Prof. Carlo RIZZUTO
Chair, European Strategy Forum for Research infrastructures (ESFRI)

European Initiatives for Research Infrastructures[*]

Abstract

The presence of very high quality and long term Research Infrastructures is a basic aspect for a Research Area to be attractive at world level, and has long-term cultural and economic returns. This has been the case of the Abbey-Libraries in the middle Ages, which have been a critical part for the European cultural and economic growth. More recently, internationally attractive Laboratories have helped Europe to keep a world leadership going from Materials Sciences, to Molecular Biology and Cultural Heritage, and are also the base for industrial competitivity.
The Academic world has a duty to help Governments in developing long-term plans and integrate efforts of different countries to keep this attractive capability and extend it to all regions in Europe.

[*] The paper is a Power point presentation delivered at the Conference.

Pan-EU Research infrastructures

- Research Infrastructures, of Pan-European interest, are facilities, resources/services of a unique nature allowing research communities to conduct top-level activities.
- This definition applies to all scientific fields, covers major equipment, sets of instruments and knowledge-containing resources such as collections, archives and data banks, including the associated human resources.
- They may be "single-sited", "distributed", and their service can be provided directly or electronically.
- To be attractive at international level, they must apply an "Open Access" policy for basic research, i.e. be accessible to all interested researchers, based on the sole scientific excellence of proposals selected by international peer review.

Report 2008

Podgorica 11-12 October 2008

Excellence and RIs

Europe has a long-standing tradition of excellence in research infrastructures, from the Middle Ages to now



Abbey-libraries: Knowledge and Research centres, they were also "Technology Transfer centres" and EU's cultural roots

More recently: CERN; EMBL; ESO; ESRF; ILL, and several "national-internationally open", in most fields

In all these cases the success is due to uniqueness and excellent quality , attracting&hosting world level scholars and researchers

Report 2008

Podgorica 11-12 October 2008

Keeping excellence

Needs and requirements are increasing in all fields, needing commitments and outreach well beyond single Country's capabilities ….but the money available for Research is limited

A common action is needed, by Academies and Governments

Resources must be pooled together, building a common Research Area

This in particular to ensure the sustainability of operation as "competitive open and free access"

Report 2008

Podgorica 11-12 October 2008

Global Dimension

The strategic impact of RIs is now understood also at Global level:

- G8 Science Ministers now discuss RIs:
  - Roadmaps and priority setting
  - Identification of new areas of cooperation
  - Promotion of mutual use of existing RIs
  - Ensuring "Open competitive access"
- This adds to urgency of EU coordination, and strong awareness + recommendations by the Council of Research Ministers.

Report 2008

Podgorica 11-12 October 2008

Research Infrastructures and capacity building

Report 2008

It is now clear that international Research Infrastructures support the competitivity in Science, and this transfers to Technology and Economy, both directly and through Education and Innovation

Examples:

- Libraries and collections to cultural production
- Socioeconomic and Cultural databanks to marketing
- Structural Biology to Medicine
- Physics&Astronomy to new Technologies
- Nanoscience to new Materials, Energy, Environment

If Research quality is high

Podgorica 11-12 October 2008

Role of ESFRI

(the European Forum For Research Infrastructures

Report 2008

- To address the strategic issue of RIs a coordinated approach is needed
- ESFRI has been set up by the Council of Ministers in 2002
- To develop a long term vision and to support a European RI policy
- Bringing initiatives and projects to a point where joint decisions are possible in an "open coordination" between different countries

ESFRI is composed by representatives of Ministers of the 27 Member States, 9 Associated States, and of the European Commission (EC)

Podgorica 11-12 October 2008

The RIs Roadmap

A main instrument, mandated from the Council of Ministers and developed by ESFRI, to plan for new or upgraded RI's

- First edition published in December 2006: several projects now are starting-up
- Connected national Roadmaps increasingly developed
- 1st Update started in June 2007, approved September 25th 2008, now being edited
- Will be presented to the Council and published beginning December 2008
- Proposed by Governments, selected by Peer Review

Report 2008

Podgorica 11-12 October 2008

Overview 2008

Social Science and Humanities 5 Projects

Environmental Sciences 10 Projects
(3 new in Arctic; Tropo & Ionospheric research; Plate tectonics)

Biomedical and Life Sciences 10 Projects
(4 new in Marine bio, biochemicals, Bioimaging, Hi-Sec Labs)

Energy 4 Projects
(1 new in Carbon Capture & Sequestration)

Physical Sciences and Engineering: 8 Projects
(1 new for Cherenkov-Gamma Astronomy)

Materials and Analytical Facilities: 6 Projects
(1 new for High Magnetic Fields)

E-Infrastructures 1 Project / *Wider input to many projects*

Total 44 = costs ~ 20 Billion euro in 10 years (~2B€year)

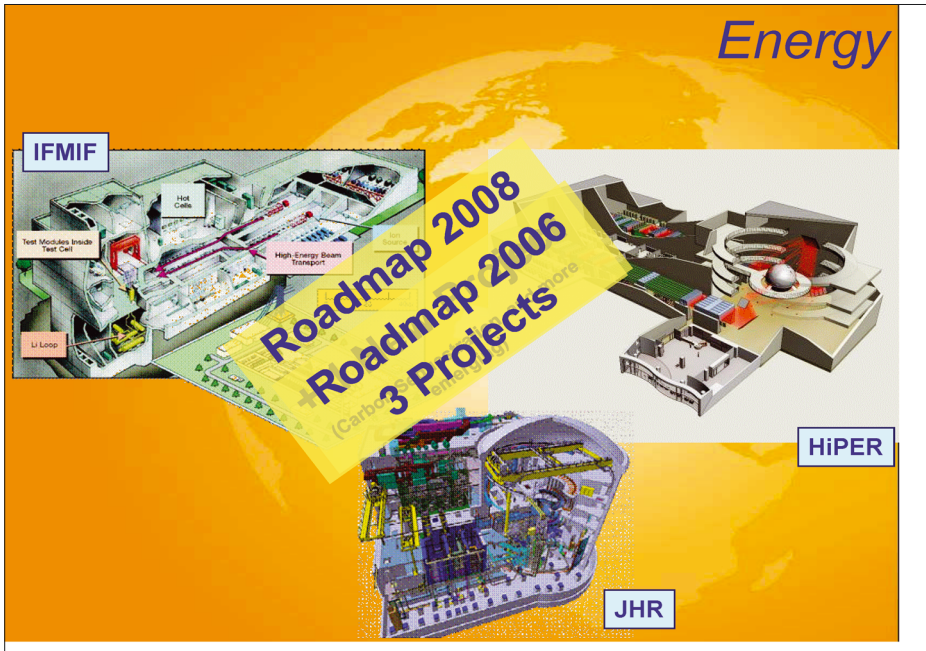
Report 2008

Podgorica 11-12 October 2008


Social Science and Humanities
CLARIN
Towards an integrated and interoperable research infrastructure of language resources and its technology enabling eHumanities
Easy access to Language Resources and Technology for the Humanities community
DDA
NSD
SSD
FSD
ESSDA
DANS
UKDA
ISSDA
ZA
BASS
CEPS/INSTEAD
ARCES
Réseau Quetelet
SIDOS
SDA
WISDOM
RODA
Roadmap 2008
5 Projects
CESSDA
European Social Survey
ESS
DARIAH
dariah.eu
Standards groups
Content centres
Shared tools
Infrastructure for History
Infrastructure for Linguistics
Local groups, projects, centres
SHARE
EROHS
HUB
Report 2008
Podgorica 11-12 October 2008


Biological and Medical Sciences
Biomedical and Life Sciences
CLINICAL TRIALS-ECRIN
Roadmap 2008
+ 4 New Projects
(marine biology; chemical biology screening; imaging tech; high security biolab)
6 Projects
STRUCTURAL BIOLOGY
INSTRUCT
BIOBANKS-BBMRI
INFRAFRONTIER
EATRIS
The European Advanced Translational Research Infrastructure in Medicine
Basic Research
University or Institute
Clinical Medicine
Hospital
Biomedical Industry
EBI-ELIXIR
Report 2008
Podgorica 11-12 October 2008

Podgorica 11-12 October 2008



Podgorica 11-12 October 2008


Materials and Analytical Facilities
Report 2008
Roadmap 2008
Roadmap 2006
6 Projects
ESS
FLASH @ DESY
IRUVX
FERMI
MAX IV
4GLS
IRUVX-EUROFEL
ESRF
ILL
isolated attosecond pulse
ELI
Podgorica 11-12 October 2008


Physical Sciences and Engineering
Report 2008
Research foundry
Research docking in manufacturing
PRINS
Collaborative proximity with Manufacturing & Academia
ELI
Roadmap 2008
Roadmap 2006
7 Projects
SPIRAL2
European ELT
KM3NeT
SKA
KM3NeT
FAIR
Podgorica 11-12 October 2008

e-Infrastructures & others

Report 2008

PRACE
(ex-EU-HPC)

Roadmap 2006
1 Project plus
reference to ESA &
CERN RM

No changes in the
Roadmap 2008
+ Increase of e-Infra
aspects in all

The ESA Cosmic Vision

The CERN Council
strategy for
particle physics

Podgorica 11-12 October 2008

RIs on the 2006 Roadmap - Underway

Report 2008

Social Sciences and Humanities	CESSDA	Facility to provide and facilitate access of researchers to high quality data for social sciences	AT, CZ, DK, FI, FR, DE, EL, HU, IT, RO, SI, ES, SE, NL, UK, NO, CH, USA
	CLARIN	Research infrastructure to make language resources and technology available and useful to scholars of all disciplines	AT, BG, CZ, DK, EE, FI, FR, DE, EL, HU, IT, MT, PL, T, RO, ES, SE, NL, UK, NO
	European Social Survey	Upgrade of the European Social Survey, set up in 2001 to monitor long-term changes in social values	BE, BG, FR, DE, IT, SI, ES, SE, NL, UK IS, NO, CH
	SHARE	Data infrastructure for empiric economic & social science analysis of ongoing changes due to population ageing	AT, BE, CZ, DK, FR, DE, EL, IE, IT, PL, SI, ES, SE, NL, UK, IL, CH, USA
Environmental Sciences	EURO-ARGO global	Ocean observing buoy system	BG, FR, DE, EL, IE, IT, PL, PT, NL, UK, NO
Energy	JHR	High flux reactor for fission reactors materials testing	BE, FR, FI, FR, ES
Biological and Medical Sciences	ECRIN	Pan-European infrastructure for clinical trials and biotherapy	AT, BE, DK, FI, FR, DE, HU, IE, IT, ES, SE, UK, CH
	ELIXIR (GLOBAL)	Upgrade of the European Life-science infrastructure for biological information	DK, FI, FR, DE, HU, IT, ES, SE, NL, UK, IS, IL, CH, EMBL
	Infrafrontier	European infrastructure for phenotyping and archiving of model mammalian genomes	CZ, DK, FI, FR, DE, EL, IT, PT, ES, SE, UK
Materials and Analytical Facilities	ESRF Upgrade	Upgrade of the European Synchrotron Radiation Facility	Member Countries
	European XFEL	Hard X-ray Free Electron Laser in Hamburg	DK, FR, DE, EL, HU, IT, PL, SK, ES, SE, UK, CH, Russia
	ILL20/20 Upgrade	Upgrade of the European Neutron Spectroscopy Facility	Member Countries
Physical Sciences and Engineering	FAIR	Facility for Antiproton and Ion Research	AT, FI, FR, DE, EL, IT, PL, RO, ES, SE, UK, India, Russia
	SPIRAL2	Facility for the production and study of rare isotope radioactive beams	BE, BG, CZ, FR, DE, HU, IT, PL, RO, ES, NL, UK, IL, USA
e-Infrastructures	PRACE	Partnership for Advanced Computing in Europe	AT, FI, FR, DE, EL, IT, PL, PT, ES, SE, NL, UK, NO, CH

construction "started", meaning funding and agreements almost in place

advanced preparation for construction but agreements and funding not yet in place

Podgorica 11-12 October 2008

Critical Issues

Implementation of the Roadmap:

- The total yearly requirement for construction (in ~ 10 years) and then operation is ~2 billion euro/year
- Construction in most cases could be achieved by project finance integrating National and Regional (public and private) funds, including EIB/EC instruments
- But longer term sustainability of project finance of R requires increased EU and/or national funding
- The role of EU is critically needed for sustainability in budget choices

Report 2008

Podgorica 11-12 October 2008

Other emerging issues

- Legal frame for Pan-EU RIs
- Improve and prioritize the expenditure through high level evaluation
- Strengthen socioeconomic returns and regional aspects & improve management
- Definine Applied vs Basic equilibria
- Expand e-Infrastructure aspects
- Extend connection to “main Challenges” (Food, Environment, Health, Energy)
- Involve all regions of Europe

Report 2008

Podgorica 11-12 October 2008

Proposal for a Legal Framework for RIs

- Complex and expensive Research Infrastructures require also an adequate EU legal framework
- Responding to ESFRI proposal, the EC has developed a new Regulation for Legal Framework, to be approved by Council in December 2008
- Recognised in all Member States, this legal framework will reflect the spirit of a European venture, but allowing the participation of non-EU entities
- It should also help to clarify tax treatment comparable to international research institutions

Report 2008

Podgorica 11-12 October 2008

Other emerging issues (2)

ESFRI will adopt a proactive role in most issues e.g. clarifying how socio-economic returns can help project-financing and better management; helping the choice of siting; interacting with Joint Technology Initiatives to improve Applied vs Basic R aspects; extend the roadmap in the "big Challenges", e.g. Energy and Food; implement e-Infrastructures aspects

One emerging indication (e.g. from Green Paper): improve the expenditure through high level evaluation and prioritization, will require developing EU level "peer review" specific for longer term projects

Report 2008

Podgorica 11-12 October 2008