



# **Chapter 25 Science & Research**

## **Research Infrastructures and e-Infrastructures Brussels 11 March 2019**

European Commission – DG Research & Innovation

*These slides accompany the explanation of the acquis to Albania and North Macedonia and can only be used for that purpose. Their content is subject to further development of the acquis and interpretation by the Court of Justice of the European Union.*

# Research Infrastructures and e-Research Infrastructures

## European Research Area (ERA)

- Part of priority 2: Optimal transnational co-operation and competition, including 'optimal transnational cooperation and competition' and 'Research Infrastructures'

## Horizon 2020

- Part of the Excellence Pillar together with Marie Skłodowska-Curie and European Research Council (ERC)

## Horizon Europe

- Part of the First Pillar together with Marie Skłodowska-Curie and ERC

## 2017 Staff Working Document

- Long Term Sustainability of Research Infrastructures (SWD(2017) 323 final)

# Research Infrastructures

## **European Strategy Forum on Research Infrastructures (ESFRI)**

- Informal Forum set up by Council in 2002 composed of MS, associated countries and the Commission
- Main achievement establishment of ESFRI Roadmaps: 1<sup>st</sup> Roadmap in 2006, updated in 2008, 2010, 2016 and 2018
- 2018 Roadmap contains 18 Projects and 37 Landmarks (delivering services)

## **European Research Infrastructure Consortium (ERIC)**

- Council Regulation (EC) No 723/2009 on the Community legal framework for a European Research Infrastructure Consortium( “ERIC Regulation”) adopted in 2009 to facilitate the establishment and the operation of large European research infrastructures among several Member States and associated countries by providing a new legal instrument, the European Research Infrastructure Consortium (ERIC).



# European Strategy Forum on Research Infrastructures (ESFRI)

# 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

- ESFRI Roadmap 2016 - **29 ESFRI Landmarks** (~12,4 b€ capital value and ~1,4 b€/year) - fulfilment of the IU commitment no. 5 (60% implemented by the end of 2015) + **21 ESFRI Projects** (~3 b€ construction costs) – strategic RIs for the future of ERA + **Landscape Analysis**.

# ESFRI Roadmap 2018



**Strategic approach** - landscape and gap analysis, pan-European dimension, impact of RIs, global opportunities

**Focus** - ~25 Projects on the new Roadmap



**More mature entry level** - conceptual design and feasibility study done, financial commitment, political support

**Time-limited window of opportunity:**

10 years for implementation

**Life-cycle approach** (first step)

Concept of the ESFRI Landmarks and regular assessment

**18 projects + 37 Landmarks**

***Next Roadmap Update in 2021***

## ► ESFRI PROJECTS

## ESFRI LANDMARKS

ENERGY

ENVIRONMENT

HEALTH &amp; FOOD

PHYSICAL SCIENCES &amp; ENGINEERING

SOCIAL &amp; CULTURAL INNOVATION

DIGIT

NAME	FULL NAME	TYPE	LEGAL STATUS (Y)	ROADMAP ENTRY (Y)	OPERATION START (Y)	CONSTRUCTION COSTS (M€)	OPERATION COSTS (M€/Y)
<b>EU-SOLARIS</b>	European Solar Research Infrastructure for Concentrated Solar Power	distributed		2010	2020*	6	0.2
<b>IFMIF-DONES</b>	International Fusion Materials Irradiation Facility - DEMO Oriented Neutron Source	single-sited		2018	2029*	420	50
<b>MYRRHA</b>	Multi-purpose Hybrid Research Reactor for High-tech Applications	single-sited		2010	2027*	1.352	74
<b>WindScanner</b>	European WindScanner Facility	distributed		2010	2021*	6.1	2
<b>ACTRIS</b>	Aerosols, Clouds and Trace gases Research Infrastructure	distributed		2016	2025*	190	50
<b>DANUBIUS-RI</b>	International Centre for Advanced Studies on River-Sea Systems	distributed		2016	2022*	222	28
<b>DISSCo</b>	Distributed System of Scientific Collections	distributed		2018	2025*	69.4	12.1
<b>eLTER</b>	Long-Term Ecosystem Research in Europe	distributed		2018	2026*	94	35
<b>AnaEE</b>	Infrastructure for Analysis and Experimentation on Ecosystems	distributed	ERIC Step1, 2018	2010	2019*	1.1	0.8
<b>EMPHASIS</b>	European Infrastructure for Multi-scale Plant Phenomics and Simulation	distributed		2016	2021*	73	3.6
<b>EU-IBISBA</b>	Industrial Biotechnology Innovation and Synthetic Biology Accelerator	distributed		2018	2025*	11	65.1
<b>ISBE</b>	Infrastructure for System Biology Europe	distributed		2010	2019*	10	5.2
<b>METROFOOD-RI</b>	Infrastructure for promoting Metrology in Food and Nutrition	distributed		2018	2019*	78.8	31
<b>MIRRI</b>	Microbial Resource Research Infrastructure	distributed		2010	2021*	0.8	0.7
<b>EST</b>	European Solar Telescope	single-sited		2016	2029*	200	12
<b>KM3Net 2.0</b>	KM3 Neutrino Telescope 2.0	distributed		2016	2020*	151	3

## 18 PROJECTS

NAME	FULL NAME	TYPE	LEGAL STATUS (Y)	ROADMAP ENTRY (Y)	OPERATION START (Y)	CAPITAL VALUE (M€)	OPERATION COSTS (M€/Y)
<b>ECCSELERIC</b>	European Carbon Dioxide Capture and Storage Laboratory Infrastructure	distributed	ERIC, 2017	2008	2016	1.000	0.85
<b>JHR</b>	Jules Horowitz Reactor	single-sited		2006	2022*	1.800	NA
<b>BISCAT_3D</b>	Next generation European Incoherent Scatter radar system	single-sited	BISCAT Scientific Association, 1975	2008	2022*	123	5.1
<b>EMSO ERIC</b>	European Multidisciplinary Seafloor and water-column Observatory	distributed	ERIC, 2016	2006	2016	100	20
<b>EPOS</b>	European Plate Observing System	distributed	ERIC Step2, 2018	2008	2020*	500	18
<b>EURO-ARGO ERIC</b>	European contribution to the international Argo Programme	distributed	ERIC, 2014	2006	2014	10	8
<b>IAGOS</b>	In-service Aircraft for a Global Observing System	distributed	AISBL, 2014	2006	2014	9.2	7
<b>ICOS ERIC</b>	Integrated Carbon Observation System	distributed	ERIC, 2015	2006	2016	116	24.2
<b>LifeWatch ERIC</b>	e-Infrastructure for Biodiversity and Ecosystem Research	distributed	ERIC, 2017	2006	2017	150	12
<b>BBMRI ERIC</b>	Biobanking and BioMolecular Resources Research Infrastructure	distributed	ERIC, 2013	2006	2014	195	3.5
<b>EATRIS ERIC</b>	European Advanced Translational Research Infrastructure in Medicine	distributed	ERIC, 2013	2006	2013	500	2.5
<b>ECRIN ERIC</b>	European Clinical Research Infrastructure Network	distributed	ERIC, 2013	2006	2014	5	5
<b>ELIXIR</b>	A distributed infrastructure for life-science information	distributed	ELIXIR Consortium Agreement, 2013	2006	2014	125	95
<b>EMBRC ERIC</b>	European Marine Biological Resource Centre	distributed	ERIC, 2018	2008	2017	164.4	11.2
<b>ERINHA</b>	European Research Infrastructure on Highly Pathogenic Agents	distributed	AISBL, 2017	2008	2018	5.8	0.7
<b>EU-OPENSREEN ERIC</b>	European Infrastructure of Open Screening Platforms for Chemical Biology	distributed	ERIC, 2018	2008	2019*	82.3	1.2
<b>Euro-BioImaging</b>	European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences	distributed	ERIC Step2, 2018	2008	2016	90	1.6
<b>INFRAFRONTIER</b>	European Research Infrastructure for the generation, phenotyping, archiving and distribution of mouse disease models	distributed	GmbH, 2013	2006	2013	180	80
<b>INSTRUCT ERIC</b>	Integrated Structural Biology Infrastructure	distributed	ERIC, 2017	2006	2017	400	30
<b>CTA</b>	Cherenkov Telescope Array	single-sited	gGmbH, 2014	2008	2024*	400	20
<b>ELI</b>	Extreme Light Infrastructure	distributed	AISBL, 2013	2006	2018	850	80
<b>ELT</b>	Extremely Large Telescope	single-sited	ESO*	2006	2024*	1.120	45
<b>EMFL</b>	European Magnetic Field Laboratory	distributed	AISBL, 2015	2008	2014	170	20
<b>ESRF EBS</b>	European Synchrotron Radiation Facility Extremely Brilliant Source	single-sited	ESRF*	2016	2023*	128	82
<b>European Spallation Source ERIC</b>	European Spallation Source	single-sited	ERIC, 2015	2006	2025*	1.843	140
<b>European XFEL</b>	European X-Ray Free-Electron Laser Facility	single-sited	European XFEL*	2006	2017	1.490	118
<b>FAIR</b>	Facility for Antiproton and Ion Research	single-sited	GmbH, 2010	2006	2025*	NA	234
<b>HL-LHC</b>	High-Luminosity Large Hadron Collider	single-sited	CERN*	2016	2026*	1.408	136
<b>ILL</b>	Institut Max von Laue-Paul Langevin	single-sited	ILL*	2006	2020*	188	97
<b>SKA</b>	Square Kilometre Array	single-sited	SKAO, 2011	2006	2027*	1.000	77
<b>SPIRAL2</b>	Système de Production d'Ions Radioactifs en Ligne de 2e génération	single-sited	GANIL	2006	2019*	281	6
<b>CESSDA ERIC</b>	Consortium of European Social Science Data Archives	distributed	ERIC, 2017	2006	2013	117	39
<b>CLARIN ERIC</b>	Common Language Resources and Technology Infrastructure	distributed	ERIC, 2012	2006	2012	NA	14
<b>DARIAH ERIC</b>	Digital Research Infrastructure for the Arts and Humanities	distributed	ERIC, 2014	2006	2019*	NA	0.7
<b>ESS ERIC</b>	European Social Survey	distributed	ERIC, 2013	2006	2013	NA	2.5
<b>SHARE ERIC</b>	Survey of Health, Ageing and Retirement in Europe	distributed	ERIC, 2011	2006	2011	250	18
<b>PRACE</b>	Partnership for Advanced Computing in Europe	distributed	AISBL, 2010	2006	2010	500	60

## 37 LANDMARKS

NA=Not Available

\*expected

NA=Not Available

\*expected

\* EIROforum member

## ESFRI – success story of the ERA

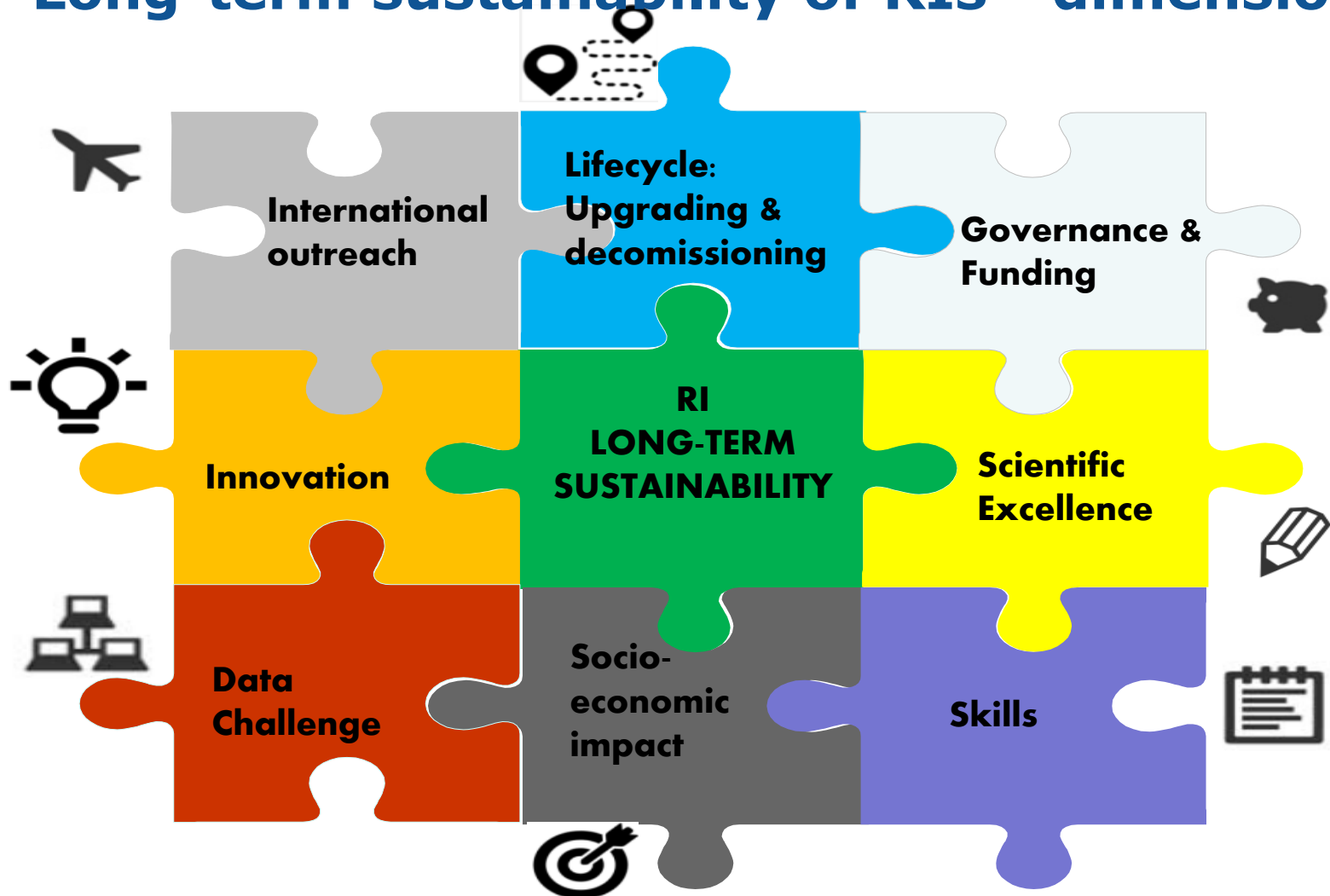
- ERA Roadmap – ESFRI responsible for **Priority 2B 'Research Infrastructures'** – Task: increasing the effectiveness of investments in RIs in Europe
- **ERA Progress Report 2018** – very good result and clear progress in comparison to 2016
  - **National Roadmaps** – more countries have NRs, they are more recently updated and contain more essential information
  - **Participation in ESFRI RIs** – significant growth among less well performing countries – demonstrates increasing inclusiveness and accessibility
- **ERA Governance Review 2018** – ESFRI considered as the most effective ERA-related Group, achieving most tangible results and strongest impact<sub>8</sub>



## Evolution of the RI ecosystem in Europe

- Growing **ESFRI Roadmap** – 37 Landmarks + 18 Projects – increasing number of operational RIs providing services
- Maturing **networks of national RIs** providing transnational access – EU-funded integrating activities (often including ESFRI RIs)
- **Integration initiatives of RI communities** (LEAPS, LENS, ERF, ERIC Forum, medical RIs)
- Increasing **complexity of the RI Landscape** – how to identify and address the gaps?

# Long-term sustainability of RIs - dimensions



## Council mandates for ESFRI

Conclusions of 29 May 2018 on "Accelerating knowledge circulation in the EU", section on the long-term sustainability of Research Infrastructures:

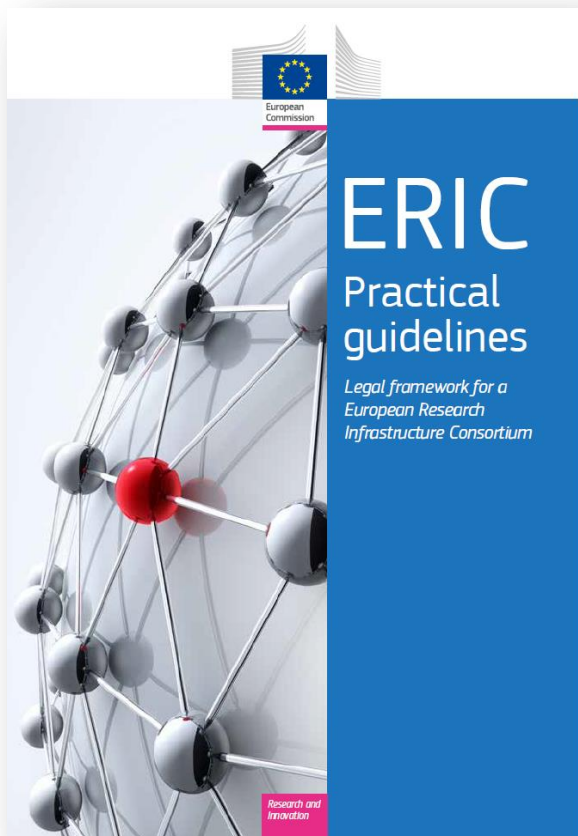
"17. ACKNOWLEDGES the positive role of ESFRI in fostering the development of the state-of-the-art Research Infrastructures in Europe and STRESSES the need for further strengthening and consolidation of the landscape of pan-European Research Infrastructures in view of their long term sustainability"

18. UNDERLINES the importance of further efforts within the framework of ESFRI for a better aligned decision making for setting-up and participating in ESFRI Research Infrastructures in particular by exchanging experience about national roadmaps procedures and their national budget lines practices"



# **European Research Infrastructure Consortium (ERIC)**

# ERIC - European Research Infrastructure Consortium (Council Regulation (EC) No 723/2009 of 25 June 2009)



A **legal instrument** at EU level, to facilitate the joint establishment and operation of RI of European interest.

- **Legal personality** recognized in all Member States
- **Qualifies as an international organization for the purposes of VAT** (exemption under certain limits and conditions from VAT and excise duties) **and Public Procurement Directives**

# ERIC Regulation

- Amended in December 2013 to better reflect contributions of associated countries in particular in terms of voting rights
- First Report on the application of the ERIC Regulation was adopted by the Commission on 14 July 2014 COM(2014) 460 final and transmitted to Council and European Parliament
- Second Report on the application of the ERIC Regulation was submitted by the Commission in 2018 and reported substantial progress on the uptake of the Regulation (20 ERICs established by summer 2018)

# Membership of an ERIC

**Exclusively:** Member States  
Associated Countries  
Third States  
Intergovernmental organisations

An ERIC must at all times have at least one MS and two MS or AC as members.

MS and AC shall jointly hold the majority of the voting rights in the assembly of members.

A State may be represented by one or more public entities or private entities with a public-service mission

# Characteristics ERIC

- Public Research, i.e.: mostly non-economic activities
- Established by Commission Implementing Decision
- Exemption VAT and Excise duties for non-economic activities
- Exemption Public Procurement Directives
- Dispute settlement concerning internal ERIC issues - European Court of Justice
- Legal personality recognised by all MS
- Open to third countries but must recognise ERIC Regulation



# Example Recognition ERIC

Bern, July 13, 2015

## Declaration of Switzerland concerning its membership in the European Spallation Source, set up as a European Research Infrastructure Consortium

Dear Mr. Tuinder,

1. Switzerland, represented by the Federal Council, in view of its application for membership of the European Spallation Source (ESS), declares that:

(a) ESS shall have legal personality and capacity under the laws and regulations of Switzerland in accordance with Article 7(1) and (2) of Council Regulation (EC) No 723/2009 of 25 June 2009 on the Community Legal Framework for a European Research Infrastructure Consortium (ERIC)<sup>1</sup>, as amended by Council Regulation (EU) No 1261/2013 of 2 December 2013<sup>2</sup>;

(b) its participation in ESS shall be subject to rules determined in application of Article 15 of the ERIC Regulation.

2. Switzerland shall accord to ESS treatment equivalent to that following:

(a) Article 5(1)(d) of Regulation (EC) No 723/2009 subject to the limits and conditions laid down in an agreement between the members of ESS; and

(b) Article 7(3) of Regulation (EC) No 723/2009.

3. This Declaration shall bind Switzerland as long as Switzerland remains member of ESS.

Thank you for noting our declaration and kind regards,



Johann N. Schneider-Ammann  
Federal Councillor

# ERIC Implementation

- Until now, with the exception of the European Spallation Source, all established ERICs concern distributed RIs
- Two ERICs; CERIC-ERIC and JIV- ERIC are not part of the ESFRI Roadmap
- Around 20 MS and associated countries (Switzerland, Norway, Serbia and Israel) are involved in ERICs as members or observers
- ERICs are hosted now in 10 countries; Netherlands (CLARIN, EATRIS and JIV), Germany (SHARE, EU-OPENSOURCE), France (ECRIN, Euro-Argo, DARIAH, EMBRC), Austria (BBMRI), UK (ESS, INSTRUCT), Sweden (European Spallation Source), Finland (ICOS), Norway (ECCSEL, CESSDA), Spain (LifeWatch) and Italy (CERIC, EMSO and EPOS)

# ERIC Implementation (1/3)

## *20 ERICs Established*

- 2011 SHARE(Survey of Health, Ageing and Retirement in Europe)(DE)
- 2012 CLARIN (Common Language Resources and Technology Infrastructure)(NL)
- 2013 EATRIS (European Advanced Translational Research Infrastructure in Medicine)(NL), ESS(European Social Survey)(UK), BBMRI (Biobanking and Biomolecular Research Infrastructure)(AT), ECRIN (European Clinical Research Infrastructure Network)(FR)

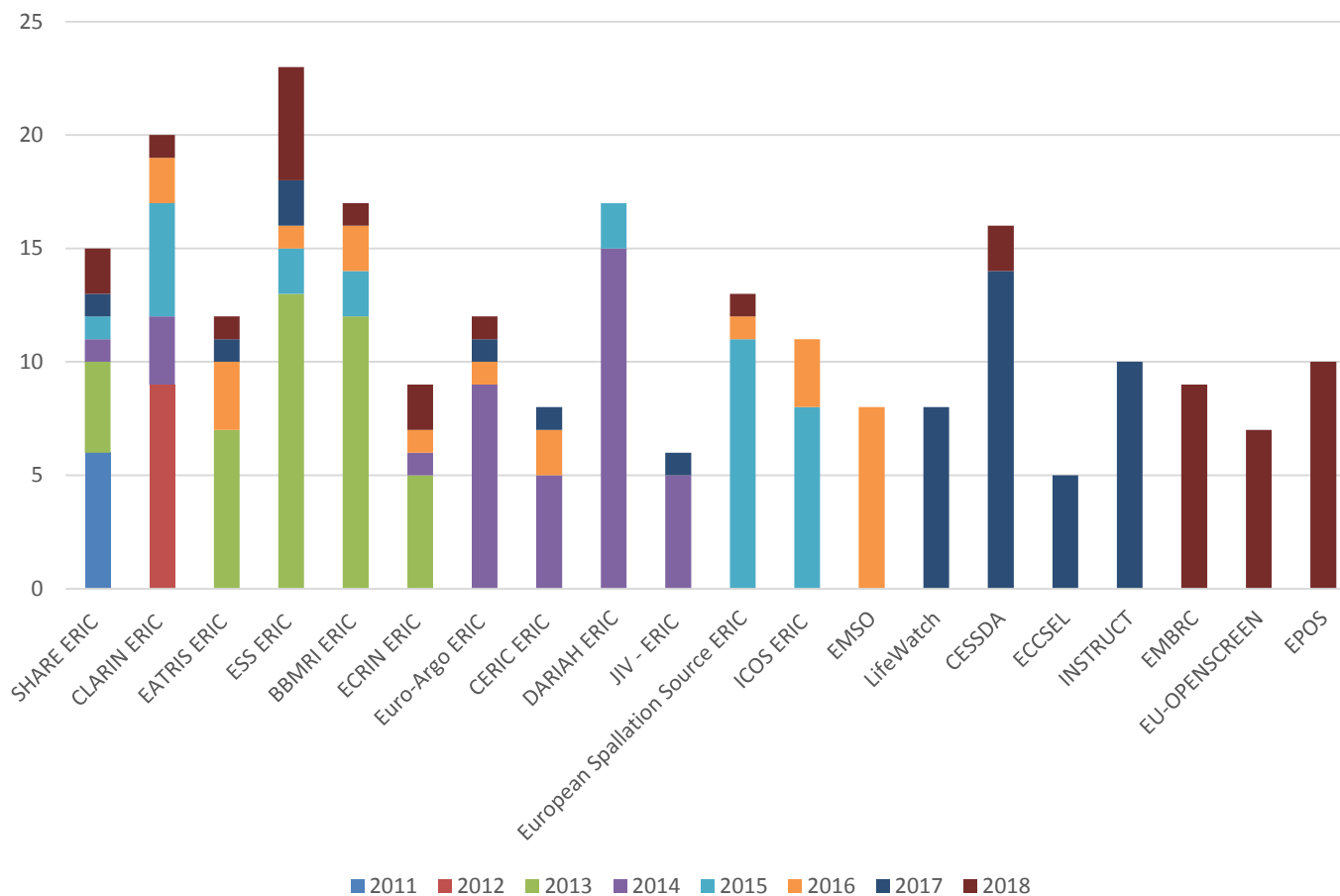
## ERIC Implementation (2/3)

- 2014 Euro-Argo(European contribution to the international Argo Programme)(FR), CERIC (Central European Research Infrastructure Consortium)(IT), DARIAH (Digital Research Infrastructure for the Arts and Humanities)(FR), JIV (Joint Institute for Very Long Baseline Interferometry)(NL)
- 2015 European Spallation Source(SE), ICOS (Integrated Carbon Observation System)(FI)
- 2016 European Multidisciplinary Seafloor and Water Column Observatory EMSO (IT)
- 2017 LifeWatch (ES), CESSDA (NO) and ECCSEL (NO), INSTRUCT (UK)

# ERIC Implementation (3/3)

- 2018 EMBRC – European Marine Biological Centre (FR), EU-OPENSSCREEN – European Infrastructure of Open Screening Platforms for Chemical Biology (DE)- EPOS – European Plate Observing System (IT)

# ERICs' Membership increases\*



\* Observers not included in the graphic

# ERICs' Membership

Established ERICs	Host country	Members	Observers
SHARE ERIC	DE	AT, BE, CZ, NL, IT, EL, IL, SI, SE, PL, FR, HU, CY, HR	CH
CLARIN ERIC	NL	CZ, DK, DE, EE, BG, AT, PL, LT, SE, PT, FI, EL, NO, SI, IT, LV, DLU, HU, HR	UK, FR
EATRIS ERIC	NL	CZ, FR, EE, IT, FI, NO, SI, LU, SE, ES, PT	LV
ESS ERIC	UK	AT, BE, CZ, EE, DE, IE, LT, NL, PL, PT, SI, SE, FR, HU, NO, IT, FI, LV, IS, CY, SK, BG	CH
BBMRI ERIC	AT	BE, CZ, DE, EE, EL, FR, IT, MT, NL, FI, SE, NO, UK, PL, LV, BG	CY, CH, TR, WHO/IARC
ECRIN ERIC	FR	DE, HU, ES, IT, PT, CZ, NO, IE	CH
Euro-Argo ERIC	FR	DE, UK, IT, NL, EL, FI, IE, ES, BG	NO, PL
CERIC ERIC	IT	CZ, AT, RO, SI, PL, HU, HR	RS
DARIAH ERIC	FR	AT, BE, HR, CY, DK, DE, EL, IE, IT, LU, MT, NL, RS, SI, PL, PT	
JIV - ERIC	NL	UK, SE, FR, ES, LV	
European Spallation Source ERIC	SE	CZ, DK, EE, FR, DE, HU, IT, NO, PL, CH, UK, ES	BE, NL
ICOS ERIC	FI	BE, DE, FR, IT, NL, NO, SE, CZ, DK, UK	CH
EMSO ERIC	IT	IE, EL, ES, FR, PT, RO, UK	
LifeWatch ERIC	ES	BE, IT, EL, NL, PT, RO, SI	
CESSDA ERIC	NO	AT, BE, CZ, DK, FR, DE, EL, HU, NL, SK, SI, SE, UK, FI, PT	CH
ECCSEL ERIC	NO	FR, IT, NL, UK	
INSTRUCT ERIC	UK	BE, CZ, DK, FR, IL, IT, NL, PT, SK	EL, ES, SE, EMBL
EMBRC ERIC	FR	BE, EL, IL, IT, NO, PT, ES, UK	
EU-OPENSOURCE ERIC	DE	CZ, FI, LV, NO, PL, ES	
EPOS ERIC	IT	BE, DK, FR, NL, NO, PT, SI, UK, PL	HE, IS, CH

# Further information

- <https://ec.europa.eu/research/infrastructures/?pg=eric>
- <https://publications.europa.eu/en/publication-detail/-/publication/c6647f05-874e-4cdd-af70-22ade4759930/language-en>
- <https://www.esfri.eu/>



Thank you for your attention

# HORIZON 2020



**EC Website** <http://ec.europa.eu/research/infrastructures/index.cfm>

*Landscape & Infrastructures providing access; ESFRI process; European Research Infrastructure Consortium; GSO, etc.*

**RICH** – National contact points network: <http://www.rich2020.eu/>