



European Strategy Forum
on Research Infrastructures

ESFRI ROADMAP 2021

Launch of the 2021 ESFRI Roadmap on Research Infrastructures in Europe

7 December 2021

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ESFRI Roadmap 2021

Prepared on cycles based on the request of the COMPET 2018
6th edition

On 26 Nov. 2021 presented to the COMPET

ROADMAP 2021
**STRATEGY
REPORT
ON RESEARCH
INFRASTRUCTURES**

CONTENT

1. **ESFRI Strategy Report**
2. **Analysis of RIs landscape in Europe and globally (+ strategic dimension)**
3. **List of pan-European RI Projects and of operational RIs (ESFRI Landmarks)**

ESFRI Roadmapping concept (evolution)



Hans Chang

**ESFRI Concept
ESFRI Creation**
established with
a mandate from
the Council of
the EU



John Wood

1st ROADMAP for
the construction
and development
of the next
generation of
pan-European RIs



Carlo Rizzuto

1st UPDATE
Increasing the
number of RIs
of **pan-European
relevance**



**Beatrix
Vierkorn-Rudolph**

2nd UPDATE
focusing on
Energy, Food and
Biology



John Womersley

Update process
identified
projects expected
to move to
**implementation
(LM)** in <10 years
from their first
inclusion on the
Roadmap



Giorgio Rossi

**Consolidation
& incorporation**
of the
mandates of
Council:
sustainability,
innovation, and
hub of funders
of e-infra



Jan Hrušák

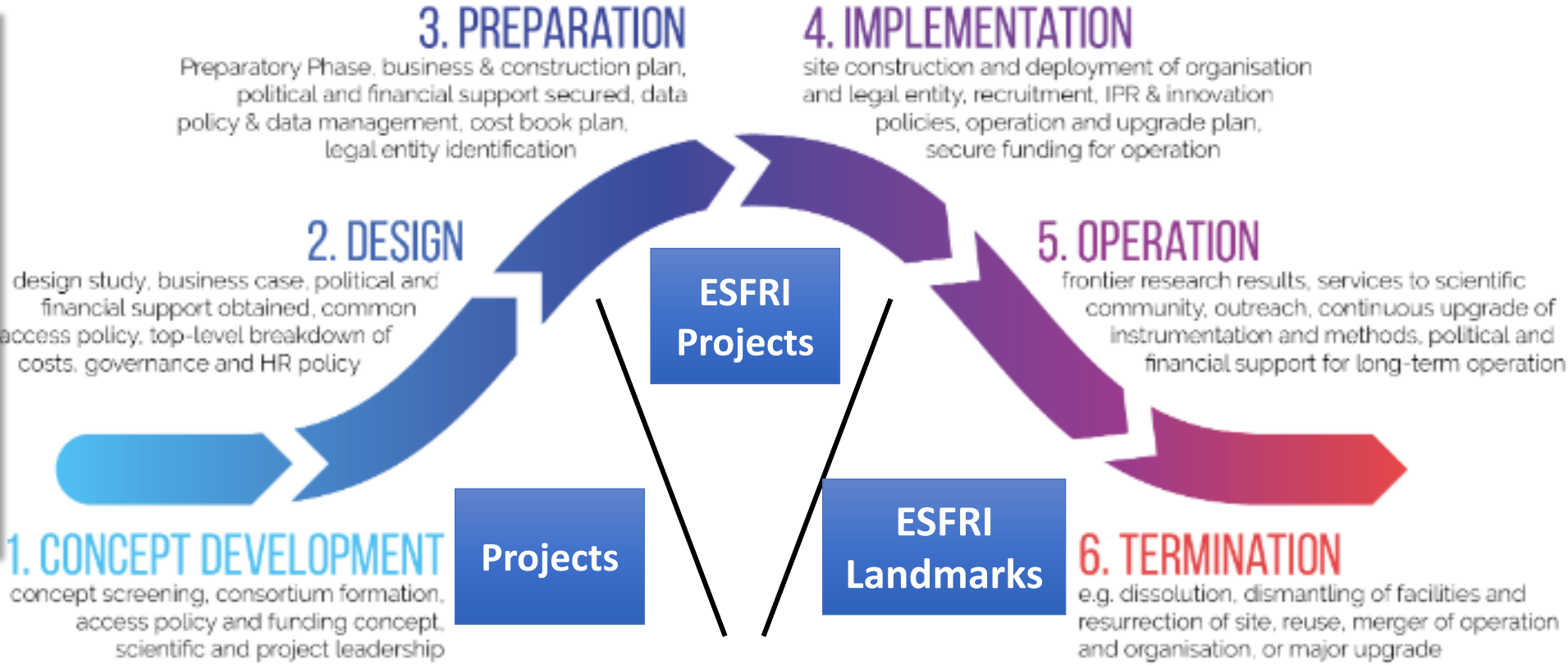
**Integration
&relevance**
**strategic
positioning** in
ERA; paradigm
shift from
planning to
operation



ESFRI RM 2018: RIs (18 projects and 37 landmarks) -> RM 2021 : RIs (+11 projects and +4 landmarks)

Lifecycle approach of RIs

The evolution in time of **ESFRI Projects** and **ESFRI Landmarks** and the needs and targets of the RI implementation are understood as a sequence of phases from the **CONCEPT** to **OPERATION** and to **TERMINATION**





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Presented to the public at the ESFRI Forum RM launch event on
7 December 2021

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ESFRI Strategy Report

What is new in the ESFRI Roadmap 2021

STRENGTHENING THE EUROPEAN RI ECOSYSTEM

- **ESFRI Landmarks is one of the essential pillars of the European Research and innovation Area**
- ESFRI unifying criteria for monitoring and requirements provide impetus for advancement in disciplinary and multi-disciplinary research => supporting its impact on innovation and meeting societal needs

STRATEGIC LANDSCAPE ANALYSIS AS A KEY ELEMENT

- The LA adopts a more **service-driven and impact-oriented approach** maintaining the principle of **excellence in science** at the heart of European RIs
- The LA highlights significant RIs and identifies gaps in the EU and global landscape of RIs

NEW PROJECTS FILLING GAPS IN EUROPEAN RI CAPACITIES

- The new entries in the Roadmap 2021 reinforce important areas of research in which insufficient capacities existed in Europe



LANDSCAPE ANALYSIS

Landscape Analysis (LA) is a key part of the ESFRI Roadmap 2021

- LA provides an advanced scrutiny of **the scientific needs and existing RI gaps**, as the prerequisite for **strategic priority setting** at European and national level, as any **future investment in RIs** must be evaluated against its impact on the RI landscape
 - => Essential role of the LA was already acknowledged by the Council conclusions of 30 Nov 2018 and is gaining on importance
- **LA is getting more strategic** – describing gaps of European RI ecosystem; integration of RIs towards a global RI ecosystem; integration of RI in open networks (EOSC)
- LA adopts a more **service-driven and impact-oriented approach** maintaining the principle of excellence science
- Landscape analysis refers to the **relevance of ESFRI RIs** for Sustainable Development Goals (SDGs)



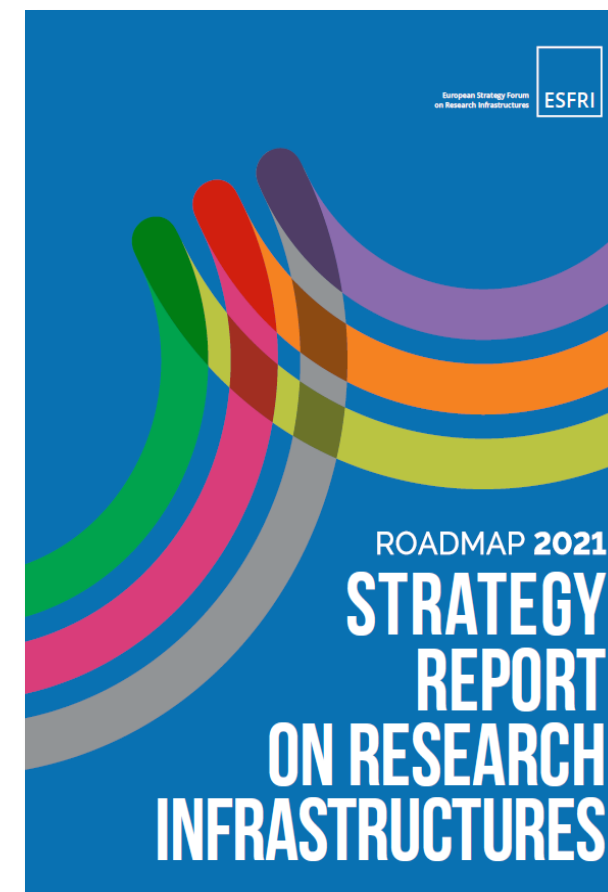
LA consists of three sections:

- **Section 1: Analysis for each scientific domain** – gives insight for each domain and indicates in which direction it should evolve and how it can be optimized by stronger collaboration of existing RIs and strategic investments in the future
- **Section 2: Identification of interconnections among RIs across all scientific domains** – giving an **effective contextual analysis** of links and complementarities between the existing European RIs, including **scientific trends across domains**
- **Section 3: Focus on RIs' services and their broader impacts** – describing explicitly the contributions of RIs to societal challenges, the capacity to respond to emergencies (SDGs, digital transformation, COVID-19 crisis), contribution to societal resilience and societal well being

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The Projects and Landmarks

- The best **European science facilities** based on a thorough evaluation and selection procedure
- **New pan-European RI projects** (new RIs in progress towards implementation)
 - 18 new proposals (environment, energy, health and food, physical science and engineering, social and cultural Innovation, digit)
 - **11 new ESFRI Projects selected**
- **Operational RIs - Landmarks** (successfully implemented RIs)
 - Monitoring - 5 project of 2010 and 6 projects of 2016
 - 4 new LM added after monitoring of the 2010 projects and ARCTRIS (2016 RM project)
- The focus also is on **clustering of RIs**, their horizontal linkages and the projection of the Open Science concept



RM 2018: RIs (18 projects and 37 landmarks) -> RM 2021 : RIs (+11 projects and +4 landmarks)

List of new pan-European RI Projects

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	ACRONYM	TITLE	POLITICAL SUPPORT
DIGIT	EBRAINS	European Brain ReseArch INfrastructureS	FR, BG, EL, IT, NL, NO, ES, SE, CH, DK
	SLICES	Scientific Large-scale Infrastructure for Computing/Communication Experimental Studies	FR, CY, FI, EL, IT, LU, NL, ES, CH, PL
	SoBigData++ RI	European Integrated Infrastructure for Social Mining and Big Data Analytics	IT, EE, CH
ENE	MARINERG-I	Offshore Renewable Energy Research Infrastructure	IE, ES, PT, BE, UK
H F	EIRENE RI	Research Infrastructure for EnvlRonmental Exposure assessment in Europe	CZ, AT, NL, SK, EL, IT, IS, DE
PSE	ET	Einstein Telescope	IT, ES, NL, BE, PL
	EuPRAXIA	European Plasma Research Accelerator with Excellence in Applications	IT, PT, HU, CZ, UK
SCI	GGP	The Generations and Gender Programme	NL, HR, EE, DE, HU, ES, SE, PL, AT
	GUIDE	Growing Up in Digital Europe-EuroCohort	IE, HR, EE, LV, PT, ES, HU, UK
	OPERAS	Open Access in the European Research Area through Scholarly Communication	FR, HR, IT, PT, DE, EL, NL, PL, UK
	RESILIENCE	Religious Studies Infrastructure: Tools, Innovation, Experts, Connections and Centers	IT, IL, BA, BG, NL, AL, EL



ESFRI Roadmap 2021

List of operational RIs (Landmarks) – formal ESFRI PROJECTS 2010/16

	ACRONYM	TITLE	POLITICAL SUPPORT
HEALTH & FOOD	AnaEE	Infrastructure for Analysis and Experimentation on Ecosystems	FR, BE, CZ, DK, FI
	MIRRI	Microbial Resource Research Infrastructure	PT, ES, BE, EL, FR, LV, NL, RU, RO
ENVIR.	ACTRIS	Aerosol, Cloud and Trace gases Research Infrastructure	FI, AT, BE, BG, CY, CZ, FR, EL, IT, NL, NO, PL, RO, ES, CH
ENERGY	EU-SOLARIS	European Solar Research Infrastructure for Concentrated Solar Power	ES, CY, DE, EL, FR, TR, PT



Lessons learned

THE EVOLVING ROLE OF RIS

- The ESFRI process constitutes an **important strategic framework for the development of RIs of pan-European relevance and thus for the ERA** as a whole

MAKING SCIENCE HAPPEN

- After a comprehensive reflection process on a set of topics ESFRI prepared a policy note on the **future of RIs in the renewed ERA** and started to implement first measures (stakeholders engagement)

THE RIS AND FAIR OPEN DATA

- ESFRI RIs are unique in ensuring robust quality control on scientific FAIR data

RIS AND THE COVID-19 RESPONSE

- ESFRI and other RIs have proven capacity to address social and global challenges and to respond to emergencies (e.g. environmental disasters, health issues, Energy and others)



Challenges and strategy for the future

RIS IN THE RENEWED ERA

- RIs play an **ever-increasing role in the implementation of EU priorities and policy actions (PACT)**
- **Effective interconnection among the RIs forms a systematically integrated ecosystem** that is a significant element of the renewed ERA
- **The continuous adjustment and improvement of its assessment methodology** enables ESFRI to continue to fulfil its strategic role and serve the needs of MS/AC according to the received mandates
- ESFRI closes the entire policy cycle and provides strategic advice on many RI related issues

STAKEHOLDER ENGAGEMENT AND COMMUNICATION

- ESFRI **extends its engagement activities**, such as Open sessions and Stakeholder meetings
- These activities, along with the existing ones, will further strengthen ESFRI to implement its mission



Challenges and strategy for the future II

MONITORING OF LANDMARKS

- **ESFRI`s Report on monitoring of Landmarks** must be implemented and it provides directions for uptake of the monitoring approach beyond the LM (co-creation with MS/AC and RIs)

THE INNOVATION CHALLENGE

- ESFRI RIs constitute very particular **innovation ecosystems** with focus on services and broad outreach, i.e. environment for **academia/industry collaborations** with significant potential on broader economic and social context (incubating spin-offs, fostering applications and technologies etc.)

ESFRI AT THE GLOBAL SCALE

- Science is global by its nature, RIs are pooling resources, sharing knowledge, and **are an essential tool for the international deployment of the open science** / Global role of ESFRI – science diplomacy



Points to be highlighted

Important role of RIs in ERA

- RIs are **strategic investments across borders of sectoral domains**, contributing to European **strategic agendas** and enabling European research and innovation to address **pressing and complex societal challenges**
- RIs create already now a healthy, sustainable and integrated research ecosystem in Europe, **produce high-quality FAIR data** and are crucial for successful implementation of EOSC

Social-economic impact

- RIs provide unique training opportunities; RIs play an important role in education and upskilling of new generations of scientists, engineers and data professionals
- RIs are powerful resource for industry; RIs foster innovative products and services to the benefit of economy and society and to increase their visibility and impact



Take home messages

- **ESFRI Roadmap is more than only the list of projects, the Strategy Report and the Landscape analysis are of equal strategic importance**
- **RIs are the backbone of the ERA**, supporting excellence in science, but as knowledge and Innovation hubs are RIs forming basis of competitiveness with regional to global impact
- strategic integration to an **interconnected ecosystem** is required to enhance impact
- ESFRI has been working on the monitoring methodology for three years. The monitoring once **properly implemented in a co-creation manner** (with the MS/AC and RIs), can become **the role model** for monitoring beyond the ESFRI level
 - The implementation of the monitoring methodology begins now and it will be applied during the landmark's evaluation (2023)



ESFRI

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Thank you

Jan Hrušák

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