ESFRI

European Strategy Forum
on Research Infrastructures

ESFRI Roadmap 2018 on Research Infrastructures

Improving access to Europe's Research and innovation infrastructure

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Outline

- ESFRI 2018 roadmap: projects and landmarks
- Two main forms of RI-Industry interactions
  - As a supplier – the upstream business model
  - As a user – the downstream business model
- Research data for innovation

European Strategy Forum on Research Infrastructures (ESFRI)

- Mandated by the Competitiveness Council of the European Union
- Periodically updates the pan-European RI Roadmap
- A coherent and strategic vision ensuring that Europe has excellent Research Infrastructures (RIs) in all fields of science and innovation

ESFRI PROJECTS

	NAME	FULL NAME	TYPE	LEGAL STATUS (Y)	ROADMAP ENTRY (Y)	OPERATION START (Y)	CONSTRUCTION COSTS (M€)	OPERATION COSTS (M€/Y)
ENERGY	EU-SOLARIS	European Solar Research Infrastructure for Concentrated Solar Power	distributed		2010	2020*	6	0.2
	IFMIF-DONES	International Fusion Materials Irradiation Facility - DEMO Oriented NEutron Source	single-sited		2018	2029*	420	50
	MYRRHA	Multi-purpose hYbrid Research Reactor for High-tech Applications	single-sited		2010	2027*	1.352	74
	WindScanner	European WindScanner Facility	distributed		2010	2021*	6.1	2
ENVIRONMENT	ACTRIS	Aerosols, Clouds and Trace gases Research Infrastructure	distributed		2016	2025*	190	50
	DANUBIUS-RI	International Centre for Advanced Studies on River-Sea Systems	distributed		2016	2022*	222	28
	DISSCo	Distributed System of Scientific Collections	distributed		2018	2025*	69.4	12.1
	eLTER	Integrated European Long-Term Ecosystem, critical zone and socio-ecological system Research Infrastructure	distributed		2018	2026*	94	35
HEALTH & FOOD	AnaEE	Infrastructure for Analysis and Experimentation on Ecosystems	distributed	ERIC Step1, 2018	2010	2019*	1.1	0.8
	EMPHASIS	European Infrastructure for Multi-scale Plant Phenomics and Simulation	distributed		2016	2021*	73	3.6
	EU-IBISBA	Industrial Biotechnology Innovation and Synthetic Biology Accelerator	distributed		2018	2025*	11	65.1
	ISBE	Infrastructure for System Biology Europe	distributed		2010	2019*	10	5.2
	METROFOOD-RI	Infrastructure for promoting Metrology in Food and Nutrition	distributed		2018	2019*	78.8	31
	MIRRI	Microbial Resource Research Infrastructure	distributed		2010	2021*	0.8	0.7
PHYSICAL SCIENCES & ENGINEERING	EST	European Solar Telescope	single-sited		2016	2029*	200	12
	KM3NeT 2.0	KM3 Neutrino Telescope 2.0	distributed		2016	2020*	151	3
SOCIAL & CULTURAL INNOVATION	E-RIHS	European Research Infrastructure for Heritage Science	distributed		2016	2025*	20	5
	EHRI	European Holocaust Research Infrastructure	distributed		2018	2022*	0.8	2
DIGIT								

NA=Not Available

*expected

ESFRI LANDMARKS

NAME	FULL NAME	TYPE	LEGAL STATUS (Y)	ROADMAP ENTRY (Y)	OPERATION START (Y)	CAPITAL VALUE (M€)	OPERATION COSTS (M€/Y)
ECCSEL ERIC	European Carbon Dioxide Capture and Storage Laboratory Infrastructure	distributed	ERIC, 2017	2008	2016	1.000	0.85
JHR	Jules Horowitz Reactor	single-sited		2006	2022*	1.800	NA
EISCAT_3D	Next generation European Incoherent Scatter radar system	single-sited	EISCAT Scientific Association, 1975	2008	2022*	123	5.1
EMSO ERIC	European Multidisciplinary Seafloor and water-column Observatory	distributed	ERIC, 2016	2006	2016	100	20
EPOS	European Plate Observing System	distributed	ERIC Step2, 2018	2008	2020*	500	18
EURO-ARGO ERIC	European contribution to the international Argo Programme	distributed	ERIC, 2014	2006	2014	10	8
IAGOS	In-service Aircraft for a Global Observing System	distributed	AISBL, 2014	2006	2014	9.2	7
ICOS ERIC	Integrated Carbon Observation System	distributed	ERIC, 2015	2006	2016	116	24.2
LifeWatch ERIC	e-Infrastructure for Biodiversity and Ecosystem Research	distributed	ERIC, 2017	2006	2017	150	12
BBMRI ERIC	Biobanking and BioMolecular Resources Research Infrastructure	distributed	ERIC, 2013	2006	2014	195	3.5
EATRIS ERIC	European Advanced Translational Research Infrastructure in Medicine	distributed	ERIC, 2013	2006	2013	500	2.5
ECRIN ERIC	European Clinical Research Infrastructure Network	distributed	ERIC, 2013	2006	2014	5	5
ELIXIR	A distributed infrastructure for life-science information	distributed	ELIXIR Consortium Agreement, 2013	2006	2014	125	95
EMBRC ERIC	European Marine Biological Resource Centre	distributed	ERIC, 2018	2008	2017	164.4	11.2
ERINHA	European Research Infrastructure on Highly Pathogenic Agents	distributed	AISBL, 2017	2008	2018	5.8	0.7
EU-OPENSCREEN ERIC	European Infrastructure of Open Screening Platforms for Chemical Biology	distributed	ERIC, 2018	2008	2019*	82.3	1.2
Euro-BioImaging	European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences	distributed	ERIC Step2, 2018	2008	2016	90	1.6
INFRAFRONTIER	European Research Infrastructure for the generation, phenotyping, archiving and distribution of mouse disease models	distributed	GmbH, 2013	2006	2013	180	80
INSTRUCT ERIC	Integrated Structural Biology Infrastructure	distributed	ERIC, 2017	2006	2017	400	30
CTA	Cherenkov Telescope Array	single-sited	gGmbH, 2014	2008	2024*	400	20
ELI	Extreme Light Infrastructure	distributed	AISBL, 2013	2006	2018	850	80
ELT	Extremely Large Telescope	single-sited	ESO#	2006	2024*	1.120	45
EMFL	European Magnetic Field Laboratory	distributed	AISBL, 2015	2008	2014	170	20
ESRF EBS	European Synchrotron Radiation Facility Extremely Brilliant Source	single-sited	ESRF#	2016	2023*	128	82
European Spallation Source ERIC	European Spallation Source	single-sited	ERIC, 2015	2006	2025*	1.843	140
European XFEL	European X-Ray Free-Electron Laser Facility	single-sited	European XFEL#	2006	2017	1.490	118
FAIR	Facility for Antiproton and Ion Research	single-sited	GmbH, 2010	2006	2025*	NA	234
HL-LHC	High-Luminosity Large Hadron Collider	single-sited	CERN#	2016	2026*	1.408	136
ILL	Institut Max von Laue-Paul Langevin	single-sited	ILL#	2006	2020*	188	97
SKA	Square Kilometre Array	single-sited		2006	2027*	1.000	77
SPIRAL2	Système de Production d'Ions Radioactifs en Ligne de 2e génération	single-sited	GANIL	2006	2019*	281	6
CESSDA ERIC	Consortium of European Social Science Data Archives	distributed	ERIC, 2017	2006	2013	117	39
CLARIN ERIC	Common Language Resources and Technology Infrastructure	distributed	ERIC, 2012	2006	2012	NA	14
DARIAH ERIC	Digital Research Infrastructure for the Arts and Humanities	distributed	ERIC, 2014	2006	2019*	NA	0.7
ESS ERIC	European Social Survey	distributed	ERIC, 2013	2006	2013	NA	2.5
SHARE ERIC	Survey of Health, Ageing and Retirement in Europe	distributed	ERIC, 2011	2006	2011	250	18
PRACE	Partnership for Advanced Computing in Europe	distributed	AISBL, 2010	2006	2010	500	60

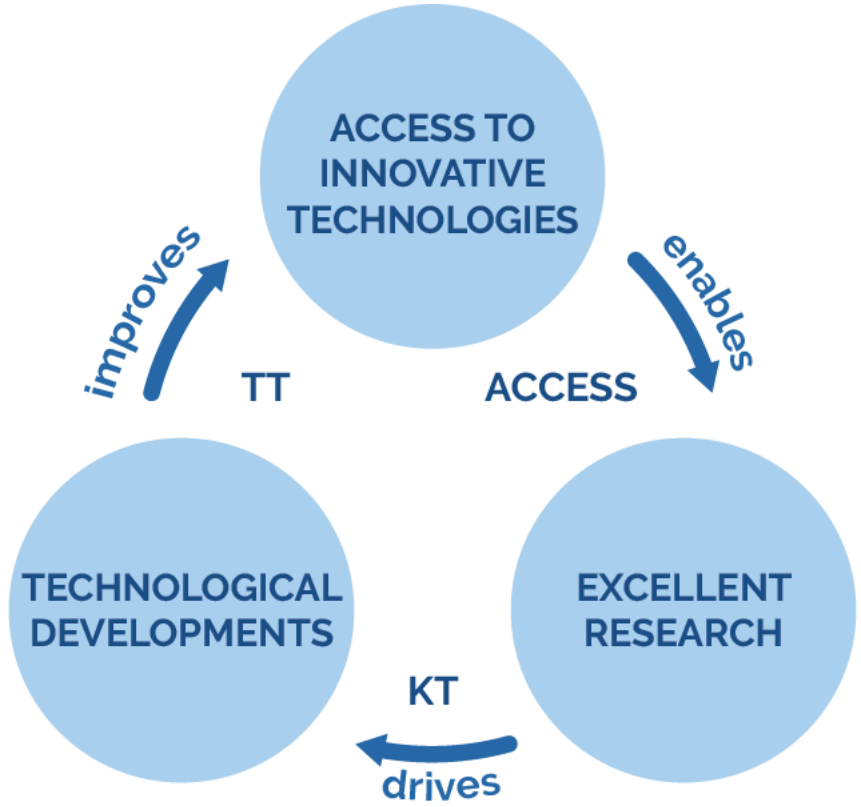
NA=Not Available

*expected

EIROforum member

Opening remarks

- Open Innovation
- Co-creation and co-development
- Technology & Knowledge transfer



The virtual circle of innovation

Forms of RI-industry interactions

As a supplier – the upstream business model

Technology transfer

- Industry as a provider of state of the art technologies, new designs, components, software (RI construction and major upgrade stages)

- “Co-solution”: scientific and industrial partners develop solutions on shared problems (technology transfer)

- **Challenge:** Awareness – as early as possible – on RI opportunities and offerings for industry

Upstream - Regulatory and financial issues

- Simplify and harmonize **public procurement** procedures and rules in all EU Members States
- Consider the **worldwide markets** for selection of suppliers
- Explore the EU SME instrument or the “Fast Track to Innovation” to involve SMEs (as done in USA)
- Revisit regulatory requirements related to the granting of State Aid with regard to RIs (new RDI State Aid Framework)

As a user - the downstream business model

Knowledge transfer

- Industry uses RIs for
  - early stage basic research and more applied industrial research and for testing innovative developments and products.
  - training and mobility within the framework of exchange programmes

- **Challenges:** costs, co-property

Downstream – Costs

- Costs: “the more academic is your project, the less access cost you have to pay”
  - pure academic research (free of charges)
  - industry-academic (industry-focused) research
  - programme-based cooperative research groups (industry-driven or not)
  - proprietary research (at full cost)
- *Full cost is < 5% of the total available user access time, 20% rest*
- Need to calculate cost prices of all expenses linked to access early on

Downstream – IPR - the Grey zone

- Industrial and scientific users of RIs have usually very different needs in joint research projects which may create conflicts of interests
- IPR, “co-property” and publishing regimes are key for cooperation
  - Industry's IPRs protected as an incentive for industry to invest in research cooperation and to commercialize the results when possible
  - Inventions created by RIs stuff protected for commercialization (spin-offs)
- Need clear rules from the beginning by regulation in contracts (e.g., licensing, patents, NDAs)

Innovation potential in research data (downstream)

A great impact on innovation is also expected from the openness of well documented high-quality research data supported by reliable and effective data services.

Policies for research data

- Open Science / open data as a means to spur innovation
- Open Science and FAIR data is EU's flagship initiative and all RIs are called to implement it through a tight roadmap
  - European Open Science Cloud (EOSC)

- **Challenge:** "chain of fairness and confidence" must be developed in a truly transparent approach to allow proper data use by industry

Policies for research data

- **Proper data citation.** Competition between RIs and SMEs for delivery of value added data products that are essential to RI sustainability
  - Effective IT solutions for data traceability and user accountability is mandatory in order to fully exploit open science and interact with private stakeholders

- **Not all data is free.** Pricing for commercial use of data, requiring the definition of data policy for commercial use and re-use of data

How to strengthen access and collaboration

- Operate RI **Industrial Liaison Office**
  - Raise awareness on needs on the supply demand side
  - Act as a broker for re-use and repurposing of data
  - New types of experts capable to extract and valorise research data for industrial, economical and societal needs
- Turn RI data offering into **Industrial Data Platforms**
  - Regulate data governance: guarantee data quality, security, privacy
  - Perform brokerage services and agreements
  - Develop shared APIs
- Develop **Quality stamp** on RI nodes (e.g. Elixir national nodes)

Resources

ESFRI 2018 Roadmap

https://roadmap2018.esfri.eu

ESFRI Scripta Volume III: Innovation-oriented cooperation of Research Infrastructures

https://www.esfri.eu/sites/default/files/u4/ESFRI_SCRIPTA_VOL3_INNO_double_page_2.pdf

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Thank you

Improving access to Europe's Research and innovation infrastructure

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