

České předsednictví
Evropské unie

Czech Presidency
of the European Union

Présidence tchèque
de l'Union européenne

2009



ERA – Vision 2020 - April 2009 – Hervé PERO, EC

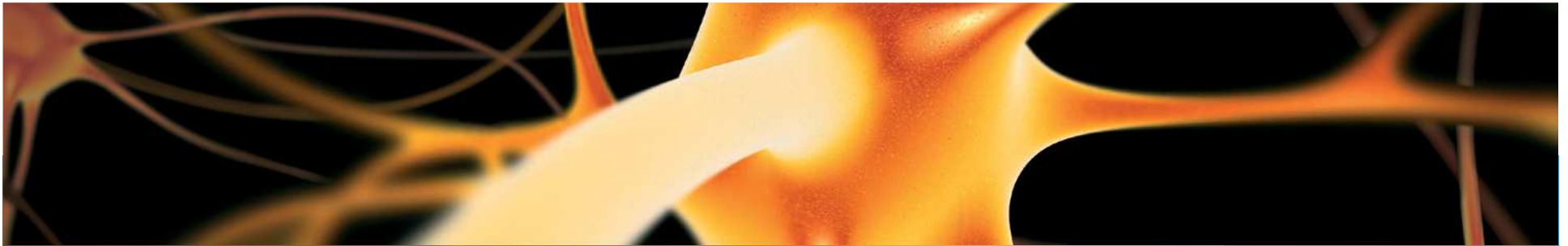
Utilizing the full Potential of Research
Infrastructures for Strengthening the ERA



Research Infrastructures (incl. e-infrastructures) are:

- High-level facilities, resources, and related services used by the scientific community for
 - Conducting leading-edge research
 - Knowledge transmission, knowledge exchanges and knowledge preservation
- Today Research Infrastructures include major scientific equipment, scientific collections, archives, structured information, ICT-based infrastructures





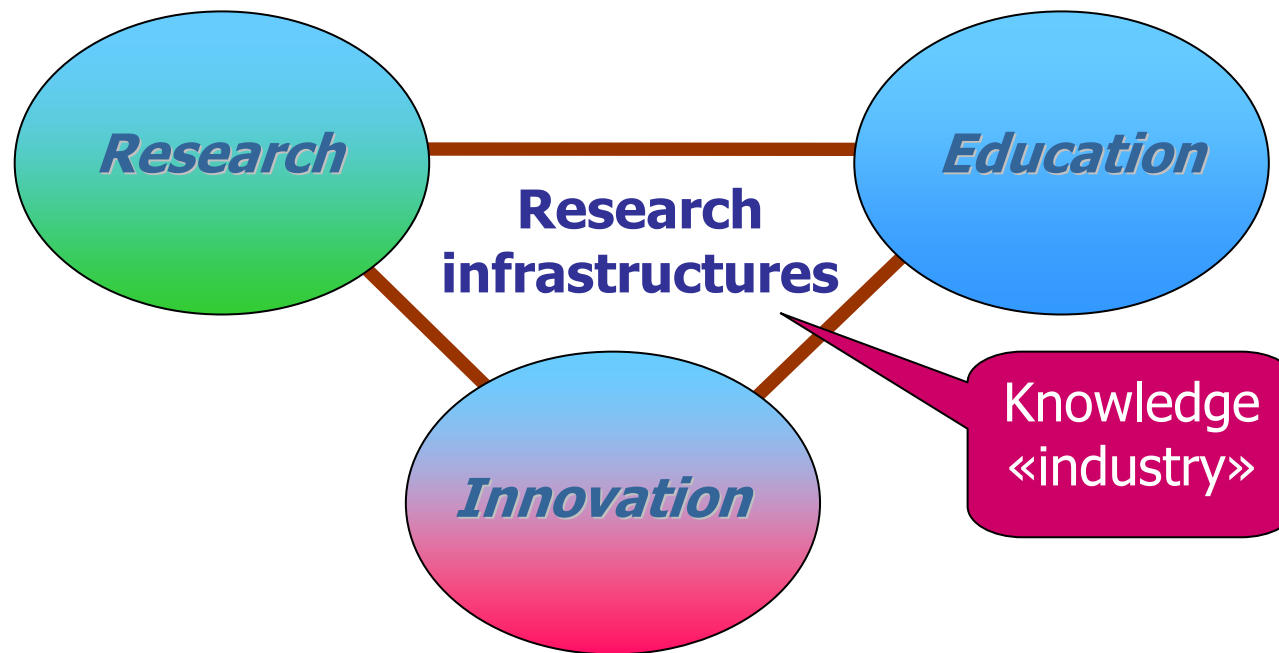


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**Research Infrastructures
are at centre of the knowledge triangle,**

**This is where basic research
as well as applied research are interacting**

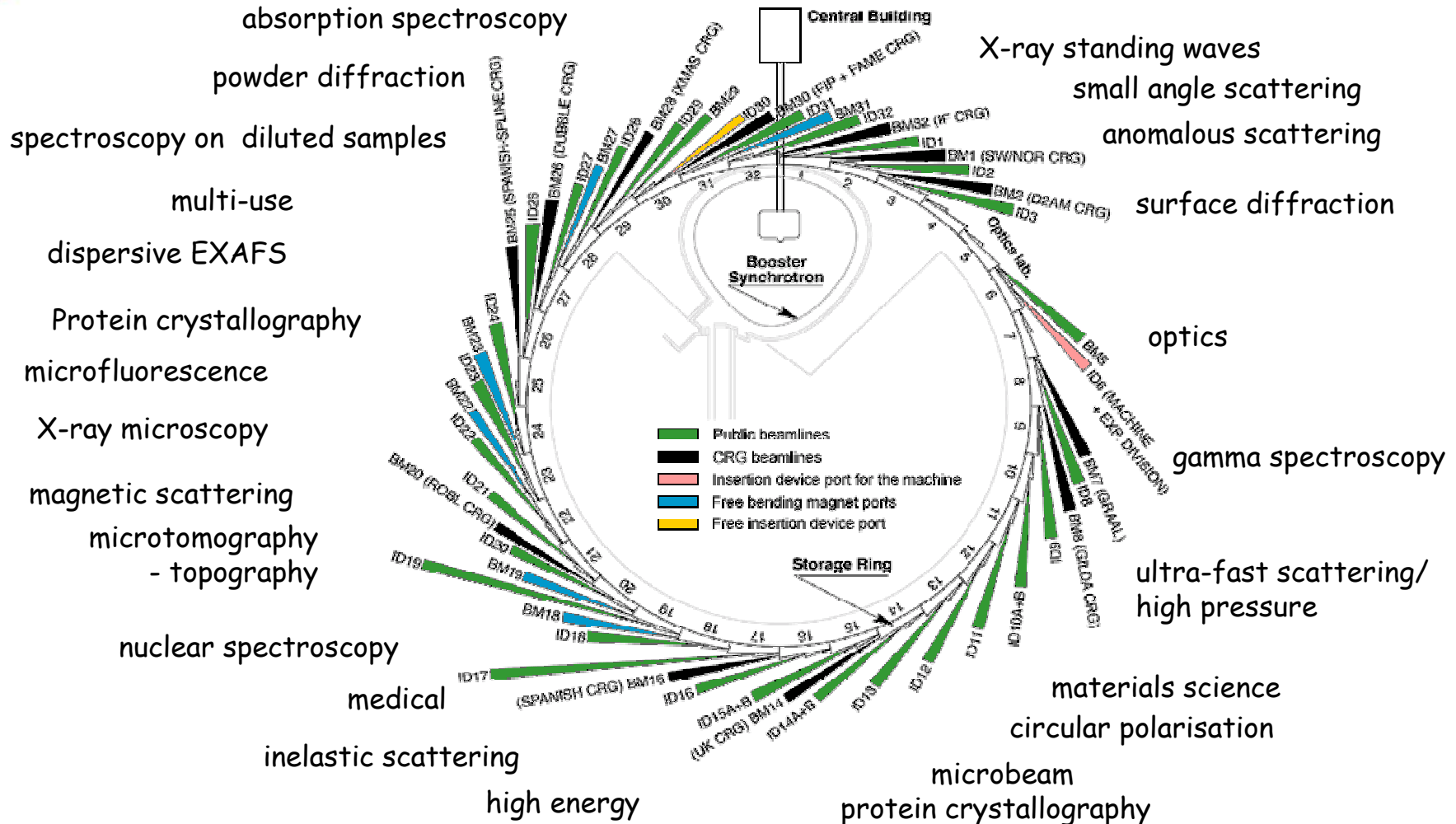




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Example of the ESRF Synchrotron offering rich opportunities for users





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Importance of a shared vision of ERA - with global dimension

Five initiatives in 2008

- a) Researchers
- b) Joint Programming
- c) Research infrastructures
- d) International S&T Cooperation
- e) Knowledge transfer and IP management

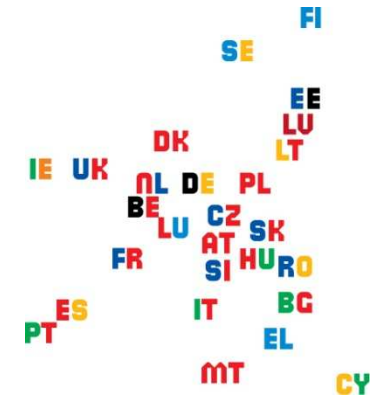
Towards the fifth freedom... the
freedom of knowledge within ERA





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- RIs not only at the root but also the future of Europe,
- Europe suffers from fragmentation,
- Therefore networking and integration is the way forward,
- More than half of the ESFRI facilities are of distributed nature, which gives opportunities for regions, small & less research intensive countries to participate in joint projects,

EU2009.CZ





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- Networking spirit is a European strength, but collaboration remains a challenge to be faced...
- The current situation is forcing Europe to quickly advance on research investments, which is twice virtuous (support to research + industry)
- A new way of managing research is emerging;
- this is a major challenge, not scientific but mainly political, possibly cultural...

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Towards an 'eco-system' of Research Infrastructures within ERA

- a) Large single-sited facilities
- b) Distributed European Facilities
- c) Regional Partner Facilities
- d) Network of national facilities
- e) Linked with universities & schools
- f) Network of industrial suppliers / users





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Today, scientific competition is at world level

- Is Europe able to face the challenge?
- Are member States willing to think European?

RI policy at EU level has no other choice than continuing reinforcing coordination

- At EU level,
- At national and regional,
- At “variable geometry”,
- At global level...

*This explains the important
role of ESFRI and others...*





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Role of ESFRI

Set up by the Council in 2002

Mission:

- To support a coherent and strategy-led approach to policy making on RIs in Europe
- To facilitate multilateral initiatives leading to a better use and development of RIs

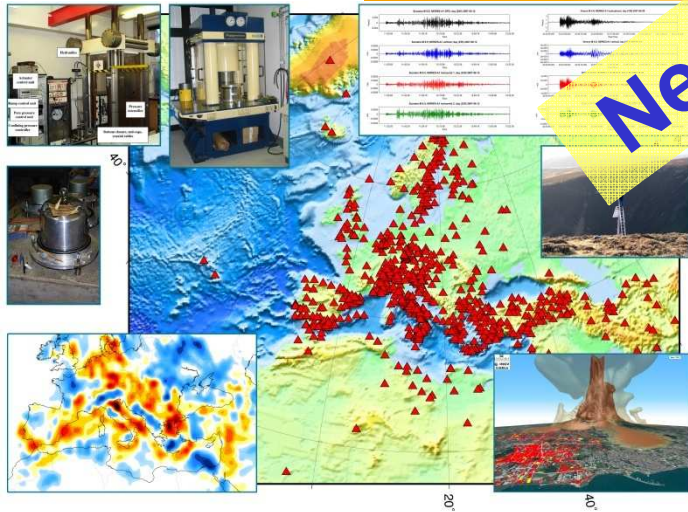
It brings together representatives of Ministers of the 27 Member States, of the 9 Associated States, and of the EU Commission

ESFRI

European Strategy Forum
on Research Infrastructures

EPOS

New 2008



Estimated construction cost	500 M€
First open access foreseen	2018

European Plate Observing System

- RI and e-science for Data and Observatories on Earthquakes, Volcanoes, Surface Dynamics and Tectonics;
- Integration of the highly advanced European facilities currently scattered;
- Promotion of innovative approaches for a better understanding of the physical processes controlling earthquakes, volcanic eruptions and tsunamis;

www.epos-eu.org



New 2008

EISCAT_3D

Estimated construction cost	60-250 M€
First open access foreseen	2013

- Next Generation European Incoherent Scatter Radar System***
- A world-class strategic resource located in the northern periphery, close to the important Barents Sea and sub polar icecap areas;
 - Will give unprecedented temporal/spatial information about plasma & space environment and accurate, large-scale, 3-dimensional measurements of the ionosphere and atmosphere for the first time;
 - Drives developments in radar technology and signal processing and supports European industry;

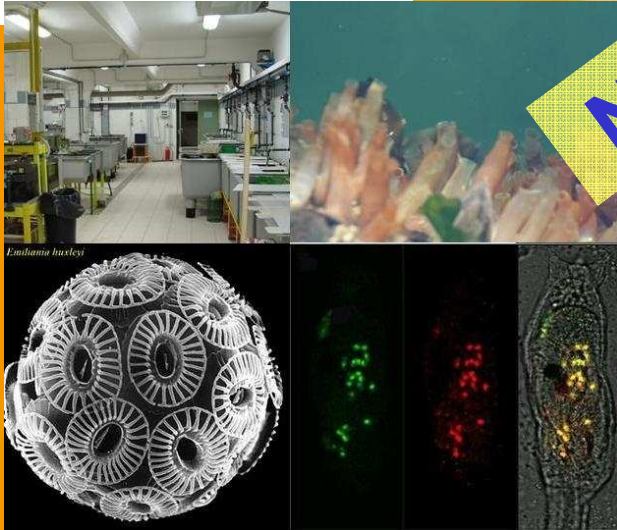
www.eiscat.se

Environmental Sciences



EMBRC

New 2008



Estimated construction cost	100 M€
First open access foreseen	2018

European Marine Biological Resource Centre

- Distributed infrastructure based on the main European marine stations
- To provide access to model marine organisms, their ecosystems, and genomic resources
- A as comprehensive as possible coverage of European Coastal ecosystems and resources

www.embrc.eu

EURO-BIOIMAGING



New 2008

Estimated construction cost	370 M€
First open access foreseen	2012

European Biomedical Imaging Infrastructure

- **Distributed infrastructure to provide access to imaging facilities and imaging technologies**
- **From advanced light microscopy to medical imaging, across the full scale of biological and medical applications**

www.eurobioimaging.eu

ECCSEL

New 2008



Estimated construction cost	81 M€
First open access foreseen	2011

European Carbon Dioxide Capture and Storage Laboratory Infrastructure

- Key technology for reducing emissions from fossil energy use
- Three approaches to CO₂ capture (pre and post combustion and O₂/CO₂ oxyfuel recycle combustion capture)
- and three approaches to storage combined (aquifers, depleted oil/gas fields, coal bed methane)

www.ntnu.no/eccsel



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Role of the Community Research Infrastructures actions

- Optimising the use and balanced development of the best **existing research infrastructures** in Europe
- Helping to create in all fields of S & T **new research infrastructures** of pan-European interest
 - e.g. Hyper, ELI, XFEL, BBMRI, EMSO, Share, etc.
- Supporting **policy development**
 - e.g. ESFRI, e-IRG, impact studies
 - international cooperation

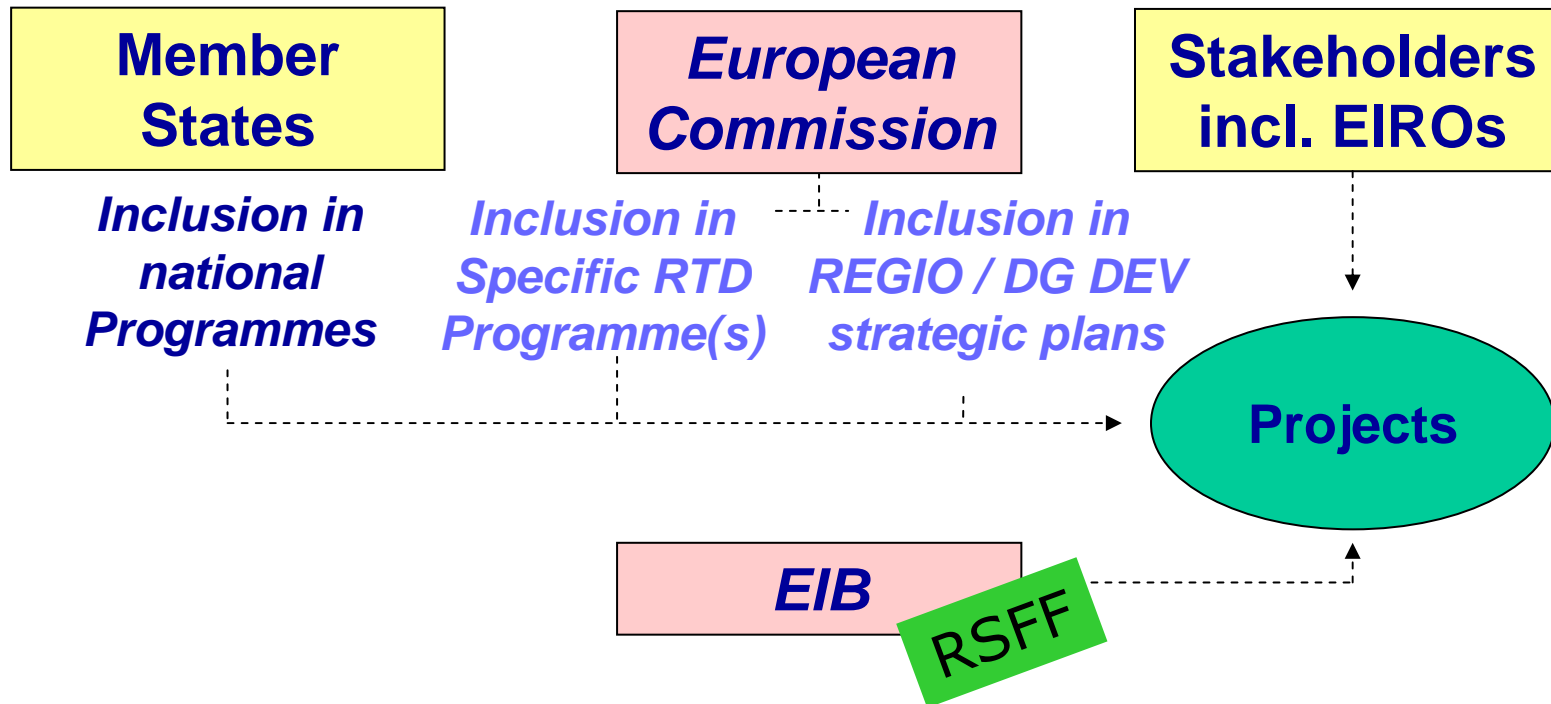
1,715 M€ for RIs for
the period 2007-2013



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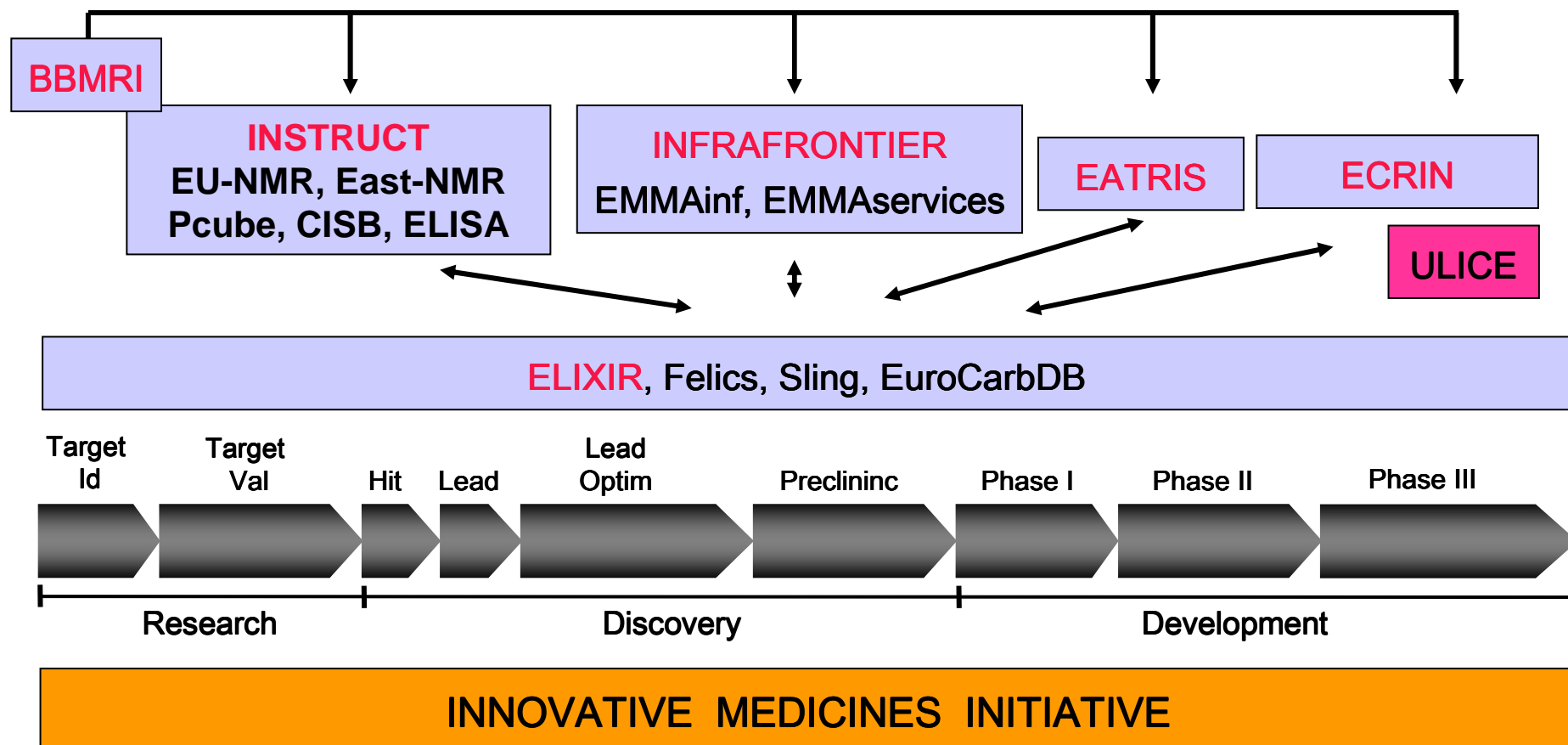
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Preparatory Phase facilitating financial engineering for new research infrastructures



34 of the 35 ESFRI projects supported

Example: Research Infrastructures in support of Cancer Research





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Integrating Activity in FP7

- Continuation of the FP6 instrument "I3"
- Collaboration of **existing research infrastructures**
 - Normally all major RI's in Europe in one field
- Three types of obligatory activities
 - *Networking Activities*
 - *Trans-national Access and/or Service Activities*
 - *Joint Research Activities*

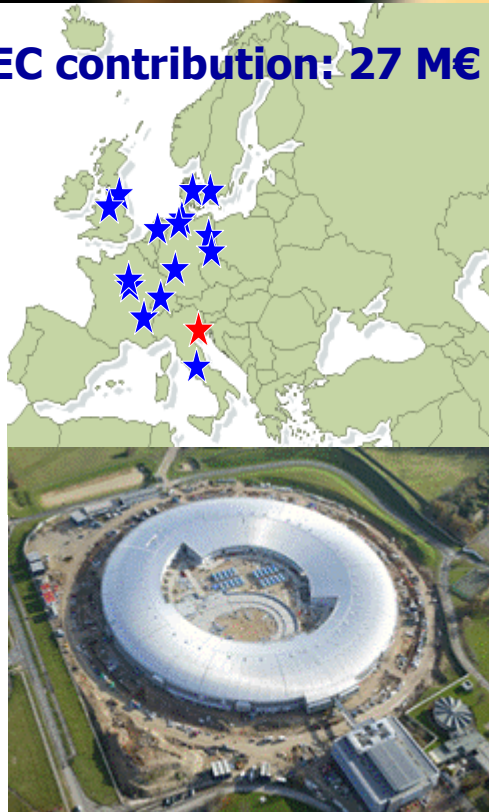
EC funds ~250 M€/y

2,5% of EU needs

About 300 RIs
supported under FP

Example: integrating actions for European Synchrotrons

EC contribution: 27 M€



Transnational Access (~19 M€):

- 15 installations, with 4000 users from a very broad spectrum of disciplines

Networking Activities (~2 M€):

- e.g. specialized workshops, conferences, schools (support areas of transnational cooperation)

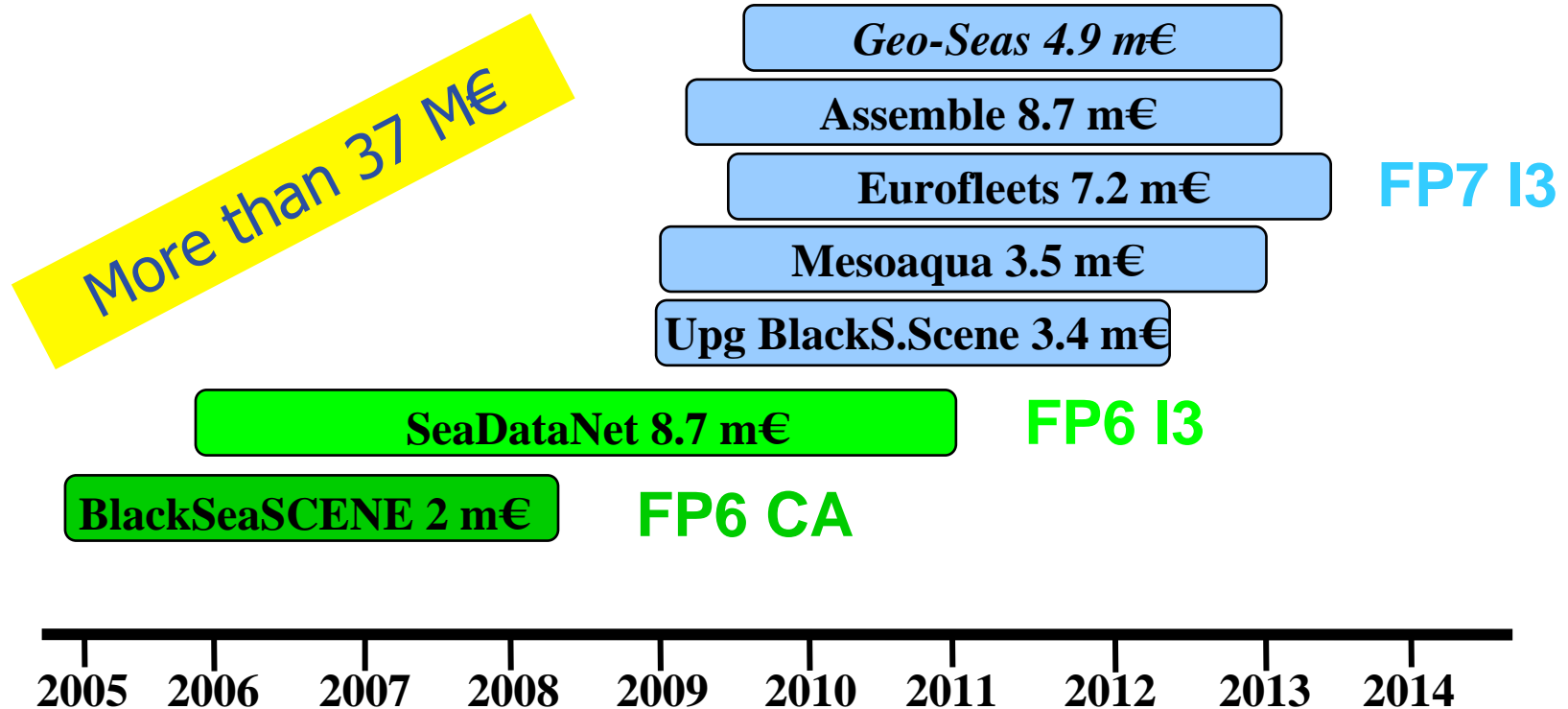
Joint Research Actions (~6 M€):

- e.g. setting up of a European platform for Protein Crystallography

See: <http://www.elettra.trieste.it/i3/>



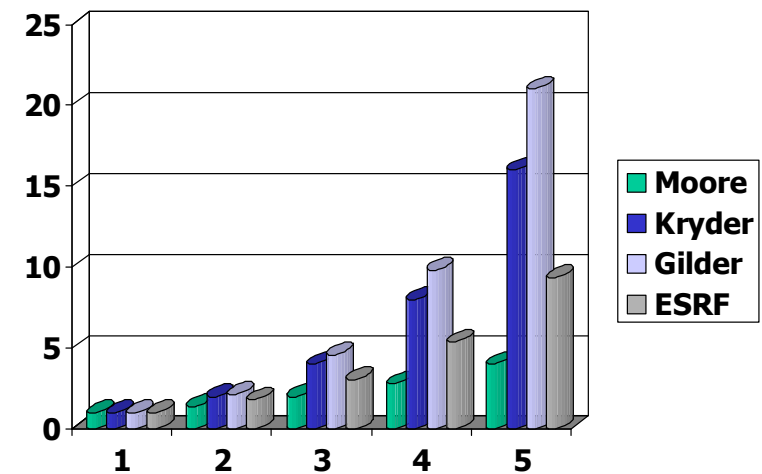
Example: Integrated RIs for Marine sciences FP6-FP7 projects



IT and data

- Moore's law: individual computers double processing power every **24 months**
- Kryder's law: disk storage capacity doubles every **13 months**
- Gilder's law: network bandwidth doubles every **9-12 months**
- ESRF: data production doubles every **15 months**

- This exponential growth profoundly changes the landscape of Information technology
- **High-speed** access to **networked information** becomes the dominant feature of future computing
- For large-scale data sets: secure remote access eventually becomes feasible

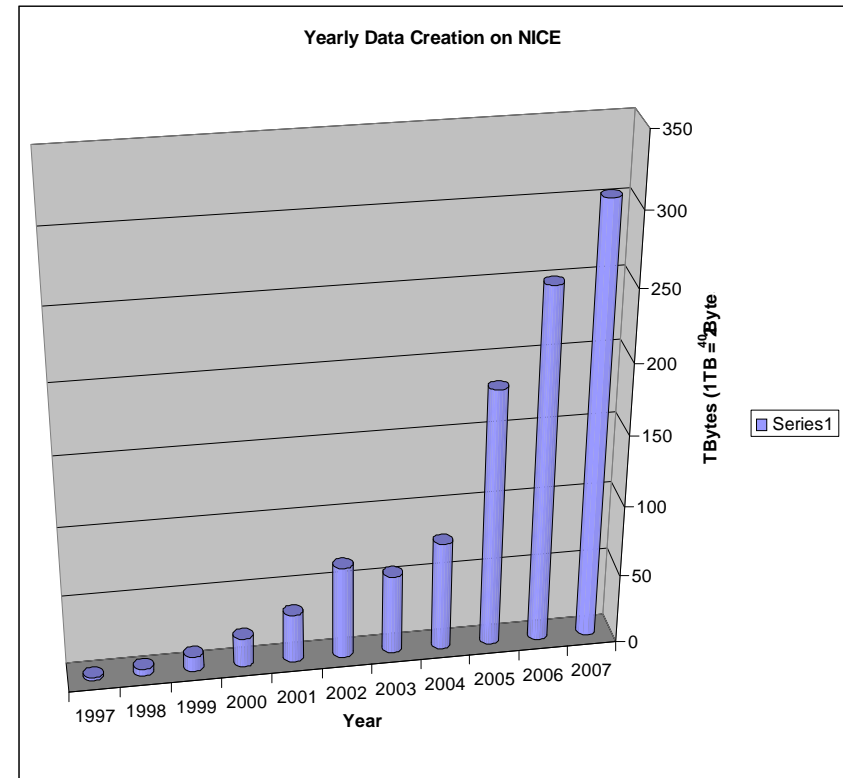


Source: ESRF - Dimper

Scientific data management is a particular challenge

Case of ESRF:

- 10 years \rightarrow data volume x 300.
In 2007: 300TB $\sim 1 \cdot 10^8$ files
- ESRF has doubled the data centre infrastructure (m², kW, cooling)
- Today: ~ 250 kW, ~ 300 m²





Status of ERA development since the green book?

- Prioritization
- More and better funding
- Legal framework
- Management and access
- E-infrastructures
- The global level
- Future Governance

Many national

Still difficulties to

EC proposal made

Need for common

Positive developments

Discussions at G8



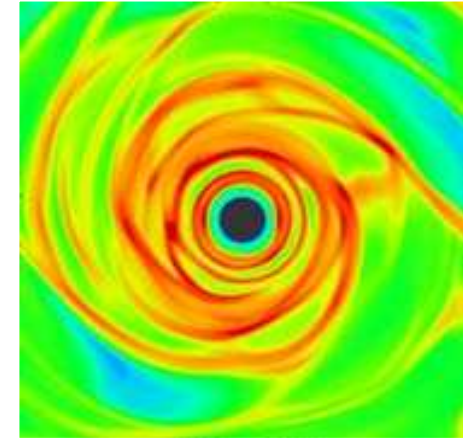


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How to identify facilities of pan-European interest?

The scientific approach...



- scientific Excellence (E)
 - Uniqueness of research services offered
 - Support to frontier research / knowledge creation
- efficiency of Implementation (M)
 - Procedure for selection of research projects
 - Quality of research services provided
- potential impacts (I)
 - Support for publications
 - Knowledge preservation, etc.





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Pan-European dimension of RIs



- Excellence (E)
 - Agreement with European S&T challenges
 - Excellence of training for EU researchers
- Implementation (M)
 - Supranational governance, advisory boards
 - Access and links with other facilities at int'l level
- potential Impacts (I)
 - Supporting European leadership
 - Added value at international level

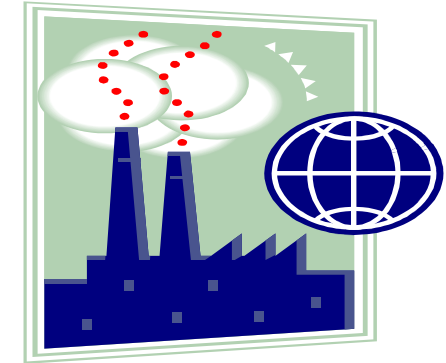




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Not to forget indicators linked with European development



- scientific Excellence (E)
 - Agreement with “grand challenges”
 - Attraction of young professionals / image
- efficiency of Implementation (M)
 - Efficient bridge between research & innovation
 - Efficient & holistic management
- potential impacts (I)
 - Potential Technology Transfer (T)
 - Contribution to socio-economic impacts

Key for
getting
structural
funds





**In addition of scientific impacts,
there are many other impacts
not sufficiently known ...**

- **on Industry** (*data from ERID Watch*)
 - ✓ Huge market ~8-9 B€ per year
 - ✓ Increase of 5.5% over the last 10 years
 - o Direct commercialisation (e.g. Medical drugs)
 - o Leading edge technologies (e.g. instrumentation)
 - o Secondary industrial products (e.g. DNA sensors)
 - ✓ Marketing image for companies working with RIs
 - ✓ In addition, it is clear that ERIs open global markets for technologically-based companies





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Existing RIs

Impacts of the European Research Area

Research effectiveness: network-driven management

- ✓ Generates new standards and protocols
- ✓ Opens up to European and International users
- ✓ Gives access to critically important equipment
- ✓ Generates / enhances inter-disciplinary research
- ✓ Increases speed of end-user access
- ✓ Improves standing and visibility of European RIs





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Existing RIs

Impacts of Community actions

European added value: network-driven management

- ✓ Enables activities not possible otherwise
- ✓ increases involvement of researchers from New MS and improvements in RIs in NMS
- ✓ Expands existing / new research networks
- ✓ Open and free access on internet
- ✓ Develops a European spirit versus national



On Human Resources

- ✓ Access to the 'best' RI: more than 7000 user groups
- ✓ Mobility of Researchers (more than 30.000 people)
- ✓ Help training of science community users





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Conclusions? Challenges?

- ✓ Still a long way to go...
- ✓ Implementation of ESFRI roadmap for an efficient ERA
- ✓ Balanced distribution of RIs all over the ERA
- ✓ Further development of the e-infrastructure
- ✓ European favorable environment (e.g. legal, mobility)
- ✓ Policy & evaluation & decision making
- ✓ Governance of European RIs at an ERC-like discussion stage (which occurred just before FP6...)





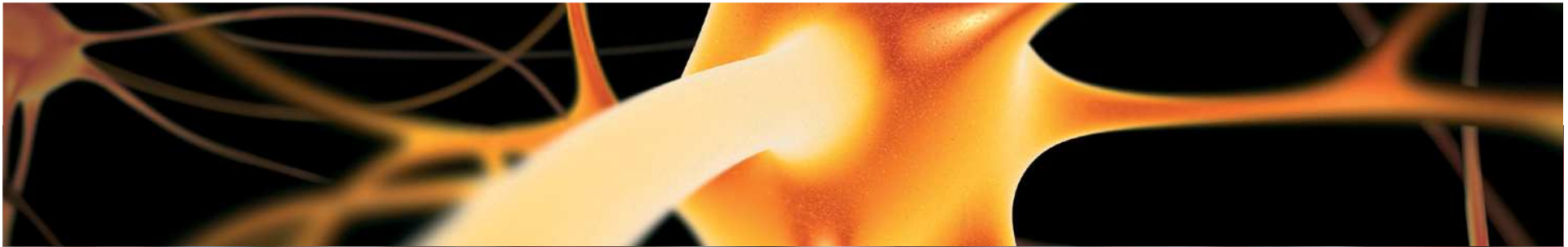
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For further information

- ESFRI on CORDIS
<http://cordis.europa.eu/esfri/>
- FP7 and Capacities Specific Programme
<http://cordis.europa.eu/fp7/>
<http://cordis.europa.eu/fp7/capacities/>
- Research Infrastructures on CORDIS (FP6)
<http://cordis.europa.eu/infrastructures/>
- Research Infrastructures in Europa
<http://ec.europa.eu/research/infrastructures>





Many thanks for your attention!

