

# European Research Infrastructure Landscape



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***Horizon Europe - Research  
Infrastructures***

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**#ResearchImpactEU  
#EUResearchArea**



# Why an EU approach to RIs?

## Beginning of the XXI century

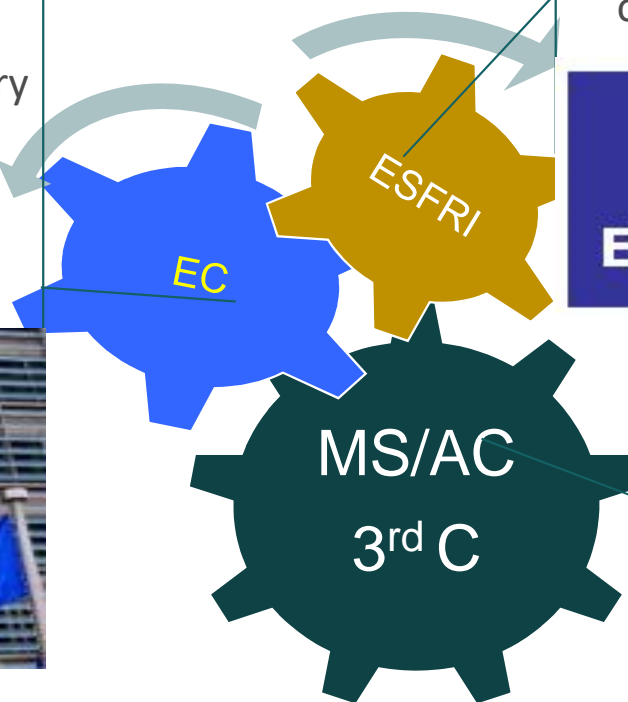
- National research infrastructures + few international organisations (e.g. CERN, European Southern Observatory, European Molecular Biology Laboratory) – fragmented, un-coordinated

## European Research Area (2000)

- A vision of a fully **developed, functioning and interconnected research space**, without barriers, where collaboration would flourish and a functional integration process would take place.
- **European RI policy:**
  - ✓ To help **pooling resources** so that the EU can acquire and operate research infrastructures at world level – RIs are becoming ever larger, **more complex and demanding to establish**, and more costly
  - ✓ To **open access** to the research infrastructures existing in the individual Member States to all European researchers – addressing **inequalities in access** to top facilities
  - ✓ To **coordinate and rationalise the development and use** of research infrastructures, avoiding duplication of effort – addressing a **fragmented landscape**
  - ✓ To **connect national research communities** and increase the overall quality of the research and innovation - fostering European **competitiveness** in research and innovation
  - ✓ To trigger the **exchange of best practice**, develop interoperability of facilities and resources, strengthening **connections between facilities** and building up **human resources capacity** and expertise

# European RI landscape - Key actors

Support to European RI policies;  
Funding design studies,  
transnational access, preparatory  
phases, targetted support to  
Implementation + regional  
development and cohesion  
funding



Development of European RI policies;  
Incubator of strategic RIs; Coordination  
of national priorities; ESFRI Roadmaps

**ESFRI**

**European Strategy Forum  
on Research Infrastructures**

National priorities; Funding across  
lifecycle; Scientific communities



# European RI Landscape – where are we?

## Development of an interconnected European RI landscape

- **Pan-European RIs**
  - **ESFRI Roadmap** – RI incubator (41+22=63), 6 broad thematic areas, single-sited and distributed – preparation and implementation supported by the EU, investments financed by national governments and EU regional development and cohesion funds (over EUR 20 billion), international membership (SKA)
  - **European Research Infrastructure Consortium (ERIC)** - legal framework (implementation), special legal entity for RIs, members – countries and international organisations, 19 ERICs
- **European RI networks** – set up through EU research programme (joint research activities, networking, access provision) opening up national RIs, common access programmes, H2020 – 90 networks, 37.000 researchers supported, open to international members and users
- **National facilities and labs** – large and small scale, national roadmaps (alignment of methodologies and priorities), often nodes of European RIs, national + EU funding (capacity building)

# What is ESFRI?

- An **informal body** composed by representatives of Member States, Associated Countries and the EC on issues related to research infrastructures, **providing advice** to the Council.
- A **platform** giving national authorities the opportunity to be informed of and to explore (i.e. without *a priori* commitments) international and national initiatives of European significance.
- An **incubator** of new RIs, where Member States structure their priorities and negotiate.
- A European **knowledge hub** on research infrastructures – setting standards for roadmap methodology, policy analysis and advice, information hub (COVID-19).

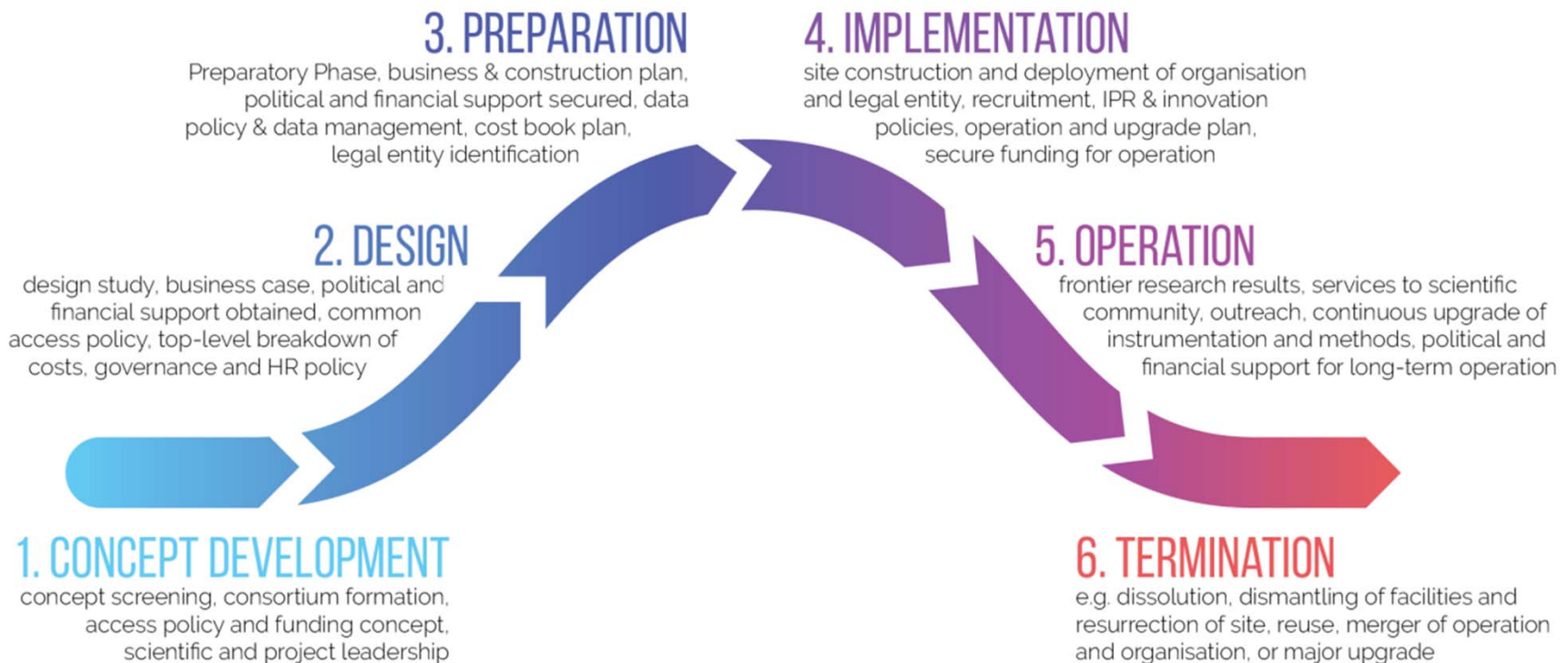
## ESFRI mandate

**ESFRI** was established in 2002 with a mandate from the EU Council (2001) to:

- support a **coherent and strategy-led approach** to policy-making on research infrastructures in Europe
- **facilitate multilateral initiatives** leading to the better use and development of research infrastructures
- **establish a European Roadmap** for research infrastructures (new and major upgrades, pan-European interest) for the coming 10-20 years, stimulate the implementation of these facilities, and update the Roadmap as the need arises (Council 2004, 2007, 2014, 2016);
- 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 (Council 2012);
- to **implement ERA Priority 2B**: Research Infrastructures (Council 2015).

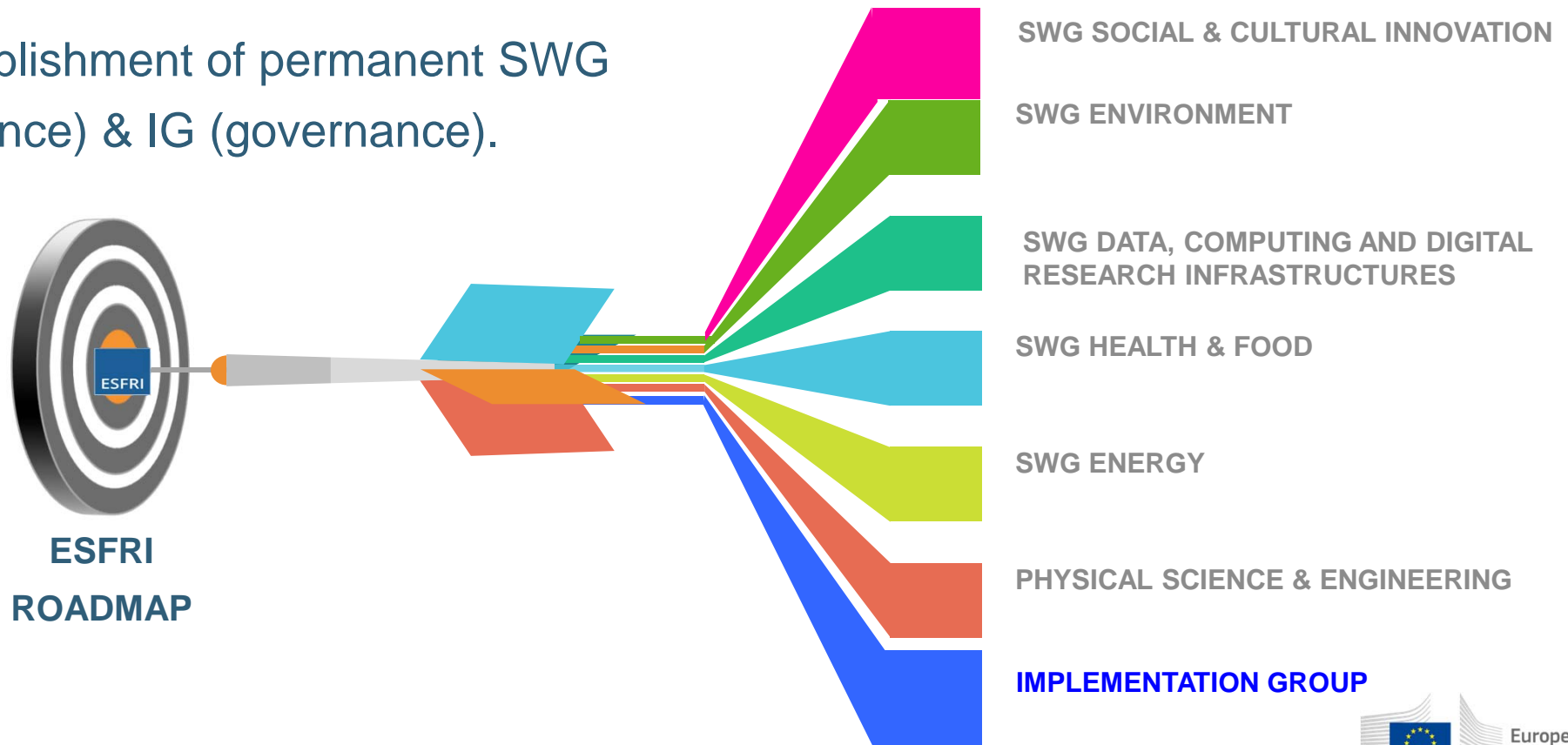


# Research Infrastructure Lifecycle



# ESFRI thematic coverage

Establishment of permanent SWG  
(science) & IG (governance).





# ESFRI Roadmap

## 1st ESFRI Roadmap cycle

- First Roadmap published in 2006, updated in 2008 and 2010, and contained **48 Projects** intended to foster European leadership across a broad range of scientific fields.
- Required **major financial investment** (~20 b€) and long- term commitment for operation (~2 b€/year)

## 2nd ESFRI Roadmap cycle

- **RI lifecycle concept** with minimal key requirements – comprehensive evaluation methodology
- ESFRI Roadmap 2016 and 2018: **Strategy report + Landscape Analysis + 37 ESFRI Landmarks** (~14,5 b€ capital value and ~1,4 b€/year) + **18 ESFRI Projects** (~3 b€ construction costs, 10-year rule) – strategic RIs for the future of ERA.
- ESFRI Roadmap update in 2021.



# ESFRI Roadmap 2021

22 ESFRI Projects (11 new)

41 ESFRI Landmarks (4 new)

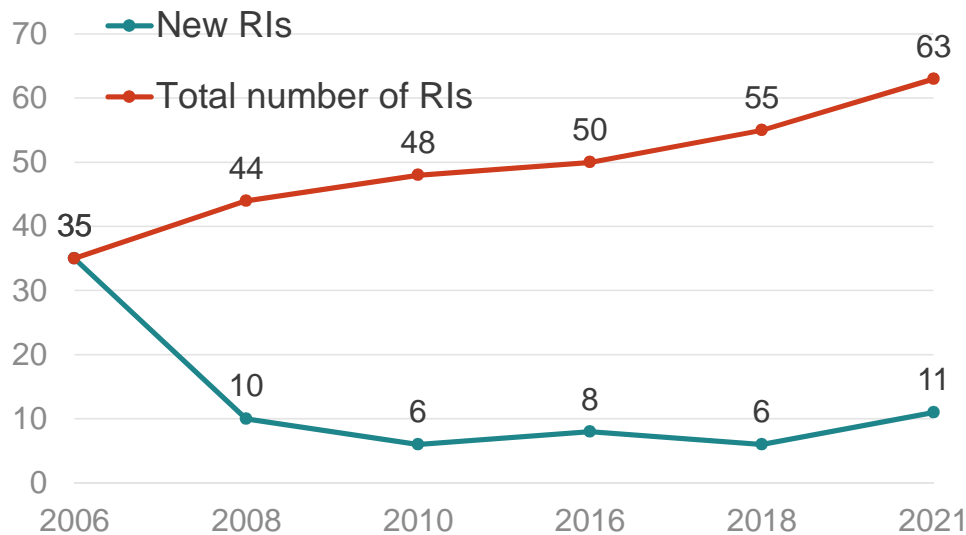
ENE	ENV	HF	PSE	SCI	e-RI
	DANUBIUS-RI	EMPHASIS	EST KM3NeT 2.0	E-RIHS	
					<b>2016</b>
IFMIF-DONES	DiSSCo eLTER	EU-IBISBA METROFOOD-RI		EHRI	
					<b>2018</b>
MARINERG-i		EIRENE RI	ET EuPRAXIA	GGP GUIDE OPERAS RESILIENCE	EBRAINS SLICES SoBigData++
					<b>2021</b>

ENE	ENV	HF	PSE	SCI	e-RI
JHR	EMSO ERIC EUROARGO ERIC IAGOS ICOS ERIC LIFEWATCH ERIC	BBMRI ERIC EATRIS ERIC ECRIN ERIC ELIXIR INFRA FRONTIER INSTRUCT ERIC	E-ELT ELI Eur. Spallation Source ERIC EU-XFEL FAIR ILL SKA SPIRAL2	CESSDA ERIC CLARIN ERIC DARIAH ERIC ESS ERIC SHARE ERIC	PRACE
					<b>2006</b>
ECCSEL ERIC	EISCAT-3D EPOS ERIC	EMBRC ERIC EU-OPEN Screen ERIC ERINHA EuroBio Imaging ERIC	EMFL CTA		
					<b>2008</b>
EU SOLARIS		AnaEE MIRRI			
					<b>2010</b>
	ACTRIS		ESRF-EBS* HL-LHC		
					<b>2016</b>

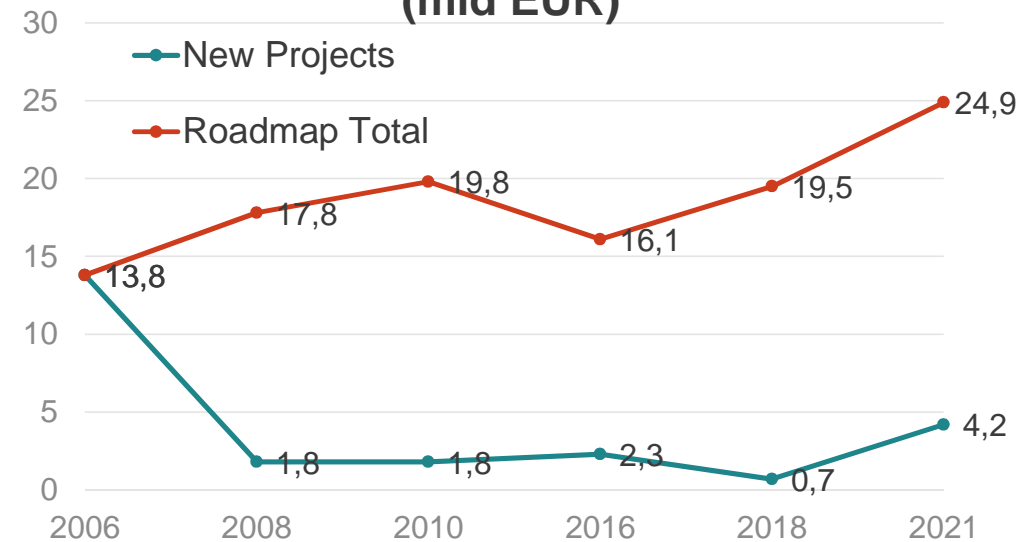


# ESFRI Roadmap – ambitious investment agenda

## RIs on the ESFRI Roadmap



## Investments in the ESFRI Roadmap (mld EUR)



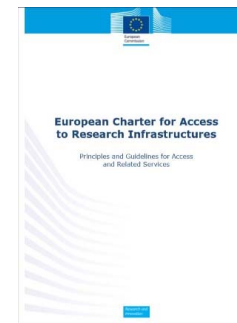
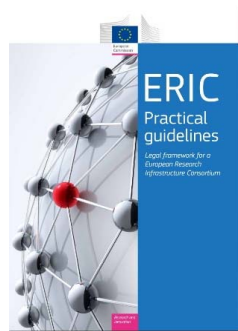
**ESFRI RIs become more inclusive – significant membership growth in Landmarks (important role of ERICs) + increasing political support for new Projects**

# ESFRI strategic role in practice

- ESFRI Roadmap identifies **scientific priorities**
- ESFRI Roadmap **facilitates commitments** and **access to funds** at national level
- ESFRI Roadmap **facilitates access to structural funds** (ex ante conditionality) and other sources of **funding** (ex. EIB)
- **Analytical work** testing and advancing RI policy concepts:
  - responding to EU Council of Ministers' requests: investments in e-Infrastructures, long-term sustainability action plan, RI prioritisation, monitoring of RI performance
  - own initiatives: socio-economic impact of RIs, links with industry and innovation, evolution of neutron sources
- **ERA Roadmap implementation**
- Providing **visibility** to European RIs
- Facilitating **links** of European RIs with other EU and global partners

# European Commission support for RIs

- Member of ESFRI, its Executive Board and Working Groups + ESFRI Executive Secretariat
- Funding RI development across the lifecycle (structural funds, Framework Programmes for R&I, sectoral programmes)
- Funding integration and access to RIs
- RI policy development – **ERIC** legal framework, **long-term sustainability** of RIs, **Charter for Access** to RIs



- RI policy support actions – RI managers and operators training, best practices in national roadmapping, RI impact framework, European RI database & catalogue of services, international cooperation of RIs

# Horizon Europe



## Pillar I

EXCELLENT SCIENCE

- European Research Council
- Marie Skłodowska-Curie
- [Research Infrastructures](#)



## Pillar II

GLOBAL CHALLENGES & EUROPEAN INDUSTRIAL COMPETITIVENESS

6 Clusters

- Health
- Culture, Creativity & Inclusive Society
- Civil Security for Society
- Digital, Industry & Space
- Climate, Energy & Mobility
- Food, Bioeconomy, Natural Resources, Agriculture & Environment
- Joint Research Centre



## Pillar III

INNOVATIVE EUROPE

- European Innovation Council
- European Innovation Ecosystems
- European Institute of Innovation & Technology

### WIDENING PARTICIPATION AND STRENGTHENING THE EUROPEAN RESEARCH AREA

- Widening participation & spreading excellence
- Reforming & Enhancing the European R&I system



# Research Infrastructures in HE – four intervention areas

**Consolidating and  
Developing the Landscape  
of European Research  
Infrastructures**

**Opening, Integrating and  
Interconnecting Research  
Infrastructures**

**The innovation potential of  
European Research  
Infrastructures and  
activities for Innovation &  
Training**

**Reinforcing European  
Research Infrastructure  
policy and International  
Cooperation**

**Budget: EUR 2.4  
billion**

# Thank you!



## For more info:

- Commission's website on Research Infrastructures:  
[https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/european-research-infrastructures\\_en](https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/european-research-infrastructures_en)
- Horizon Europe:  
[https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe\\_en](https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en)
- European Strategy Forum on Research Infrastructures:  
[www.esfri.eu](http://www.esfri.eu)

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