

ESFRI

European Strategy Forum
on Research Infrastructures



Research Infrastructures in Horizon 2020 and ESFRI Roadmap

Information Day on Research Infrastructures

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Unit "Research Infrastructures"






European
Commission



Research Infrastructures are facilities, resources and related services, where **basic research** as well as **applied research** are interacting to generate innovations for our daily life

This includes:

- major scientific equipment (or sets of instruments);
 - knowledge-based resources such as collections, archives or scientific data;
 - e-infrastructure, such as data, computing and software systems;
 - any other infrastructure of a unique nature essential to achieve excellence in research and innovation
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RIs at the core of an efficient Research & Innovation Strategy

- ❑ RIs designed and operated to attract / host best researchers in the world (open access) play important roles in the advancement of knowledge and technology
- ❑ To respond to challenges they need innovation and world-level quality in all aspects of their activities: scientific, educational, technological and managerial
- ❑ This liberates the creative potential of the staff, the users and the providers, from scientists to industries and thus becomes a crucial socio-economic and innovation driver

RIs are the backbone in the construction of the European Research Area (ERA).



**Innovation
Union
EU 2020**



**Regional
Policy in
EU 2020**

Development of World-Class RIs & RPFs

- ❖ Develop world-class research and **ICT** infrastructures building on existing regional scientific excellence through Structural Funds support
- ❖ Develop Regional Partner Facilities (RPF)
- ❖ Increased investments in research infrastructures, including those of ESFRI roadmap, by achieving synergies between Horizon 2020 and the Structural Funds
- ❖ **“By 2015, the Member States together with the Commission should have completed or launched the construction of 60% of the ESFRI projects”**

[Europe 2020 Flagship Initiative-Innovation Union, COM(2010)]



Why an EU Approach for Research Infrastructures?

- To **open access** to the research infrastructures existing in the individual Member State to all European researchers
- To **avoid duplication of efforts** and to coordinate and **rationalise the use** of these research infrastructures
- To trigger the **exchange of best practice**, develop **interoperability** of facilities and resources, develop the **training** of the next generation of researchers
- To connect national research communities and **increase the overall quality of the research and innovation**
- To help **pooling resources** so that the Union can also acquire and operate research infrastructures **globally**



Horizon 2020

Excellent science

- European Research Council
- Future and Emerging Technologies
- Marie Curie actions
- **Research infrastructures (including e-infrastructures)**

Societal challenges

- Health, demographic change and wellbeing
- Food security, sustainable agriculture, marine -maritime research, bio-economy
- Secure, clean and efficient energy
- Smart, green, integrated transport
- Climate action, resource efficiency, raw materials
- Inclusive, innovative and secure societies

EIT

Research & Innovation

Industrial leadership

- Leadership in enabling and industrial technologies (ICT, space, nanotechnologies, advanced materials and advanced manufacturing and processing, biotechnology)
- Access to risk finance
- Innovation in SMEs

JRC (non-nuclear)



In complementarity with the
REGIO actions
(Structural & Social Funds)

Research Infrastructures under H2020

4.1. Developing the European RIs for 2020 and beyond

- 4.1.1 *Developing new world-class RIs*
- 4.1.2 *Integrating and opening national RIs of pan-European interest*
- 4.1.3 *Development, deployment and operation of ICT based e-Infrastructures*

Main actions

4.2. Fostering the innovation potential of RIs & their human capital

Specific actions

4.3. Reinforcing European RI policy and international cooperation

Policy actions



1.1 Developing new world-class RIs

- Objective: *To ensure the implementation, long-term sustainability and operation of the ESFRI and other world-class RIs*
- EU funding will support:
 - ✓ the **preparatory phase** of future RIs (e.g. detailed construction plans, legal arrangements, multiannual planning, etc.)
 - ✓ the **implementation phase** (e.g. R&D and engineering work, etc.)
 - ✓ development of **Regional Partner Facilities** in synergy with DG REGIO actions (structural funds and social funds)
 - ✓ the **operation phase** (e.g. access, data handling, outreach, training and international cooperation activities)
 - ✓ **design studies** for new RIs through a bottom-up approach



1.2 Integrating and opening existing national RIs of pan-European interest

- Objective: *The aim is to **open up key national RIs** to all European researchers and to ensure their **optimal use** and **joint development***
- EU funding will support “**European Research Infrastructures Networks**” bringing together RIs in a given field covering:
 - ✓ ***Transnational** and **virtual access** activities*
 - ✓ ***Networking** activities to foster a culture of cooperation*
 - ✓ ***Joint research** activities to **improve the services** provided by the infrastructures*



1.3 Development, deployment and operation of ICT based e-Infrastructures

Objective: *To achieve by 2020 a single and **open European space** for online research*

- EU funding will support :
 - ✓ *Global research and education networks*
 - ✓ *Grid and cloud infrastructures*
 - ✓ *Ecosystem of supercomputing facilities progressing towards exa-scale*
 - ✓ *Software and service infrastructure for visualisation and simulation*
 - ✓ *Real-time collaborative tools for virtual research communities*
 - ✓ *Interoperable, open and rich scientific data infrastructure*



2. Fostering the innovation potential of RIs and their human capital

2.1 Exploiting the innovation potential of RIs

- *To stimulate **innovation** both in the RIs themselves and in their supplier and user industries:*
 - ✓ R&D partnerships with industries to develop Union capacities in high-tech areas such as scientific instrumentation
 - ✓ pre-commercial procurement by RI actors
 - ✓ stimulate the use of RIs by industry
 - ✓ Encourage the integration of RIs into local, regional and global innovation ecosystems

2.2 Strengthening the human capital of RIs

- *To develop adequate skills for the managers, engineers and technicians, as well as users*
 - ✓ Support for the training of staff managing and operating RIs, exchanges of staff
 - ✓ Exchanging of best practices between facilities



3. Reinforcing European RI policy and international cooperation

3.1 Reinforcing European policy for RIs

- *To exploit synergies between national and Union activities:*
 - ✓ Partnerships between relevant policymakers and funding bodies
 - ✓ Supporting synergies with other policies (e.g. REGIO, EMPL)
 - ✓ Surveys, monitoring and assessments of RIs at Union level
 - ✓ Policy studies and communication tasks

3.2 Facilitate strategic international cooperation

- *To facilitate the development of global RIs*
 - ✓ Cooperation of European RIs with their non-European counterparts:
 - ✓ Ensuring their global interoperability and reach
 - ✓ Pursuing international agreements on the reciprocal use, openness or co-financing of RIs



From FP7 to Horizon 2020

- An **increased budget**, from around €1.7 billion (FP7) to €2.5 billion (Horizon 2020 – 2011 constant prices)
- New activities to support the **implementation** and **operation** of world-class research infrastructures such as **ESFRI** infrastructures
- **Continuation** of the successful FP7 **Integrating Activities**
- **Reinforcement** of the support to **e-infrastructures**
- New objective of better exploiting the **innovation potential** and **human capital** of infrastructures



Next steps for Horizon 2020

- On-going** Parliament and Council negotiations on the basis of the Commission proposals
- On-going** Parliament and Council negotiations on EU budget 2014-2020 (including overall budget for Horizon 2020)
- Mid 2013** Adoption of legislative acts by Parliament and Council on Horizon 2020
- 1/1/2014** Horizon 2020 starts, launch of first calls



ESFRI

European Strategy Forum on Research Infrastructures

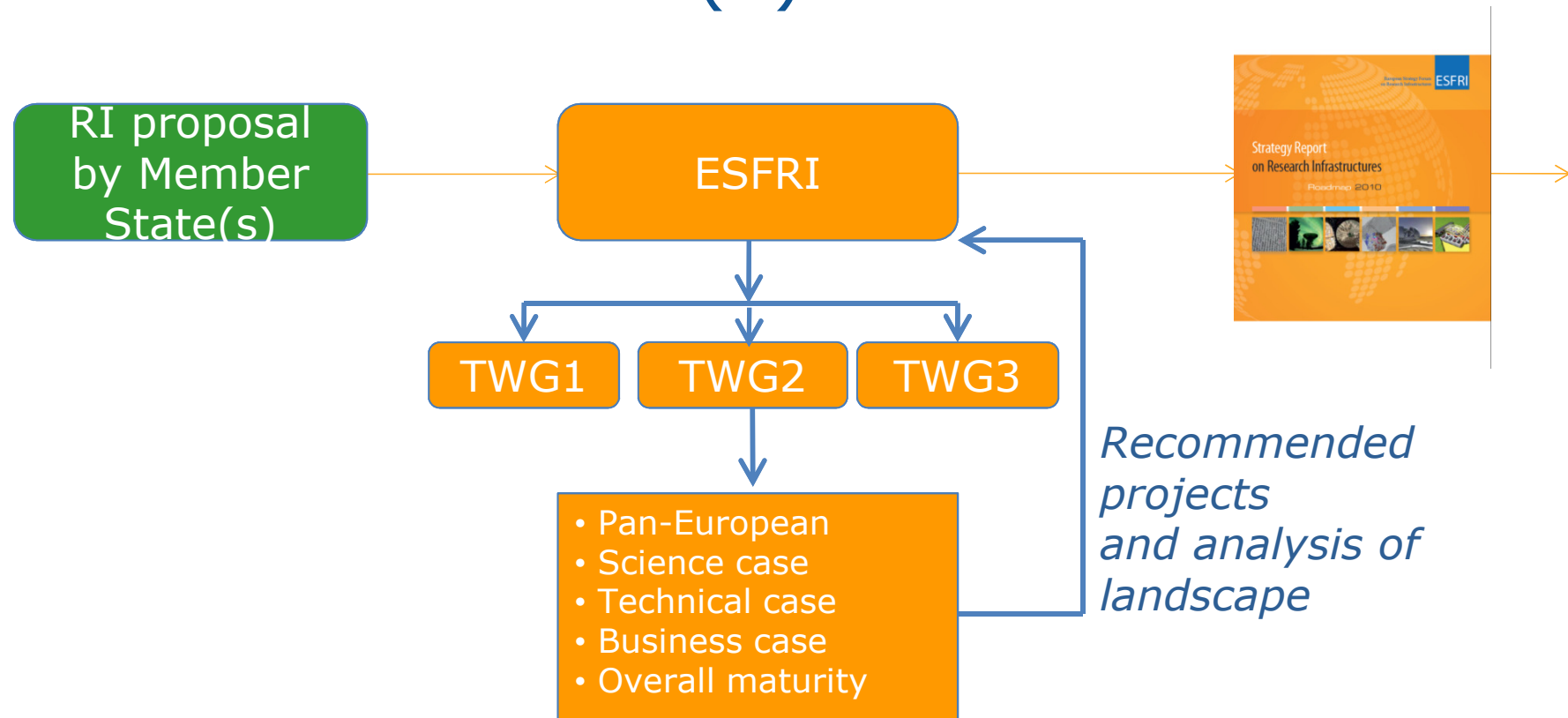
- Set up by the EU Council of Research Ministers in 2002
- Brings together representatives of Ministers of the 27 Member States, 10 Associated States, and of the European Commission
- Supports a coherent and strategy-led approach to policy making on Research Infrastructures
- Mandate to develop a Roadmap (2006) and its updates (2008, 2010)

ESFRI – The Roadmap

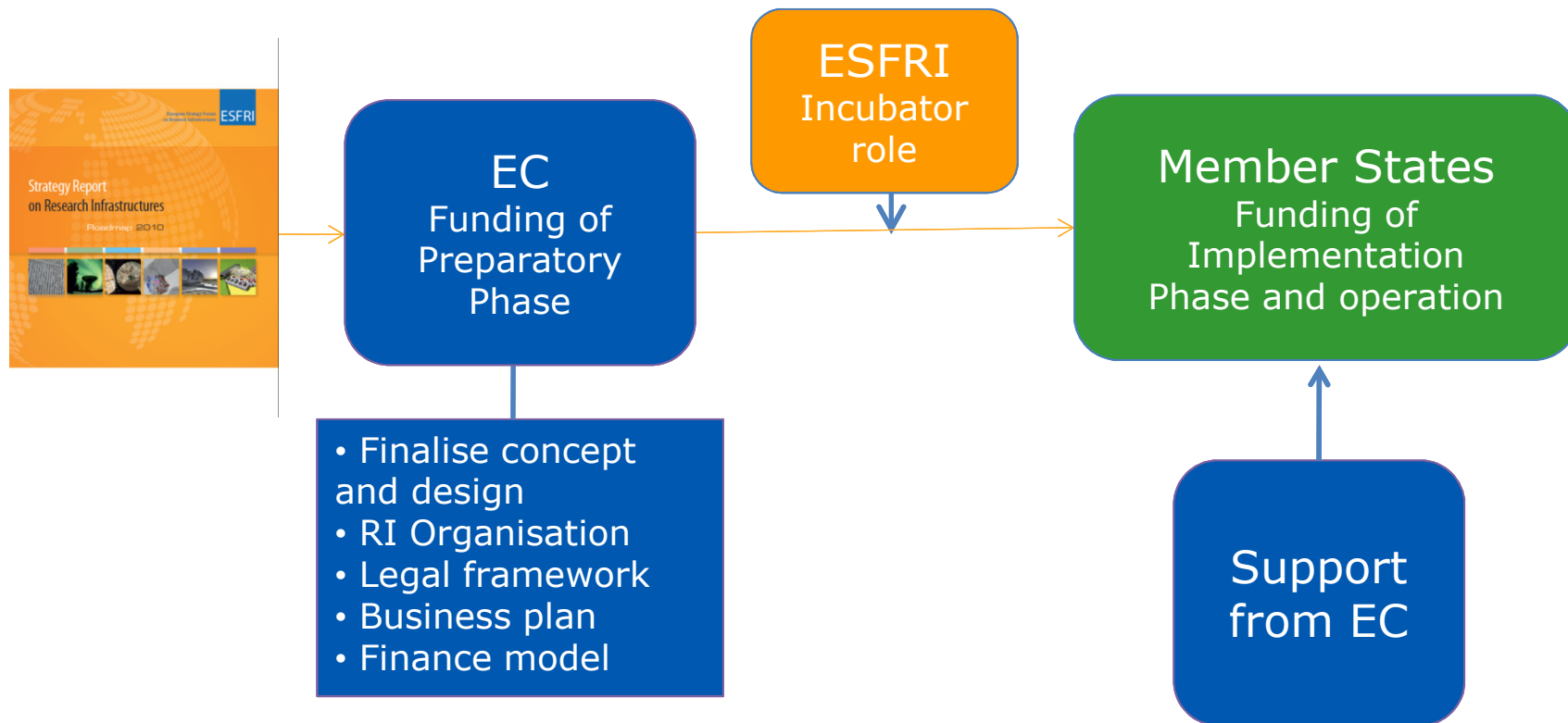


- The ESFRI roadmap identifies new pan-European Research Infrastructures or major up-upgrades to existing ones, corresponding to the needs of European research communities in the next 10 to 20 years, in all fields of Sciences and Technologies, regardless of possible location
- First Roadmap published in 2006
- Followed by two updates in 2008 and 2010:
 - Now contains 48 projects
 - Requiring major financial investment (~20 b€) and long term commitment for operation (~2 b€/year)

The ESFRI Process (1)




The ESFRI Process (2)




ESFRI Roadmap 2010


Social Sc. & Hum. (5)	Life Sciences (13)		Environmental Sciences (9)		Energy (7)	Material and Analytical Facilities (6)	Physics and Astronomy (10)		e-Infrastructures (1)
SHARE	BBMRI	ELIXIR	ICOS	EURO-ARGO	ECCSEL	EUROFEL	ELI	TIARA	PRACE
European Social Survey	ECRIN	INFRA FRONTIER	LIFEWATCH	IAGOS	Windscanner	EMFL	SPIRAL2	CTA	
CESSDA	INSTRUCT	EATRIS	EMSO	EPOS	EU-SOLARIS	European XFEL	E-ELT	SKA	
CLARIN	EU-OPENSREEN	EMBRC	SIAEOS	EISCAT_3D	JHR	ESRF Upgrade	KM3NeT	FAIR	
DARIAH	Euro BioImaging	ERINHA BSL4 Lab		COPAL	IFMIF	NEUTRON ESS	SLHC-PP	ILC-HIGRADE	
	ISBE	MIRRI			HiPER	ILL20/20 Upgrade			
	ANAEE				MYRRHA				




Greek Participation and funding commitments



Distributed research infrastructures

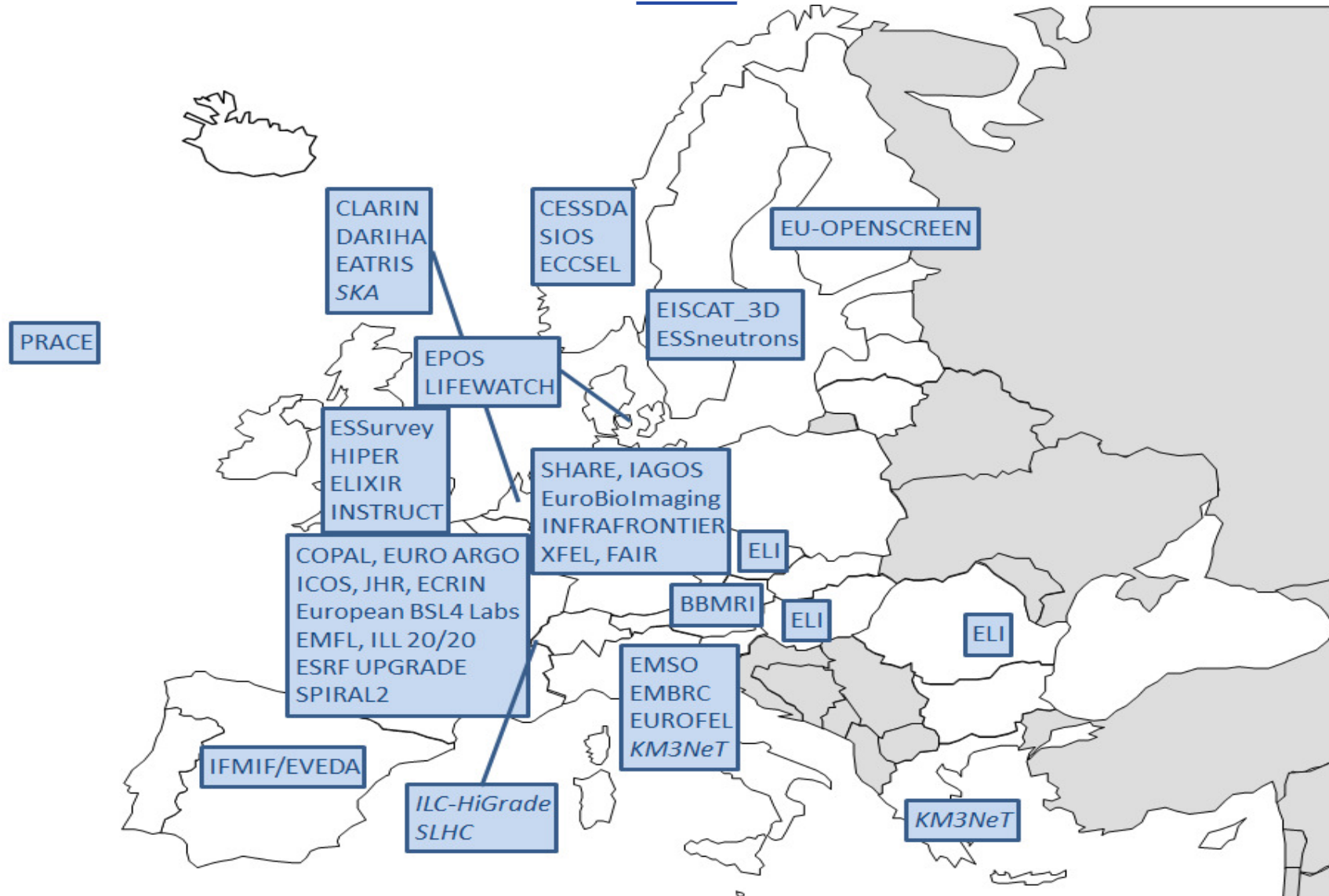


Single sited research infrastructures



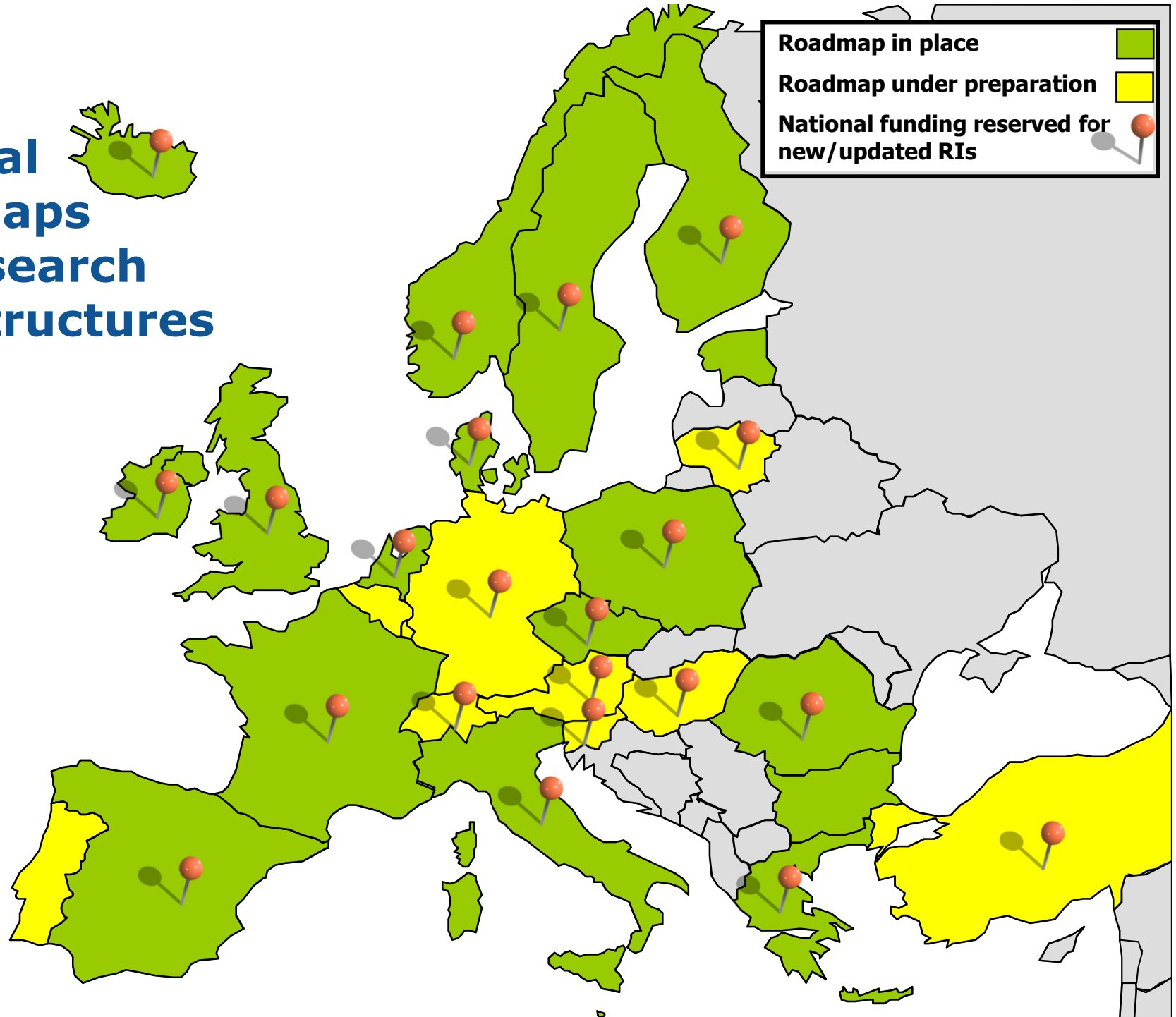


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Research & Innovation

National Roadmaps for Research Infrastructures





Projects expected to be implemented by 2013

- **Social Sciences and Humanities:** *CLARIN, DARIAH*
- **Environmental Sciences:** *EISCAT, EURO ARGO, IAGOS, ICOS, LIFEWATCH*
- **Health & Food:** *BBMRI, EATRIS, ECRIN, ELIXIR, INFRAFRONTIER, INSTRUCT*
- **Material Sciences:** *European Spallation Source*
- **Physical Sciences:** *E-ELT, ELI*

Projects officially under implementation (Roadmap 2010):

CESSDA, ESRF Upgrade, European Social Survey, SHARE, XFEL, ILL 20/20, FAIR, SPIRAL2, PRACE, JHR



Implementation of ESFRI projects

«A combination of resources from national budgets, Community programmes, EIB instruments and structural funds should lead to the development of excellent research infrastructures throughout Europe»

*EU Council of Research Ministers
March 2009*

New mandate to ESFRI for implementation of ESFRI projects

“EMPHASISES the need for renewing and adapting the mandate of ESFRI to adequately address the existing challenges and also to ensure the follow-up of **implementation** of already on-going ESFRI projects after a comprehensive assessment, as well as the **prioritisation** of the infrastructure projects listed in the ESFRI roadmap”.

*EU Council of Research Ministers
December 2012*

Current ESFRI Working Groups

- **Strategy Working Groups:**
 - *Energy*
 - *Social & Cultural Innovation*
 - *Environment and Climate change*
 - *Health & Food*
 - *Physics & Engineering*
- **Implementation Working Group**
- **Regional Issues Working Group**
- **Innovation Working Group**
- **Ad-hoc Expert Group on indicators**



Recommendations by IG

- Roadmap projects should involve all stakeholders (MS, AC, non-EU countries) from an early stage .
- MS/ACs should examine how they can better fit ESFRI projects into their national roadmaps
- Projects and Member States should explore the use of structural funds to finance national nodes of distributed pan-European RIs.
- ESFRI should politically support the roadmap projects by raising awareness among the Member States.



Regional Partner Facility

"A RPF to a Research Infrastructure of pan-European interest must itself be a facility of national or regional importance in terms of socio-economic returns, training and attracting researchers and technicians. The quality of the facility including the level of its scientific service, management and open access policy must meet the same standards required for pan-European Research Infrastructures. The recognition as an RPF should be under the responsibility of the pan-European single sited or distributed ESFRI Research Infrastructure itself, based on regular peer-review".

- ❑ ***The RPFs contribute to a more balanced development of the European Research Area, and to the "circulation of knowledge" throughout Europe***
- ❑ ***Building up the regional RI capacity by using the Structural Funds***



Next steps

- **The EC has set up an Expert Group on Assessment of the ESFRI projects.**
- **The members of the Expert Group are high level managers expert in setting up and managing RIs**
- **This group will assess the financial and managerial maturity of the projects of the ESFRI roadmap.**
- **Strategy WGs monitor and report on the scientific development of projects**
- **The IG will work together with the this Expert Group and the Strategy Working Groups to assist the implementation of the projects.**

Planned investment 2007-2013



European Regional Development Fund and Cohesion Fund (ERDF) (€ 271 billion)



Research/Innovation
86 billion EUR – 25%
of the total Structural
Funds allocation
(€ 346 billion)

of which circa 61 billion
EUR for the less
developed regions

- Information society
- Tourism
- Social infrastructure
- Culture
- Energy
- Institutional capacity



Objectives of cohesion policy 2014-2020

- **Deliver the Europe 2020 strategy objectives of smart, sustainable and inclusive growth**
- **Focus on results**
- **Maximise the impact of EU funding through concentration**
- **Conditionalities (smart specialisation)**



Thematic objectives

Europa 2020

smart

sustainable

inclusive

1. **Research and innovation**
2. Information and Communication Technologies
3. Competitiveness of Small and Medium-Sized Enterprises (SME)
4. Shift to a low-carbon economy
5. Climate change adaptation and risk management and prevention
6. Environmental protection and resource efficiency
7. Sustainable transport and disposal of congestion on major network infrastructure
8. Employment and support for labour mobility
9. Social inclusion and poverty reduction
10. Education, skills and lifelong learning
11. Increased institutional capacity and effectiveness of public administration



Thematic ex-ante conditionalities

... state-of-play regarding RIS3 conditionality...

Thematic objectives	<u>Ex ante</u> conditionality	Criteria for fulfilment
<p>1. Strengthening research, technological development and innovation (R&D target) (referred to in Article 9(1))</p>	<p>1.1. Research and innovation:</p> <p>The existence of a national or regional research and innovation <i>strategic policy framework</i> for smart specialisation in line with the National Reform Programme, to leverage private research and innovation expenditure.</p> <p>For research infrastructures only:</p> <p>1.2 The existence of a multi-annual plan for budgeting and prioritization of investments.</p>	<p>A national or regional research and innovation strategic policy framework is in place that:</p> <ul style="list-style-type: none"> – is based on a SWOT analysis to concentrate resources on a limited set of research and innovation priorities; – outlines measures to stimulate private RTD investment; – contains a monitoring mechanism. <p>An indicative multi-annual plan for budgeting and prioritization of investments linked to EU priorities and, where appropriate, the European Strategy Forum on Research Infrastructures – ESFRI has been adopted</p>



Important novelties for R&I in proposed Regulations (1)

- **SMEs only! Large Firms only in connection with R&TD+I. Art.3 (ERDF Reg.):** *"The ERDF shall support productive investment, which contributes to creating and safeguarding sustainable jobs, through direct aid to investment in SMEs"*
- **No physical infrastructures in rich regions (except R&I): Art. 3 (ERDF Reg.):** *"In more developed regions, the ERDF shall not support investments in infrastructure providing basic services to citizens in the areas of environment, transport, and **Next Generation Access (NGA)/ICT**".*

Attention: under discussion in Council

Important novelties for R&I in proposed Regulations (2)

- **Common Provision Regulation**
- **Promoting internationalisation: Art. 60.2 (b):** if the operation is for the benefit of the programme area: "*The total amount allocated under the programme to operations located outside the programme area [but within the Union] does not exceed 10% of the support from the ERDF, CF and EMFF (3% for EAFRD)*"
- **...and interregional collaboration: Art. 87.2 (c) v:** "An Operational Programme shall set out the contribution to the integrated approach for territorial development set out in the Partnership Contract (Agreement), including the arrangements for interregional and transnational actions with beneficiaries located in at least one other Member State"



Important novelties for R&I in proposed Regulations (3)

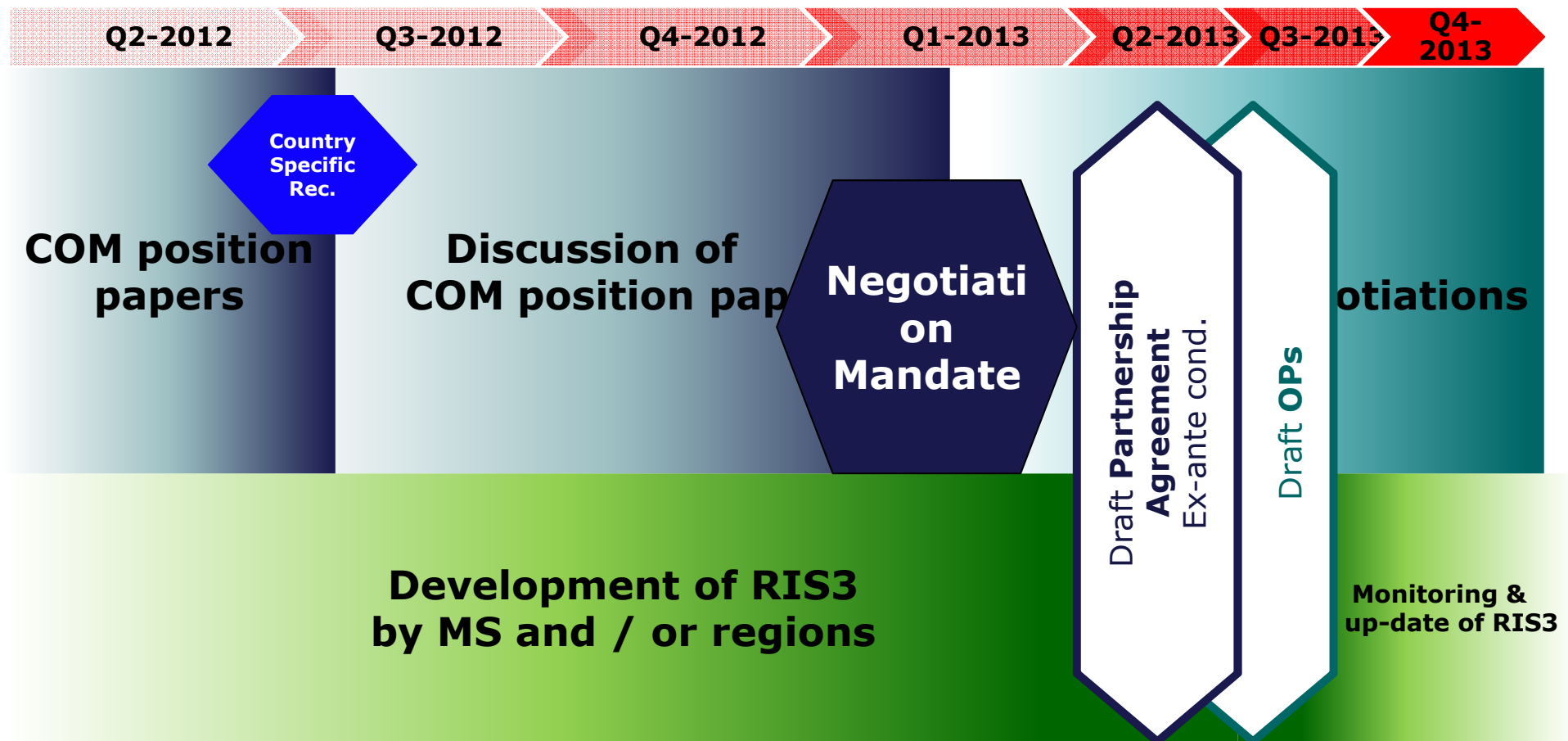
- **Open to synergies with Horizon 2020: Common Provision Reg and revised version**
- *Art. 55.8: "An operation may receive support from one or more CSF Funds and from other Union instruments, provided that the expenditure item included in a request for payment for reimbursement by one of the CSF Funds does not receive support from another Fund or Union instrument,..."*
- *ANNEX I Common Strategic Framework elements related to the coherence and consistency with the economic policies of Member States and the Union (...) In section 4.3 - Horizon 2020 and other centrally managed EU programmes in the areas of research and innovation*
- *RIS3 and R&I infrastructures of common interest: joint financing....*



Specific issues related to research infrastructures

- **At policy level:** The objective of Regional policy is to improve the **regional economy** in terms of competitiveness, growth and jobs. Therefore, it can only support research infrastructure (RIs) contributing to this objective. It cannot support RIs for "purely" scientific purposes.
- **At strategic level:** the authorities establishing National Roadmaps linked to the **ESFRI Roadmap** should work together with the authorities involved in designing and delivering **RIS3**, in particular for facilitating access to industrial users and in the context of industrial clusters.
- **At project level:** for using ERDF (EU Regional fund), project managers have to contact the ERDF Managing Authorities to explain the impact of the RI on the regional economy (links with innovative industries, spin-offs, etc). Possible funding will depend on the regional priorities, budget planning, timing and procedures (see ERDF website).
- **About operational costs:** only operational costs included in a project supported by ERDF are eligible to ERDF. It includes the part of overheads linked to this project.

Timing for RIS3 and Operational Programmes





Role of National / Regional Authorities implementing the different EU policies

- ❑ **Exploiting the potential for synergies**
- ❑ **Strategic & operational coordination** *based on RIS³ and on establishing and exchanging lists of projects for identifying and promoting synergies between complementary projects, through joint meetings between authorities and/or agencies involved in H2020 and Cohesion policy*
- ❑ **Perform a serious analysis of national, regional and local characteristics and priorities**
- ❑ **Formulate a clear plan with limited and specific priorities, where an evaluation process has to be built-in, with relevant indicators**

WHAT YOU NEED TO KNOW IF INTERESTED IN FUNDING FROM COHESION POLICY

FIND OUT WHO IS THE MANAGING AUTHORITY FOR STRUCTURAL FUNDS IN YOUR COUNTRY / REGION

They are responsible for managing the money of the SF and know the eligibility rules etc...

FIND OUT WHO IS RESPONSIBLE FOR PREPARING THE OPERATIONAL PROGRAMMES AND SF PARTNERSHIP AGREEMENTS IN YOUR COUNTRY / REGION

They are the ones identifying the content of the SF programmes for the next period 2014 - 2020

HOW IS YOUR SCIENCE / RESEARCH MINISTRY INVOLVED IN THAT PROCESS?

They may have a role to play in that context e.g. for strategies regarding RI, universities etc.

IS THERE A NATIONAL ROADMAP FOR INFRASTRUCTURES AND ARE YOU ON THAT LIST (OR CAN YOU GET ON IT)?

Research infrastructures are often co-financed by SF, being on that list gives a kind of priority status

HAS YOUR COUNTRY/REGION STARTED A SMART SPECIALISATION STRATEGY? POTENTIAL THAT YOUR AREA OF RESEARCH IN A BROAD SENSE IS A PRIORITY?

Smart specialisation strategies will be a pre-condition for SF funding. How could you fit in there?

ARE THERE CONCRETE LINKS ALREADY TO ACTIVITIES THAT MAY GET CO-FUNDED FROM HORIZON 2020?

JPI, Art. 185, ETP, KIC involvement important in the context of combined funding and strategic planning



TAKE ACTION

- ✓ GET IN TOUCH WITH THE RELEVANT PEOPLE
- ✓ PROMOTE THAT WHEN THE OPERATIONAL PROGRAMMES ARE BEING DEVELOPED THEY DO CONTAIN SUFFICIENTLY THE BROAD LINES OF FUNDING YOU COULD FIT IN RESEARCH AND INNOVATION / RESEARCH INFRASTRUCTURES
- ✓ LOOK WHERE YOUR ACTIVITIES FIT IN - training under the ESF; research and any infrastructures, under the ERDF.
- ✓ YOU NEED TO EXPLAIN WHY FUNDING YOUR PROJECT /INFRASTRUCTURE

Attention!! IS NOT ONLY VALUABLE FROM A SCIENTIFIC POINT OF VIEW BUT HOW IT HELPS THE GOALS OF THE STRUCTURAL FUNDS:

CREATION OF JOBS, ECONOMIC AND REGIONAL DEVELOPMENT, CAPACITY BUILDING, CONTRIBUTION TO GROWTH AND COHESION, in particular IN TERMS OF CREATION AND DEVELOPMENT OF INNOVATIVE BUSINESSES

(including spin-offs, start-ups, etc).



The role of the EU...

- ❑ **Strategic coordination** based on Research and Innovation Strategies for Smart Specialisation (RIS³), through reinforced cooperation between DG RTD and DG REGIO
- ❑ **Putting synergies into practice**
- ❑ **Facilitate the implementation of the ESFRI Roadmap and supports the prioritisation process**
- ❑ **EU will continue to support preparatory phases and design studies as in FP7, through dedicated actions within Horizon 2020**
- ❑ **EU would be able to help through the framework for an efficient European Research Area**
 - ✓ the implementation of such a policy implies constant dialogue / concerted actions between stakeholders notably for the support of methodological & technical developments (role of ESFRI and its working groups)



Thank you for your attention!

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Find out more:

www.ec.europa.eu/research/horizon2020

- The views expressed are those of the speaker and cannot be regarded as stating an official position of the European Commission.