



# Developing Research Infrastructures for 2020 and beyond

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*(The views expressed in this presentation are those of the author and do not necessarily reflect the views of the European Commission)*

# Research Infrastructures

Research infrastructures are **facilities, resources, organisational systems and services** that are used by the research communities to conduct research and foster innovation

Research infrastructures include:

- **Major scientific equipment** (or sets of instruments)
- **Knowledge-based resources** such as collections, archives or scientific data
- **E-infrastructures**, such as data, computing, and software systems, communication networks and systems to promote openness and digital trust
- **Any other infrastructure** of a unique nature essential to achieve excellence in research and innovation

Research infrastructures may be

- **'single-sited'** (a single resource at a single location)
- **'distributed'** (a network of distributed resources)
- or **'virtual'** (the service is provided electronically)

# Why an EU approach for Research Infrastructures?

- To address collectively the **complexity and cost of the design and development** of new world class 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 develop and operate research infrastructures **globally**



# 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 28 Member States, 10 Associated States**, and of the **European Commission**
- To support the development of a **European policy for Research Infrastructure** and discuss a **long term vision** at European level
- To facilitate **multilateral initiatives** leading to the better use and development of Research Infrastructures, at EU and international level

# ESFRI – The Roadmap mandate



- Mandated by the EU Council of Research Ministers of November 2004 to develop a **strategic roadmap in the field of Research Infrastructures for Europe**
- The ESFRI roadmap identifies **new pan-European Research Infrastructures or major up-grades 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

## ESFRI - Constructing new RIs

- The **Innovation Union** includes a commitment to complete or launch construction by 2015 of **60% of the ESFRI roadmap priority Ris**
- The challenges are to overcome **obstacles** and ensure **national commitments** to the construction and operation of the new RI and ensure **open access** for researchers to Ris across Europe
- The potential of financial instruments such as the **Risk Sharing Finance Facility** (RSFF) of the European Investment Bank and the **Structural Funds** are being explored for complementing the regional, national or European funds for the implementation of these projects

# Examples of Networks of RIs with TPT dimension funded under FP7

- **EUFAR** aims to integrate the airborne community, to ensure that researchers may have access to the infrastructure most suited to their needs, irrespective of the location of the infrastructure (<http://www.eufar.net/>)
- **COPAL** (ex-EUFAR) has the objective of providing the European scientific community with a unique research aircraft platform, capable of reaching and operating in any remote area in the world and offering a heavy-payload for integration of a large panoply of instruments for research in environmental and GEO-sciences (<http://www.eufar.net/wiki/pmwiki/pmwiki.php/CopalCMS/COPALPresentation?skin=copal>)

## Examples of Networks of RIs with TPT dimension funded under FP7 (2)

- **ESWIRP** brings together wind tunnel facilities across Europe to optimise research infrastructures and improve their performance (<http://www.eswirp.eu/>)
- **IAGOS** is setting up a network of commercial aircraft that will carry out observations of atmospheric composition on a scale that would be impossible to achieve using research aircraft (<http://www.iagos.org/>)



# Examples of transport projects with RI dimension funded under FP7

- **ASPECSS** – Assessment methodologies for forward looking integrated pedestrian and further extension to cyclists safety systems (<http://www.aspecss-project.eu/>)
- **EUREMCO** – European railway electromagnetic compatibility (<http://www.euremco.eu/>)
- **HERMES** – Establishing a comprehensive transport research information management and exchange system (<http://www.hermes-project.net/>)

## Examples of transport projects with RI dimension funded under FP7 (2)

- **SANDRA** – Seamless aeronautical networking through integration of data links, radios and antennas (<http://sandra.aero/2013/>)
- **SARTRE** – Safe road trains for the environment (<http://www.sartre-project.eu/en/sidor/default.aspx>)
- **TARGETS** – Targeted advanced research for global efficiency of transportation shipping (<http://www.targets-project.eu/>)
- **DETRA** – Developing a European transport research alliance (<http://detra.fehrl.org/>)

# From FP7 to Horizon 2020

- More **focused support** to the implementation and operation of world-class infrastructures such as ESFRI infrastructures
- Broader **access** to and deeper **integration** of European research infrastructures
- Foster the **innovation potential** of research infrastructures
- Widen the **participation** to pan-European research infrastructures
- More support to **e-infrastructures**
- Reinforce **policy support** to European strategy on research infrastructures
- Develop **international dimension** of the actions

# Horizon 2020 – Framework Programme for Research and Innovation (2014-2020)

## Excellent science

- European Research Council
- Future and Emerging Technologies
- Marie Curie actions
- **European Research infrastructures (including e-infrastructures) – 2.382 M€**

## Societal challenges

- Health, demographic change, 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

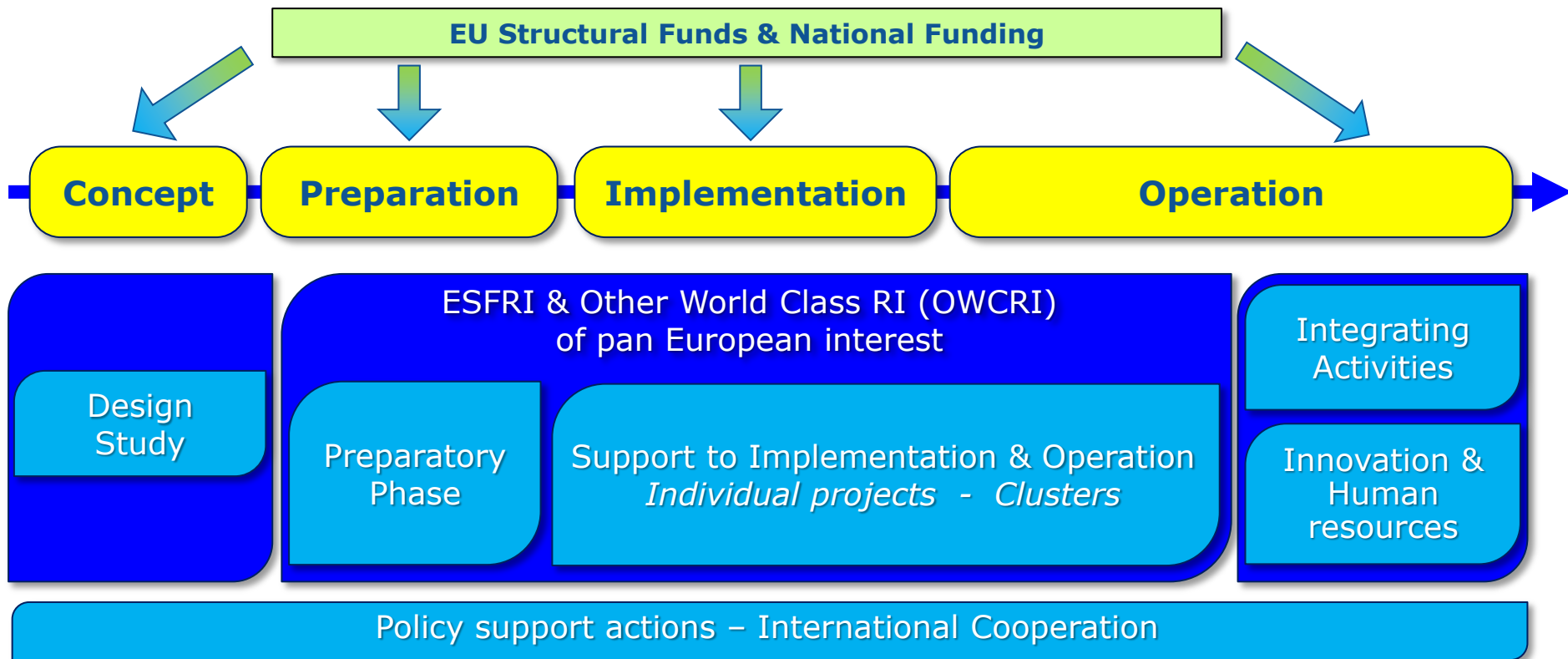
## Industrial leadership

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

# Research Infrastructures in Horizon 2020

- The specific objective is to endow Europe with **world-class research infrastructures** which are accessible to all researchers in Europe and beyond and fully exploit their potential for scientific advance and innovation
- **Broad lines of the activities**
  - ✓ Developing the European **RIs for 2020 and beyond**
  - ✓ Fostering the **innovation potential** of RIs and their **human resources**
  - ✓ Reinforcing European **RI policy** and **international cooperation**

# A Coherent Toolbox of Activities



# 1. Developing the European research infrastructures for 2020 and beyond

- **The aims shall be to facilitate and support**
  - ✓ The **preparation, implementation** and **operation** of the ESFRI and other world-class research infrastructures, including their development of regional partner facilities, when there exists a strong added value for Union intervention
  - ✓ The **integration** of and **access** to national research infrastructures of pan-European and regional interest, so that European scientists can use them, irrespective of their location, to conduct top-level research
  - ✓ The **development, deployment** and **operation** of e-infrastructures

## ➤ The Union funding will contribute to

- ✓ The **preparatory phase** of future infrastructures (e.g. detailed construction plans, legal arrangements, multiannual planning, early engagement of industry)
- ✓ The **implementation phase** (e.g. R&D and engineering work jointly with industry and users, development of regional partner facilities aiming at a more balanced development of the European Research Area)
- ✓ The **operation phase** (e.g. access, data handling, outreach, training and international cooperation activities)
- ✓ (This activity will also support **design studies** for new research infrastructures through a bottom-up approach)



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

- The aims shall be to encourage research infrastructures to act as **early adopters of technology**, to promote R&D **partnerships with industry**, to facilitate **industrial use** of research infrastructures and to stimulate the **creation of innovation clusters**
- This activity shall also support **training and/or exchanges of staff** managing and operating research infrastructures

## 3. Reinforcing European RI policy and international cooperation

- Reinforcing European policy for research infrastructures
  - ✓ The aim shall be to support **partnerships between relevant policymakers and funding bodies**, mapping and monitoring tools for decision-making and also international cooperation activities
- Facilitate strategic **international cooperation**
  - ✓ The aim is to facilitate the development of **global research infrastructures** i.e. research infrastructures that require funding and agreements on a global scale
  - ✓ The aim is also to facilitate the **cooperation of European research infrastructures with their non-European counterparts**, ensuring their global interoperability and reach, and to pursue international agreements on the reciprocal use, openness or co-financing of infrastructures

# **(Draft) Work programme 2014-2015**

## **European research infrastructures (including e-Infrastructures)**

- **Call 2 - Integrating and opening research infrastructures of pan-European interest**
  - ✓ **INFRAIA 1-2014/2015:** Integrating and opening existing national and regional research infrastructures of pan-European interest
  - ✓ **Large-scale testing facilities for engineering applications** - This activity aims at improving and providing access to the European research infrastructures such as wind tunnels and other industrial test benches for transport and particularly for aeronautics, including support for developing future norms for public transportation and safety



# **(Draft) Work programme 2014-2015**

## **European research infrastructures (including e-Infrastructures)**

- **Call 4 - Support to Innovation, Human resources, Policy and International cooperation**
  - ✓ **INFRASUPP 6-2014** – International cooperation for research infrastructures
  - ✓ The research infrastructures action will focus on a number of key third countries seen as strategic for the development, exploitation and management of world-class research infrastructures

# RI recommendations Horizon 2020 - Aeronautics

- **Wind tunnels**
- **Other R&I capabilities**
  - ✓ Propulsion
  - ✓ Air Traffic Management
  - ✓ Large scale demonstrator aircraft
  - ✓ Production technology
  - ✓ E-infrastructure
  - ✓ Environmental research

# RI recommendations Horizon 2020 - Surface Transport

- **Automotive**
  - ✓ Test track facilities, crash testing, emission testing, windtunnels
- **Marine**
  - ✓ Research vessels, ocean observation facilities, offshore platforms
- **Rail**
  - ✓ Test track facilities, crash testing
- **Waterborne**
  - ✓ Tank testing facilities

## More information

### **Research & Innovation – Infrastructures**

[http://ec.europa.eu/research/infrastructures/index\\_en.cfm](http://ec.europa.eu/research/infrastructures/index_en.cfm)

**Thank you for your Attention!**

HORIZON 2020

