity of the national, including regional, research and innovation systems, to achieve a more synchronised co-evolution of R&I systems, to strengthen their quality and excellence, to reduce the existing inequalities and fragmentation and to foster connectivity, collaboration and complementarities, thus maximizing the effectiveness of the ERA at all levels.
7. (RECOGNITION): become more broadly recognised in order to allow education, research and innovation to better and more visibly contribute to wider EU policy objectives, including cohesion and societal objectives.
8. (EMPOWERMENT): mobilise and empower all national, including regional, R&I systems and their actors, to create, disseminate and exploit knowledge, fostering transnational and transregional cooperation through networks with adequate critical mass, framed within EU policies and programmes, notably the EU's R&I framework programmes, with the European Commission as a full and engaged partner.
9. (MULTILEVEL OWNERSHIP): trigger knowledge centered policies into a functional multi-level European R&I ecosystem that avoids unnecessary duplication, reduces fragmentation and ensures that policy-makers and stakeholders assume their responsibilities at all relevant levels.
10. (ENABLING): position research and innovation as an important horizontal enabler of solutions for societal needs/challenges and for improving the well-being of European citizens, as well as achieving a knowledge-based sustainable growth for improved European competitiveness on a global scale.
11. (FREE CIRCULATION): continue to improve the circulation of researchers, knowledge and technologies, while addressing the challenge of brain drain and unbalanced circulation patterns, as well as ensuring gender equality and access opportunities for all.
12. (REGULATORY MEASURES): be open for the potential need for a more complementary and coherent European approach to knowledge policy, namely potential soft law measures or possible legislative action at European level, including assessment and reform of national ERA related policies within the context of the European Semester.

The new ERA paradigm and its underlying narrative should also meet additional requirements stemming from the existing shortcomings and from a changed societal and economic environment in Europe and globally. Notably, the new ERA paradigm should:

13. (DIRECTIONALITY/RRRI): underline the importance of ambitious and sustained investments in R&I, possibly applying a ‘smart directionality’³ policy approach for knowledge production and exploitation, embracing societal goals/challenges and placing a bigger focus on the responsible use of knowledge and research results for societal purposes (policy-led Responsible R&I) in order to ensure the long-term sustainability of national, including regional, R&I systems.
14. (EHEA LINK): adopt more holistic and comprehensive policy approaches encompassing research, innovation and education (including training and skills development), in particular with respect to higher education (EHEA), where the ERASMUS+ program and the European Universities initiative, as well as EIT, could be building blocks.
15. (SUSTAINABILITY): underline that a fully functioning ERA will allow Europe to better address societal goals/challenges, in particular sustainable development and the Sustainable Development Goals (SDGs), without undermining the relevance of fundamental ‘blue sky’ research.
16. (EVIDENCE BASED POLICY MAKING): underline that Europe has among the highest quality of life standards in the World, which derives from the shared principle that scientific freedom and the exchange and use of knowledge are key for progress, and call for a new focus on the use of knowledge and scientific evidence in policy making, viewed as a differentiating feature of the European culture of policy making.
17. (SECTORAL POLICY IMPLEMENTATION): proactively support other sectoral policies, in order to facilitate their evidence-based development and monitoring, help assessing their expected impact and contribute to their implementation through testing and experimentation.
18. (OVERCOME BARRIERS): promote a dialogue and concerted actions with horizontal policies to overcome existing barriers to a fully-functioning ERA which are beyond the strict remits of R&I policy.
19. (GLOBAL DIMENSION): put a greater focus on promoting and enabling collaboration with all relevant third countries to find solutions to global challenges.

And, finally:

20. (ERA LIGHTHOUSES*): To provide visibility and demonstrate the implementation of these priorities as well as their impacts, ERA policy tools, such as ‘ERA lighthouses’, could be put in place. These tools should a) allow for concrete outcomes and impacts in the short- to medium-term based on concrete societal needs; b) address issues of European-wide relevance inside and beyond the R&I system; and c) lead to an improved acceptance, recognition and support for ERA by policy makers, ERA stakeholders and the wider society. ERA lighthouses should help to demonstrate in a tangible and concrete way the added value of the renewed ERA paradigm/narrative and its associated ERA objectives and priorities in practice.

The Commission is encouraged to take into account "ERA Lighthouses" with a view to preparations for the upcoming Commission communication on the future of the ERA, including the possibility to launch a pilot project on lighthouses.

³ The role of policy as setting the direction of change beneficial to society. Mazzucato, M. (2015b). From Market Fixing to Market-Creating: A New Framework for Economic Policy (No. 2015-25). SPRU-Science and Technology Policy Research, University of Sussex.

* Recommendation 20 is a conclusion from the ERAC plenary on 2 October 2019.

2. The Evolution of the ERA

The ERA concept took shape in 2000 with the Commission Communication “Towards a European Research Area”⁴ adopted by the European Council in Lisbon on 2000, with a view to overcoming fragmentation and isolation of national efforts and systems and reducing disparities of regulatory and administrative frameworks. It proposed seven dimensions with a corresponding list of possible themes for actions, including capacities: i) the European research infrastructures (ESFRI); ii) a European vision for the research careers; iii) a coherent use of public instruments, with the opening up and coordination of research programmes; iv) a dynamic private investment, including European Patent system and risk capital; v) a common system of references for better policymaking; vi) more human resources and research mobility; vii) and a dynamic European landscape building on shared values, including ethical issues. The sixth Framework Programme (2002-2008) strongly supported the development of the ERA with specific ERA instruments and dedicated horizontal schemes. However, according to the ex-post evaluation of FP6, the results were mixed⁵.

In April 2007, following a public consultation process, the green paper „The European Research Area: New Perspectives”⁶ was published and discussed in the course of the Portuguese Presidency. With the ERA seen as a cornerstone of the knowledge society where education and training, and research and innovation, were fully mobilised, and with a focus on catching up with the USA and the emergent powers of China and India, the ERA was redefined around six priorities (1) adequate number of researchers with mobility at all levels, 2) world class infrastructures; 3) excellent research institutions forming clusters and engaging in public-private partnerships; 4) effective knowledge sharing; 5) well-coordinated research programmes and priorities – joint programming; and 6) opening of the ERA to the World.

In 2008, under Slovenian Presidency, the Council of the European Union launched the 'Ljubljana process' in order to provide Europe with a common vision and effective governance, promoting the ERA as a partnership between the Member States and the Commission. The governance system linked the ERA to education, innovation and other relevant policies, it included both Member States and Associated Countries and stakeholders in the system and created the basis for a monitoring system. The 2020 Vision for the ERA was developed during the French Presidency, with a focus on promoting sustainable development, competitiveness and the satisfaction of citizens needs underpinned by the free circulation of knowledge and technology. Coordination and cooperation were based on a voluntary approach, with variable geometry, and due respect for the subsidiary principle. It envisioned that the ERA would contribute to the Knowledge triangle and highlighted the importance of intergovernmental programmes and of the EIT and its KICs. It was expected that the ERA would connect strongly with society and reap the full benefit from Europe’s diversity while finding the right balance between competition and cooperation.

⁴ Commission Communication “Towards a European Research Area” ([COM\(2000\)6](#))

⁵ https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/support-eu-research-and-innovation-policy-making/evaluation-impact-assessment-and-monitoring/past-framework-programmes_en#fp6

⁶ Council conclusions on the definition of a 2020 Vision for the European Research Area ([16767/08](#))

The ERA was enshrined in the Lisbon Treaty in 2009, making its implementation a “constitutional commitment” and the joint responsibility of the European Commission and the Member States. The Lisbon Treaty defines the mission of the ERA policy as follows (**Article 179 (1) TFEU**):

“The Union shall have the objective of strengthening its scientific and technological bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely, and encouraging it to become more competitive, including in its industry, while promoting all the research activities deemed necessary by virtue of other Chapters of the Treaties.”

The Treaty does not refer to the ERA as a goal to be achieved by a given date. Rather, the ERA is a basis towards continuous strengthening of the scientific and technological base in Europe.

The current ERA framework was put in place in 2012 with the Commission Communication “A reinforced European Research Area partnership for excellence and growth”⁷ following a public consultation process. It defined five ERA priorities focused on cross-cutting issues that mostly prevailed until today: (1) more effective national research systems, 2) optimal transnational cooperation and competition, 3) an open labour market for researchers, 4) gender equality and gender mainstreaming in research, 5) optimal circulation, access to and transfer of scientific knowledge and – at a later stage - 6) international cooperation. The Communication also specified concrete commitments linked to competitiveness and to maximizing excellence and the returns on public R&I investment. It kept the emphasis on the knowledge triangle and the interlinkages between R&I and other EU policies. It reinforced the merit-based recruitment to make research careers more attractive, it called for brain circulation and included the ERA in the national reform programmes and in the European Semester. The stakeholder organisations were integrated into the governance system of the ERA through the ERA Stakeholder Platform. International cooperation was incorporated as a sixth ERA priority by way of Council Conclusions shortly thereafter⁸.

In February 2011, the European Council called for the completion of the internal market as well as of the ERA by 2014, focusing on the circulation of knowledge and mobility and career prospects⁹. In this context, and to give more visibility to Member States’ actions in support of these ERA priorities and to strengthen the commitment to link European and national policies, the Council launched the ERA roadmap process in 2015¹⁰. The Council encouraged Member States and Associated Countries to draw up National ERA Action Plans and called on them to identify a limited number of top priorities that would have an impact at the EU level, taking into account national specificities. The plans would list on-going and planned national measures and activities in support of the six ERA priorities and provide information about their integration into the national research systems. Until the end of November 2019, 25 Member States and eight Associated Countries presented their national plans. The ERA

⁷ Commission Communication “A Reinforced European Research Area Partnership for Excellence and Growth” ([COM\(2012\) 392](#))

⁸ Council conclusions on “A Reinforced European Research Area Partnership for Excellence and Growth” ([17649/12](#))

⁹ The Council did a revision of ERA and asked the following on its paragraph 19: *Europe needs a unified research area to attract talent and investment. Remaining gaps must therefore be addressed rapidly and the European Research Area completed by 2014 to create a genuine single market for knowledge, research and innovation. In particular, efforts should be made to improve the mobility and career prospects of researchers, the mobility of graduate students and the attractiveness of Europe for foreign researchers. Furthermore, information about publicly financed R&D should be better disseminated, whilst respecting intellectual property rights, notably through the establishment of an inventory of EU-funded R&D, linked to similar inventories of R&D programmes funded at national level.*

¹⁰ Council conclusions on the European Research Area Roadmap 2015-2020 ([9351/15](#))

roadmap exercise contributed to ownership and responsibility of the Member States over the ERA, but, on the other hand, it slowed down, to a certain extent, the progress of ERA implementation at EU level.

The ERA policy framework has significantly enhanced collaboration, mobility and scientific excellence in Europe.¹¹ The EU framework programme for research and innovation was the main enabler for a more dynamic mobility of researchers and collaborations across borders. Bilateral and multilateral cooperation of national research funders, cofounded partnerships (notably ERA-NETs and EJPs) and JPIs¹² also contributed, to a certain extent, to align national research agendas to jointly address common challenges and priorities. The open science policies start to show some impact on the accessibility and sharing of knowledge. Important advances were achieved in various aspects related to research careers, including gender equality issues. The ERA has best demonstrated the efficiency gain of European collaboration through investing in shared research infrastructures under ESFRI.

Despite all the progress achieved after 20 years of ERA policy, and with a view to the next EU programming period starting in 2021, it is however time to take stock and strive for a new orientation. A critical assessment of the current ERA policy framework should feed into a new ERA paradigm. It should revitalize the common efforts for providing a strong base for excellent science in Europe. The need for a new ERA paradigm is recognised in the European Leader's Agenda 2019-2024 which underlines that *'we must step up investment in people's skills and education, do more to foster entrepreneurship and innovation and increase research efforts, in particular by addressing the fragmentation of European research, development and innovation'*. The next EU framework programme for research and innovation (Horizon Europe) will have to play an important role if the ERA policy objectives are to be achieved.

¹¹ See Annex 1 for a more elaborate assessment of the progress of the ERA policy framework.

¹² EJP: European Joint Programmes; JPI: Joint Programming Initiatives

3. Major achievements of the current ERA policy narrative

Since its inception in 2000, the ERA's achievements have been significant. The ERA has given an important impetus to strengthen the European dimension in national R&I systems, mainly through the national ERA action plans, while at the same time providing the legal base for many EU-level initiatives and interventions that would not have been possible without the ERA policy framework. A few of the most prominent ERA achievements are listed below. The extent of their success is a matter for debate, as some have fallen short of achieving their original objectives as well as their expected outcomes and impacts. Therefore, the following list should not necessarily be understood as an assessment of these initiatives by the Working Group:

- The European Research Council, launched under FP7 as a core pillar of the EU framework programme for research and innovation, achieves a clear EU added value despite being a largely mono-beneficiary programme because it clearly contributes to the ERA objectives at the level of the individual researcher;
- The forthcoming European innovation Council (EIC) under Horizon Europe is based on a similar legal and political rationale to the ERC, this time with a focus on innovative companies;
- The European Institute of Technology (EIT) and its thematic KICs have also been established on the basis of an ERA legal and political rationale and consequently funded through the EU FPs despite their legal base being Art. 173 of the TFEU;
- The ESFRI Roadmap facilitates and promotes European investment in World-class infrastructures, which complements the closer cooperation with the large European intergovernmental organisations. It was pivotal in the creation of Euroforum 2002, the association of the large intergovernmental organisations and infrastructures;
- The ERA-NET instrument, and its successors (ERA-NET+, EJP, CoFund,...), allowed networking of the funding organisations and thus promoted the coordination of national programmes in specific thematic areas. The diffusion of international peer-review and best practices in programme management, for the evaluation and selection of project winners, is one of its well-recognised achievements;
- Public-Public partnerships (art. 185 TEFU) and public-private partnerships (Art. 187 TEFU) have been implemented, some of them as the follow up to the roadmaps developed by European Technology Platforms or ERA-NETs. Joint Programming Initiatives have been set-up in a Member-States-driven policy approach to address the societal challenges in a joint manner.
- The European Open Science Cloud (EOSC) was set up as a trusted virtual environment for research and innovation in Europe to provide access to open data and related services. It promotes FAIR principles as an important element of Open Science and was implemented as a common initiative of European and national partners. Starting from 2020, all European researchers and research organisations should be able to deposit, access and analyse European scientific data through the EOSC;
- Human resources, the European dimension of research careers and mobility, have been a cornerstone of the ERA from the start and where enshrined as such by Art. 179 (1) TFEU. Fostered by EURAXESS, significant progress has been made in opening up the recruitment

process to non-nationals. The Principles for Innovative Doctoral Training¹³, approved by the Council for Education, and the Human Resources Strategy for Researchers (HRS4R)¹⁴, which, by way of the HR Excellence in Research Award¹⁵, helps to implement the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers, are important instruments to foster structural institutional change in higher education institutions, research and technology organisations, etc. However, partly due to issues outside the remit of research policy, such as social security and employment laws, there is clearly still room for further progress to achieve a truly effective, interconnected research career framework across sectors and countries;

- The ERA vision 2020 highlighted the need to consider that both women and men researchers should be attracted by the working conditions of European research institutions. In 2016, the Commission launched the Gender Equality in Academia and Research (GEAR) tool to provide guidance on how to develop Gender Equality Plans. The Commission's ERA-Communication 2012 encouraged MS to create a favourable legal and policy environment for removing gender barriers in research careers, addressing gender imbalances in decision making and strengthening the gender dimension in the content of research. Yet, recent figures underline that, to reach significant advances, there is a clear need for more disruptive policies across the whole ERA.
- Knowledge transfer is the second cornerstone of the ERA enshrined in Art. 179 (1) TFEU. The IP-charter was set up in 2008 by the Commission recommendation on the management of intellectual property in knowledge transfer activities and on a Code of Practice for universities and other public research organisations¹⁶. ERA guidelines for IP-Management with non-EU partners¹⁷ followed in 2012. Also, activities in other policy fields like the European Patents or the directive on public sector information¹⁸ improved the framework conditions for knowledge transfer.

¹³ Principles for Innovative Doctoral Training (IDTP, 27/06/2011) and Council conclusions on the modernisation of higher education

¹⁴ In November 2008, the Commission launched the Human Resources Strategy for Researchers implementing the Commission Recommendation 2005 of the European Charter for Researchers and the Code of Conduct for their Recruitment (<https://euraxess.ec.europa.eu/jobs/hrs4r>)

¹⁵ Human Resources Excellence in Research Award (<https://euraxess.ec.europa.eu/jobs/hrs4r>)

¹⁶ Council Resolution on the management of intellectual property in knowledge transfer activities and on a Code of Practice for universities and other public research organisations - C(2008)1329

¹⁷ ERA guidelines on IP management in international research agreements.pdf, ERAC KT WG, June 2012

¹⁸ Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information

4. Shortcomings of the current ERA policy narrative

The knowledge-related challenges are different today than a decade ago. Not only have the knowledge policies at national and European level evolved, but the societal environments in which the knowledge policies are embedded differ substantially. A good example is Open Science policies that benefitted significantly from digitalisation. Digitalisation has opened up new dimensions of transnational cooperation overcoming geographical distance and accelerating the speed of knowledge exchange.

Moreover, the global situation calls for faster policy responses to achieve a higher quality impacts from knowledge policies for the benefit of society and the economy. The current growth models are showing limited capacity to respond to the challenge of simultaneously advancing competitiveness, protecting against climate change, maintaining the European social model and the quality of life and achieving the strategic goals, such as the Sustainable Development Goals (SDGs). With knowledge and people as Europe's strategic resources and sources of competitive advantage, Europe can champion a new innovation-led sustainable growth model and lead in the development of new global standards. The new ERA paradigm needs to take the changed societal and environmental context and relevance of research for society into account.

The current ERA narrative, the foundation of the ERA policy framework, includes two main lines of argument. First, a 'single market for research' is a prerequisite to '*exploit the internal market potential to the full*' (TFEU) (strong competitiveness focus); and second, better coordinated national R&D policies (including 'opening-up' of national programmes) are a prerequisite for optimal transnational cooperation, in particular addressing the growing societal challenges. Both lines of argument continue to be relevant. However, they have reached their limits with respect to ensuring strong political ownership and commitment, despite the important achievements of the ERA was able to deliver during the last two decades (see highlights in chapter 3).

These shortcomings can be partly explained by a lack of recognition of the achievements of individual actors as most of these achievements have been linked to Framework Programmes successes or to national policies. In fact, one core challenge of a complex multi-level system like the ERA, which includes a broad range of actors and governance levels, is 'attribution' of successes. The contribution of one small part of a complex system to the overall success is barely recognised and valorised. A missing or reduced 'attribution' limits the ownership of actors in the complex multi-level system. It tends to be perceived as additional coordination burden. In relation to the ERA, this leads to the following implications:

- The actual and perceived contributions of effective ERA policies at EU, national and regional levels to competitiveness and 'welfare' (quality of life for EU citizens) cannot be attributed and consequently, additional coordination efforts are often seen as a burden and not as an asset. Empirical evidence suggests that this attribution challenge can eventually be overcome by demonstrating the added value through joint actions (see Section 6 on ERA Lighthouses).
- The application of the subsidiarity principle varies within the complex R&I system in Europe and is subject to a variety of related legal frameworks (from education and local social security systems to global trade policies) leading to widespread uncertainty at the different governance levels on how they relate to the overall ERA policy framework.

The ERA Progress report 2018 highlights that the ‘speed’ of policy reforms somewhat faltered since 2015, which can be an indication of decreasing political commitment at all levels to further accomplish the ERA and implement the Commission’s 2012 communication that shifted focus for development of ERA to the national level. Similar to the situation in the debate on the single market, it is fair to say that a lot has been achieved but that a renewed political engagement is necessary to achieve a fully functioning ERA. The recently adopted ‘leader’s strategic agenda for 2019-2024’ clearly identified this renewed challenge.

The slowing down of the implementation of the ERA at national level manifests itself in the continued fragmentation of the European R&I landscape. There are still major disparities among countries and regions in Europe as the ERA Progress Report 2018 and the European Innovation Scoreboard clearly demonstrate. The insufficient co-evolution across Europe has led to a geographical concentration of R&I pockets of excellence, leaving other regions behind. These divergences lead to unbalanced patterns of mobility in Europe that are incompatible with the goal of an inclusive and open ERA.

The ERA policy framework did not succeed in driving sectoral ministries towards a transdisciplinary R&I-driven ‘directed’ policy change on global challenges at EU and national level, such as climate, energy or agriculture and nor did it allow individual R&I actors to experience the benefits stemming from it. The ERA could yet enhance its interlinkage with the European Higher Education Area within the knowledge triangle. A close interlinkage among research and education policy is thus beneficial for both areas.

5. Lessons Learned

The future of the ERA builds on the lessons learned of the past twenty years of experiences with creating a competitive and integrated research area in Europe. The three main shortcomings, as outlined in the previous chapter, were the slowing down of implementation of the ERA due to a limited societal and political recognition and support for the ERA, a continued fragmentation of the EU research landscape and a lack of coordination with other policy areas. The lessons learned thus point towards the goal of creating a strong political commitment to the ERA, a successful coordination with other policy areas and an implementation of the ERA that is able to produce tangible benefits.

Firstly, a key learning from the past is that, to revitalize efforts for a fully functioning ERA at national and EU level, a **strong political commitment** is needed. Without political commitment, the necessary resources and ERA related reforms will not become a reality. A new ERA narrative should demonstrate the relevance of R&I for society and mobilize support at all levels and across policy areas. There is an urgency for action as research and innovation can and should be active drivers for transformational changes to achieve an innovation-led sustainable growth pattern and increase European solidarity and identity. The new ERA narrative should envision closer interactions with and responsiveness to society.

Secondly, the success of the ERA is dependent on the **inter-linkage with other policy areas**: foremost those of research-based knowledge policies but also beyond. Many ERA challenges are beyond the scope of R&I policies and hence require dialogue and concerted actions with other policies in a horizontal approach (e. g., higher education, innovation, cohesion, taxes, labour, pension systems, etc.). The new ERA should foster an integrated and coherent approach between higher education, research and innovation policies and instruments. A special focus will be on the relationship with the European Higher Education Area. Research performance and innovation have their roots in excellent education and, *vice-versa*, high-quality and interdisciplinary research and innovation should inspire innovative formats and quality of higher education.

Thirdly, the new political commitment and coordinated effort for a dynamic, integrated and competitive ERA should translate into an **accelerated implementation of the ERA policy objectives**. Optimal framework conditions and opportunities for research and innovation are at the core of the ERA. The challenges of the complex EU multi-level governance system can be overcome by a stronger emphasis on joint, coordinated ERA actions at national, including regional, and European levels and a reinforced partnership between the EU Commission and MS in the implementation of the new ERA. The joint action for the ERA should also involve R&I stakeholders and, where appropriate, the citizens. Finally, the implementation of the new ERA paradigm should be accompanied from the start by a monitoring mechanism to assess progress, gaps, impacts and successes. Monitoring will enable the European Council and the European Commission to steer the ERA and to adapt it to evolving demands and needs. The ERA lighthouses, that combine the involvement of stakeholders and political actors at all levels with a clearly defined goal, could be an opportunity for joint action and added visibility (see Chapter 6). The new dynamic of implementation will contribute to a coherent and inclusive ERA overcoming the current fragmentation.

The new ERA paradigm is thus to be inspired by the changed societal, technological and environmental context, as well as by the lessons learned from the political progress on the ERA since 2000.

6. Elements for the new ERA paradigm and narrative

As indicated in Article 179 (1) TFEU, the ERA is not a goal in itself but it should strengthen the scientific and technological base of Europe. The ERA is characterised by a free circulation of researchers, research-based knowledge and technology – a true internal market for researchers as knowledge producers and for research-based knowledge, namely to strengthen and circulate knowledge production, dissemination and usage.

The new ERA paradigm initiates the evolution to a more dynamic, more cohesive and more innovative future ERA. It reassesses the role of science for society and the goals of the ERA policy framework based on the lessons learned. Table 1 summarizes the ‘dimensions of change’ that should characterise the central pillars of the new ERA narrative.

Table 1: Dimensions of change between the ‘old’ and the ‘new’ ERA narratives

	Dimensions of change	From -> to dynamic (without questioning the continued relevance of the ‘from’ part of the sentence)
1	Overall Goal	<i>From</i> free circulation of researchers, knowledge and technology <i>to</i> a European community of knowledge producers and users
2	Policy approach	<i>From</i> overcoming barriers <i>to</i> seizing opportunities
3	Societal function of knowledge (encompassing education, science and innovation)	<i>From</i> valuing R&I’s service for society <i>to</i> valuing the contribution of research-based knowledge for the cohesion of the European society based on freedom of science principles
4	Relation to socio-economic objectives I	<i>From</i> global competitiveness <i>to</i> research-based knowledge-driven sustainable growth leadership
5	Relation to socio-economic objectives II	<i>From</i> addressing grand challenges <i>to</i> addressing transformative changes based on smart directionality
6	Relation to sectoral policies	<i>From</i> evidence-based policy-making <i>to</i> research-based knowledge-driven policy change
7	Level of activation	<i>From</i> innovation divide <i>to</i> an all-encompassing view of inclusiveness
8	Planning and implementation approach I	<i>From</i> individual knowledge dimensions <i>to</i> an integrated and dynamic knowledge circle
9	Planning and implementation approach II – role of the EU Commission	<i>From</i> a largely monitoring role of the European Commission <i>to</i> an European Commission as an active and engaged partner for delivering on the ERA across Europe
10	Interaction with other societal actors	<i>From</i> involvement of stakeholders in research-based knowledge policy design and implementation <i>to</i> broader societal engagement and responsiveness
11	Regulatory framework	<i>From</i> fully autonomous national frameworks for research-based knowledge policies <i>to</i> a truly multi-level steering framework

These eleven closely interlinked dimensions of change constitute the main new elements of the renewed ERA narrative. They can be summarised under five requirements, notably that ERA should:

- achieve a dynamic knowledge circle
- better demonstrate its societal relevance and be responsive to societal needs
- advocate a new R&I-driven sustainable growth and development model
- drive the co-design of R&I with relevant horizontal and sectoral policies
- harness the diversity of Europe’s R&I systems

These five new requirements will ultimately guide the identification of the revised ERA objectives and priorities (see deliverable 2). These five requirements reflect all the recommendations identified in chapter 1 of this document.

1) ERA must achieve a dynamic knowledge circle

The ever-moving knowledge circle (Fig. 1) is the symbol for the future ERA. It stands for the realisation of the full potential of knowledge and meeting the requirements of an internal ‘market’ of knowledge based on effective open science approaches as well of citizens’ demands for ever improving quality of life. The knowledge circle implies a more holistic federated approach to research, innovation and education, including training for skills and career development. Research policy should particularly link to the European Higher Education Area (EHEA) with Erasmus+, the European Universities initiative and the EIT as important building blocks.

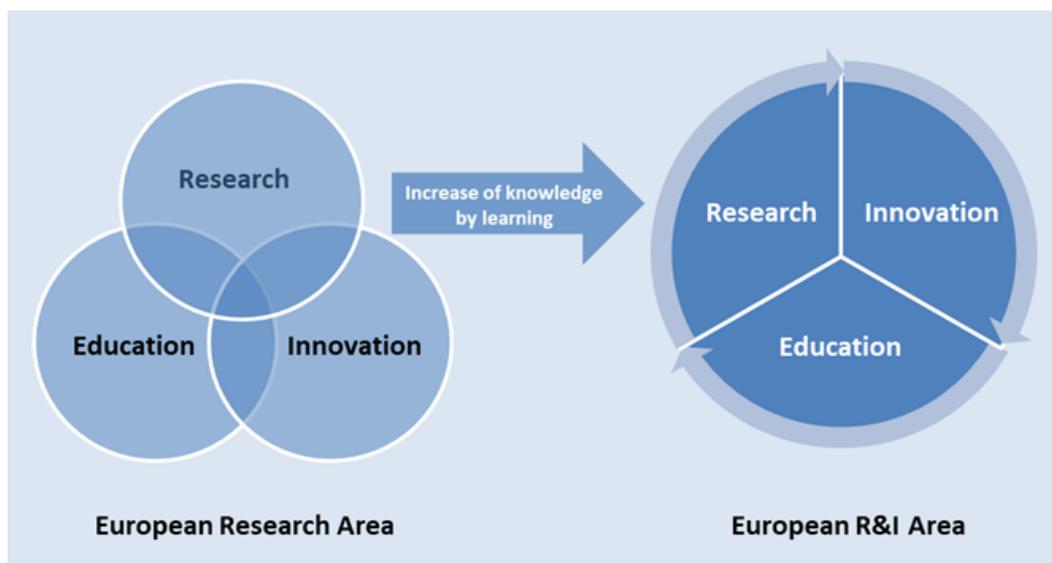


Figure 1: The evolution towards a dynamic knowledge circle

The knowledge circle embraces the multi-level reality of the European knowledge system and targets all activators and enablers at local, regional, national and European level that contribute to the steady movement of the knowledge circle, encompassing policy makers, the ‘traditional’ R&I actors in public and private research as well as the end-users and beneficiaries as well as citizens in society. This can only be achieved in close partnership between Member States and the Commission, overcoming the current division of labour between the EU Commission (mainly ERA monitoring) and Member States (implementation of ERA policy reforms).

2) ERA must better demonstrate its societal relevance and be responsive to societal needs

The recognition of knowledge as a pivotal component of the European social and economic structure should be reinforced, in particular its link to a European identity and democratic values. In the ERA, excellent research is transformed into globally competitive and sustainable products and services. Research-based knowledge is key enabler of Europe's economic prosperity and the high standard of living of its citizens. The high value of the common principle of scientific freedom demonstrates the valorisation of knowledge in the ERA. The cultural relevance of research manifests itself in scientific evidence-based policy-making as an important contribution to Europe's cohesion.

Knowledge production should be based on strong and clear ethical standards, which can help address global societal challenges. The ERA should define and promote the core principles for knowledge production, dissemination and use.

An ambitious but flexible set of ERA policies, actions and governance mechanisms is needed to address the multi-level and multi-actor reality of Europe, including researchers and citizens. Societal and political recognition and support for the ERA will depend on the extent to which societal needs are drivers for ERA priority setting and implementation. The interaction with society at all levels of the knowledge policy cycle, from designing to monitoring and implementing, is key to ensuring the continued responsiveness to and relevance for societal needs.

3) ERA must advocate a new R&I-driven sustainable growth and development model

The contribution of research-based knowledge and innovation to productivity, growth and jobs creation must become more visible. The ERA should increase the impact of R&I investment, notably through 'smart directionality' for knowledge production, dissemination and use. 'Smart directionality' intends to provide direction for sectoral policy making and to steer the research agenda towards the knowledge demands of society. R&I are at the core of delivering outputs for reaching the goals of the Sustainable Development agenda. The SDGs can act as an ethical foundation as well as a driver for priority setting beyond blue-sky research. Fundamental research, protected by the core value of scientific freedom, must remain the core element of the ERA.

The ERA should integrate the evolution of national and EU level knowledge creation policies, in particular by establishing a more 'modern' and thus systemic approach towards a knowledge ecosystem, encompassing research, innovation and (higher) education, including training and skills development. A closer interaction with other policy areas enhances ERA's contribution to the wider EU policy objectives and, thereby, its visibility.

4) ERA must drive the co-design of R&I with relevant horizontal and sectoral policies

The ERA should drive sectoral ministries towards a transdisciplinary R&I-driven 'directed' policy change on global challenges policies at EU and national level, such as climate, energy, agriculture, etc. The implementation and uptake of knowledge for sectoral policy-making should be strengthened. The new ERA should champion an effective policy and governance interface for a bottom-up approach, in which the research and innovation landscape has a recognised role in the implementation of sectoral policies. In the same vein, ERA must continuously encourage efforts at all levels to increase the overall excellence and quality of the knowledge policy systems in Europe, in close cooperation with horizontal policies such as employment, social, pension and finance policies. The new ERA should focus more on seizing opportunities for joint actions between knowledge policies and other policy areas in order to demonstrate tangible impacts and benefits for society.

In recent years, efforts for this have been intensified on the EU level via the European Semester, which in 2019 for the first time included a recommendation that all MS need to increase their investments in R&I and call for policy reform to enhance the quality and efficiency of national R&I systems (smarter investments in research and innovation). The new ERA paradigm should increase the awareness of sectoral policies for exploiting research and innovation results in their design and engaging with actors in this field. For the achievement of a more complementary and coherent European approach to knowledge policy, it might become necessary, in full respect of the subsidiarity principle, to reflect about necessary initiatives, including potential soft law measures or possible legislative action at European level, to achieve a truly multi-level, effective steering framework.

5) ERA must harness the diversity of Europe's R&I systems

In the past, the ERA contributed substantially to a common understanding of 'knowledge policies' (notably R&I policies). However, it has become obvious that this common understanding does not sufficiently harness the diversity among the Member States R&I systems, in particular the necessary translation and adaptation of ERA policies to local and/or regional demands. The ERA needs to become more 'tailor-made' in order to be able to ensure relevance at local and regional level and overcome existing inequalities across Europe. ERA initiatives should respect and harness the diversity of EU Member States (and Associated Countries) and regions. A healthy balance between competition and collaboration should ensure that different strengths of regions complement each other. In view of the diverse starting points across countries, the ERA can only be successful if it is fully inclusive and provides added value to the whole of Europe and triggers a synchronised co-evolution across the whole continent. An encompassing view of "inclusiveness" and "diversity" is required, covering geographic, human capital, gender and minority groups-related issues, as well as both public and private institutions of all sectors.

While the freedom of movement, including researchers, is a fundamental achievement of the EU, more emphasis is needed to ensure an appropriate brain circulation at all levels while reducing the undesirable phenomena of "brain drain".

7. ERA ‘lighthouses’ to bring ERA to life

The new ERA paradigm calls for more concrete and tangible ERA related actions and impacts in order to increase ownership of the ERA by policy makers, ERA stakeholders and the broader society. While the ERA national action plans (NAPs) underline the manifold activities that are going on at the national level, there is still a widespread perception that societal and political recognition of the value of ERA as an enabler of Europe’s future remains underdeveloped. One possible approach to ensure and demonstrate more concrete and tangible ERA actions and impacts with higher visibility is the establishment of rather narrowly defined initiatives as ‘ERA policy tools’ that:

- allow for concrete outcomes and impacts in the short- to medium-term based on concrete societal needs, including from within the R&I system
- address issues of European-wide relevance inside and beyond the R&I system for which a significant number of existing initiatives at regional, national and European level are on-going
- lead to an improved acceptance, recognition and support for ERA by policy makers, ERA stakeholders and the wider society

So far, the term ‘ERA lighthouses’ has been used to describe such potential ERA initiatives/policy tools. ‘Lighthouses’ refer here to the visibility function of lighthouses, as a ‘light in the dark’.

Consequently, the problems that ERA lighthouses should address are three-fold. First, ERA lighthouses must show that R&I driven transformative changes contribute to the well-being of European citizens – thus they must be developed and implemented in close interaction with societal actors and be based on societal needs, including from within the R&I system. Second, ERA lighthouses must demonstrate the power/added value of collaboration across Europe to provide more and better transformative changes – thus they should be designed and implemented with a European-wide perspective in variable geometry and largely build on existing initiatives at regional, national and European level within and beyond the R&I system that lack a European-wide connection. Third, the ERA lighthouses must acknowledge the diversity of ERA – thus they should start small and expand gradually in order to keep complexity and transaction costs reasonable.

OBJECTIVES

The general objective for ERA lighthouses is the following:

ERA lighthouses should improve substantially acceptance, recognition and support for ERA by policy makers, ERA stakeholders and the wider society by demonstrating in a tangible and concrete way the added value of the new ERA paradigm/narrative and its associated ERA objectives and priorities in practice.

From this general objective, the following specific objectives can be derived:

1. Demonstrate societal benefits of R&I driven transformative changes, being them technological, political, economic, environmental or social changes;
2. Highlight the power/added value of European-wide collaboration within and beyond the R&I system for providing better transformative changes for the benefits of EU citizens;
3. Identify opportunities for new ways of European-wide collaboration in the ERA with diversity of regional/national R&I systems as an asset [and not a barrier].