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Research Infrastructures within



Hervé Péro

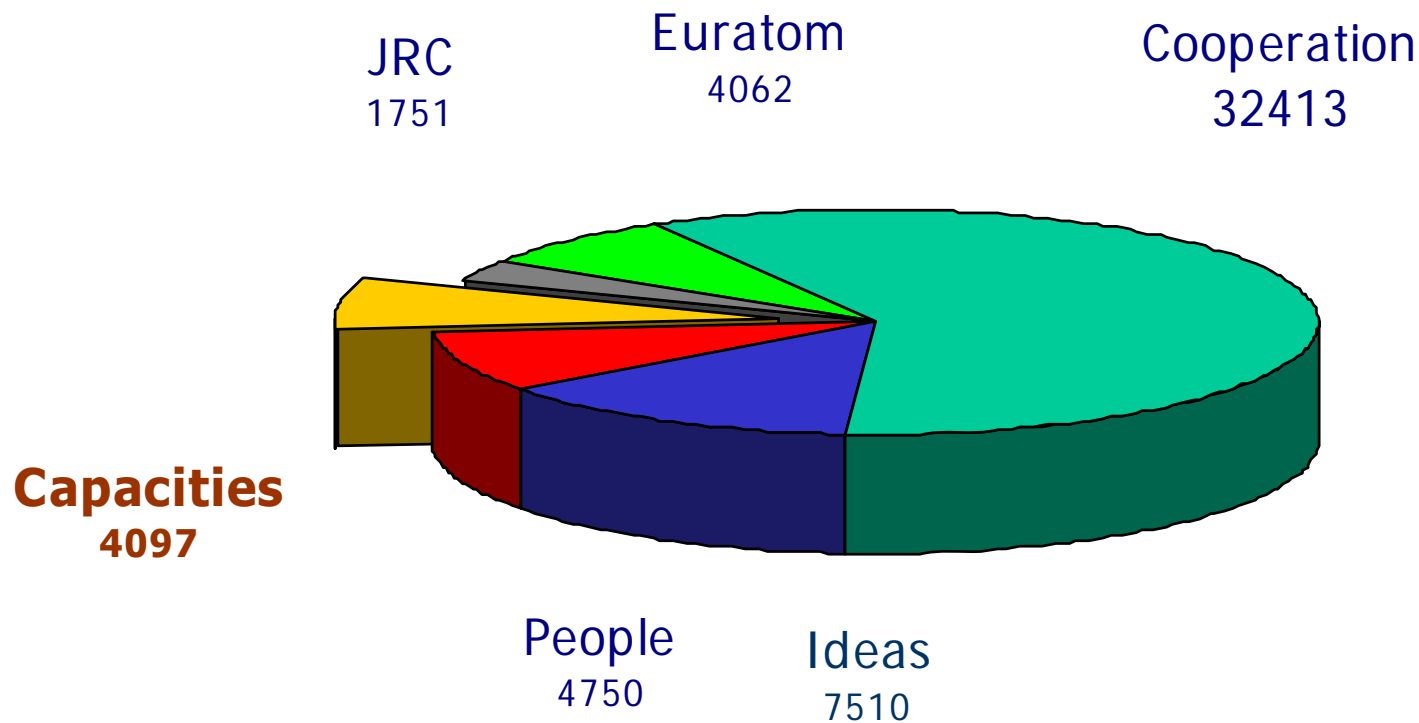
European Commission
Head of Unit – Research Infrastructures

November 2006





FP7 2007 - 2013

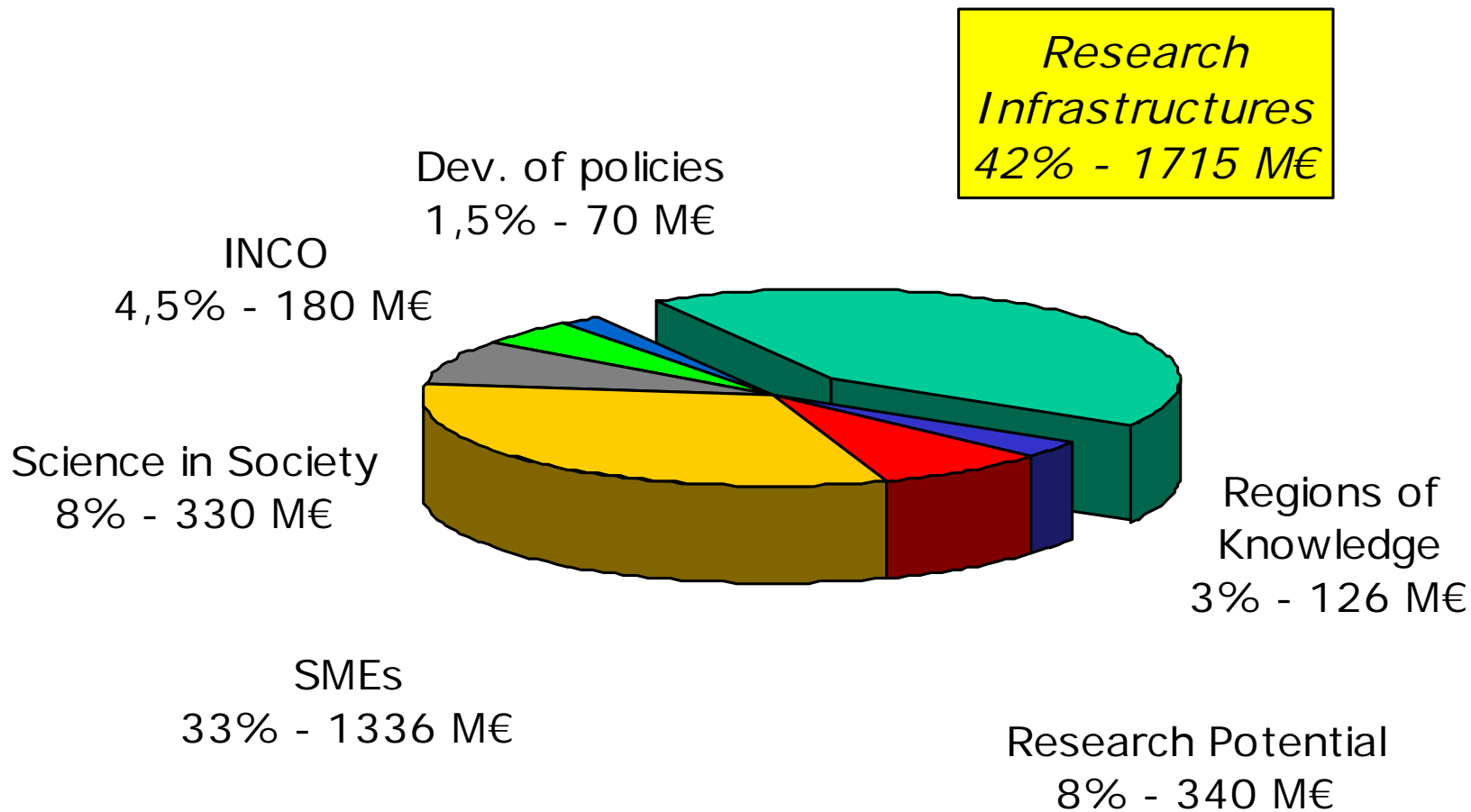


FP7 budget (M€)
Source: revised FP7 agreed by Council + Parliament in October 2006





“Capacities”





FP7: What will be new ?

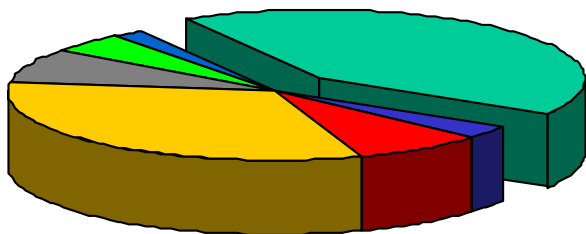
- **Evolution, not revolution**
- **Increase in duration and budget**
- **New Structure: 4 Specific Programmes**
- **European Research Council**
- **Joint Technology Initiatives**
- **New infrastructures and RSFF**
- **Simplification & externalisation of management**



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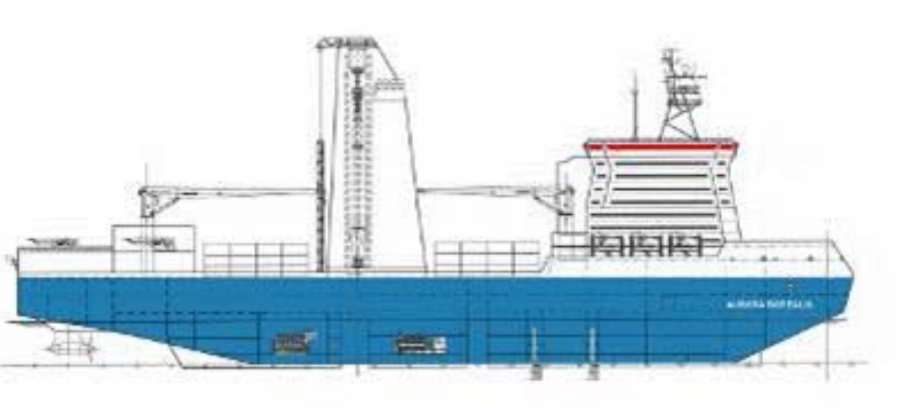
An highlight on Research Infrastructures in FP7



*Research
Infrastructures
1715 M€*



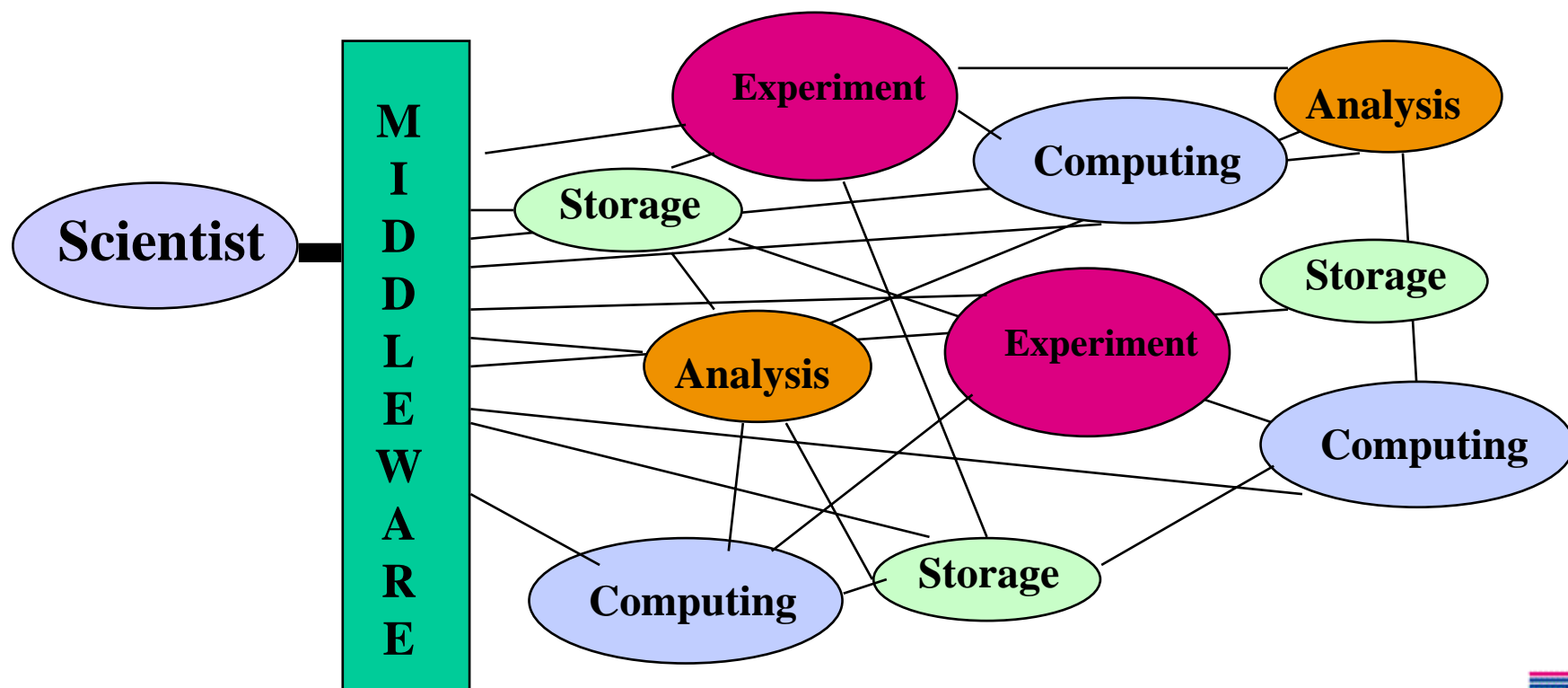
Definition of Research Infrastructures



- **Facilities, resources, and related services used by the scientific community for**
 - **Conducting leading-edge research**
 - **Knowledge transmission, knowledge exchanges and knowledge preservation**
- **Includes**
 - **Major scientific equipment**
 - **Scientific collections, archives and structured information**
 - **ICT-based infrastructures**
 - **Entities of a unique nature, used for research**

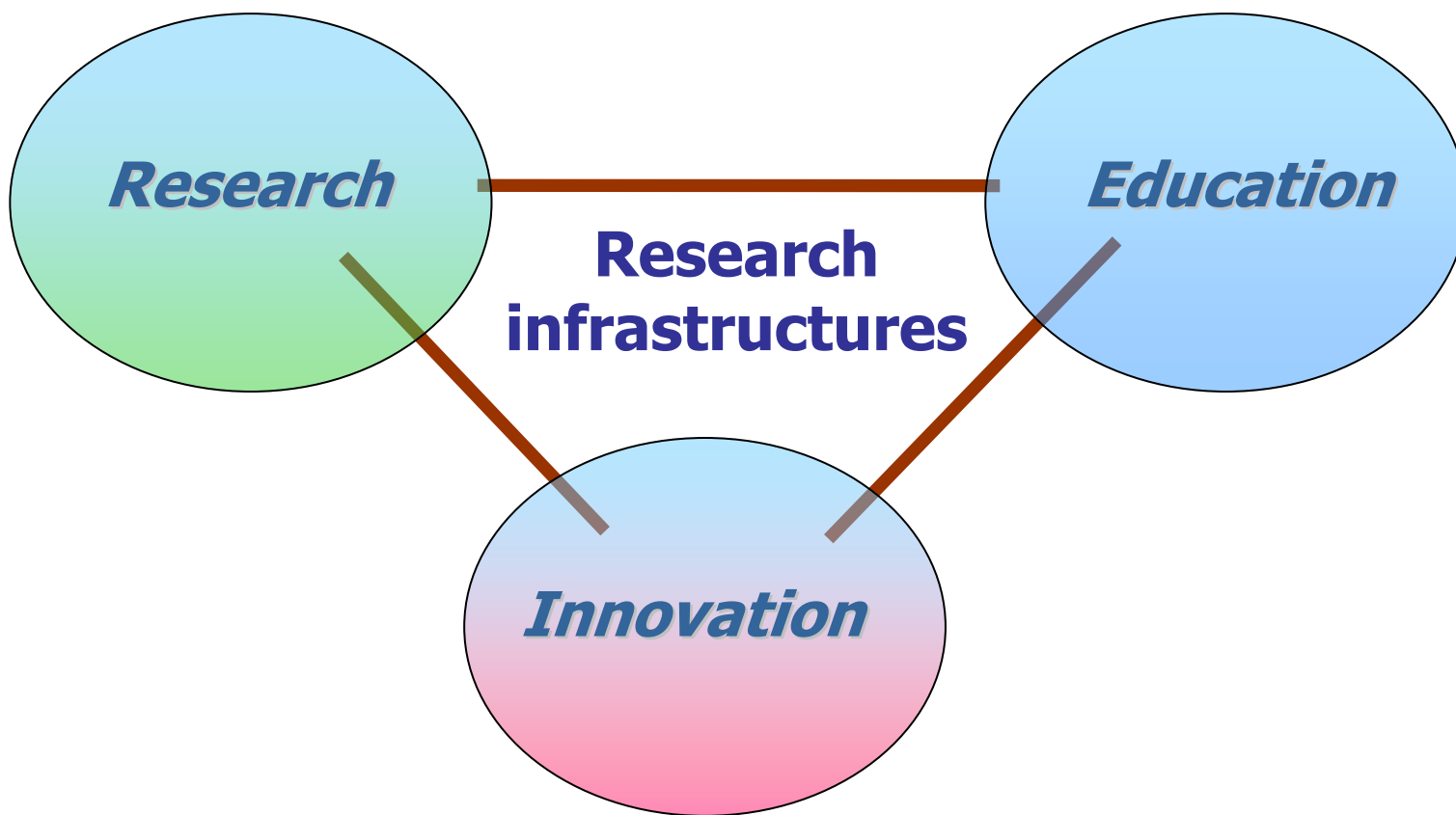


Considering the increased relations between scientists, experiments, data and e-science...



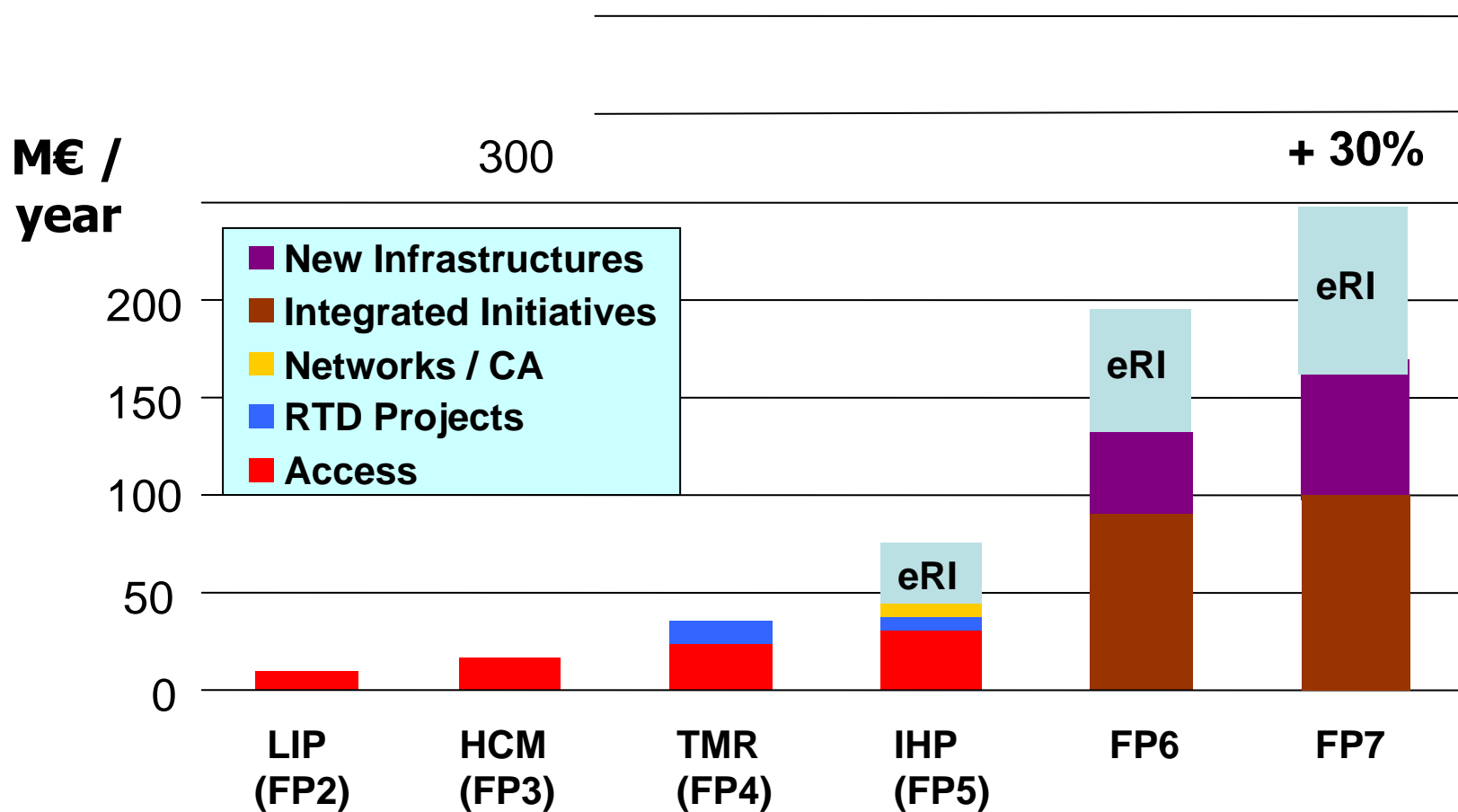


... Research Infrastructures are at the core of the knowledge Triangle





A continuous increase of budget over successive FPs





Some information on Research Infrastructures in FP6

Facts and Figures:

- **Total budget:** **735 M€**
 - of which 222 for GRID + GEANT
- **Number of projects** **143**
- **Number of RIs supported** **248**
- **Expected number of users** **>20000**
(2004-2010)



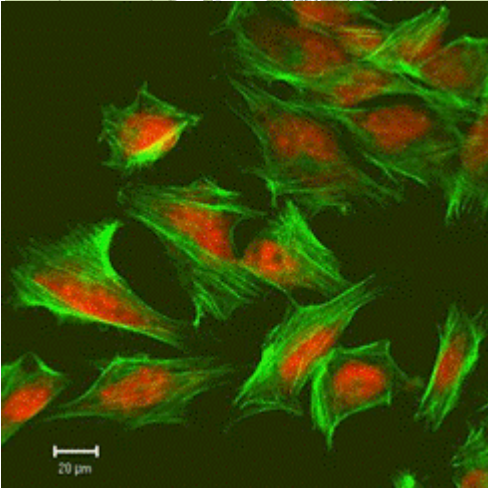
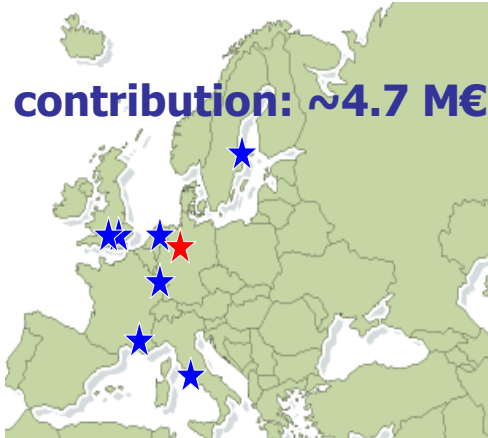
Importance of I3s to reduce European fragmentation and dispersion of existing facilities



EUPRIM-Net (Biomedical Sciences)

Developing a pan-European research infrastructure of primate centres

EC contribution: ~4.7 M€



TA (~1.3 M€):

- Gene, tissue, cell, gamete and serum banks
- Experimental animals

NA (~1.7 M€):

- Standards (SOPs for quarantine and experiments)
- Training on handling (blood sampling, injections...)
- Courses and textbook (primate behaviour, husbandry, nutrition...)

JRA (~1.7 M€):

- Molecular typing methods
- Pathogen detection assays
- Telemetry prototyping

➤ **Refinement, Replacement**

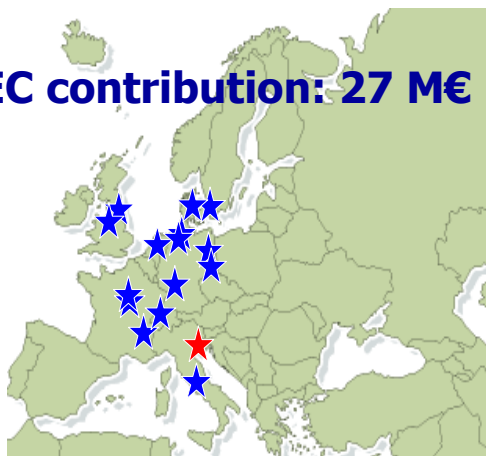




(Analytical Facilities)

Developing a pan-European Synchrotron and Free Electron Laser infrastructure

EC contribution: 27 M€



TA (~19 M€):

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

NA (~2 M€):

- Specialized workshops, conferences and schools (support areas of transnational cooperation)
- Exchange of scientists

JRA (~6 M€):

- European platform for Protein Crystallography
- Development of:
 - Instrumentation for Femtosecond Pulses
 - Diffractive x-ray optics
 - Superconducting Undulator
 - Photoinjector for X-ray Free Electron Lasers

➤ **Offering a common access platform**





Main characteristics of an average Integrating Activity under FP6

- **Average number of contractors: 19 of which 7 are offering access**
- **Typical duration of 4 years**
- **Average EC contribution: ~10 M€**
 - **Management: ~ 6%**
 - **Networking Activities: ~ 15%**
 - **Trans-national Access: ~ 36%**
 - **Joint Research Activities: ~ 43%**
- **List of funded projects (FP6)**
<http://cordis.europa.eu/infrastructures/projects>





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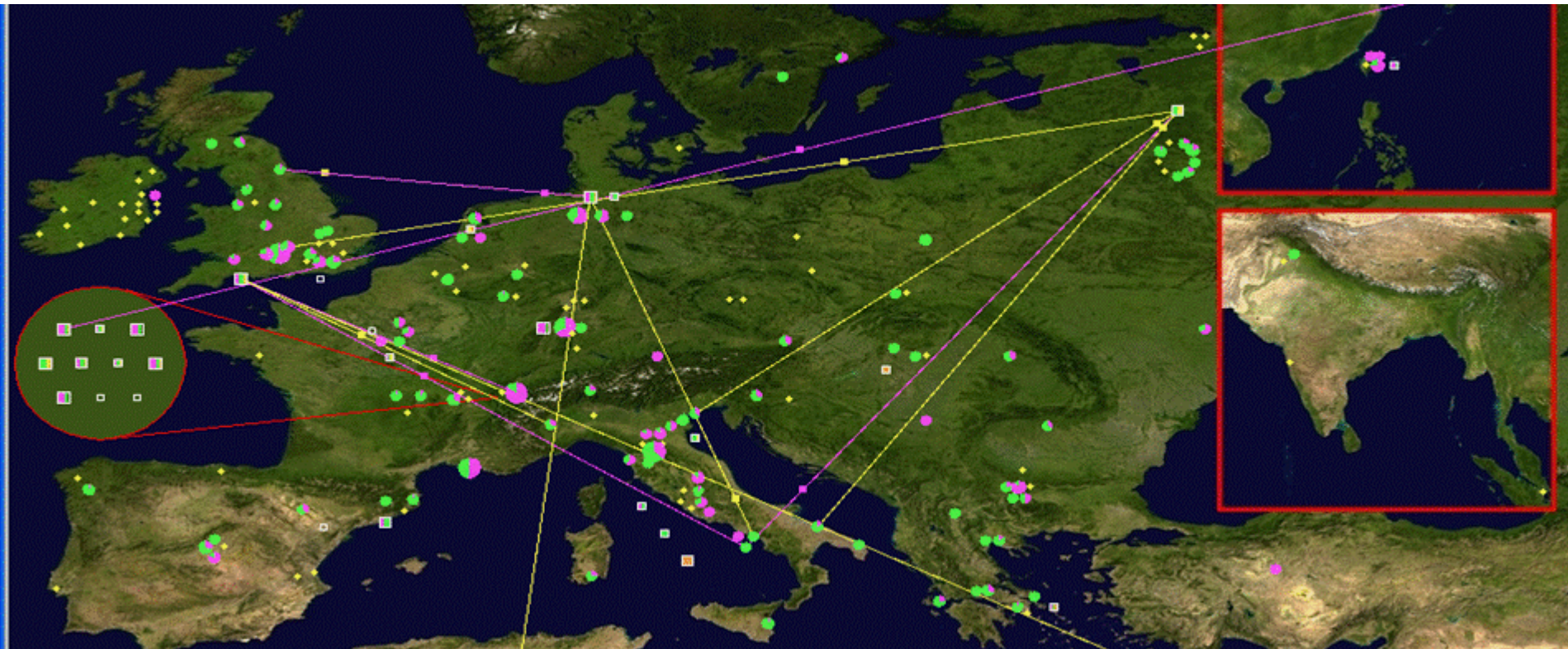


EGEE (grids)

- ~ 500 sites in 40 countries
- > 60 Virtual Organisations
- ~ 24 000 CPUs
- > 5 PB storage
- > 10 000 concurrent jobs/day

- Scientific communities
 - High Energy Physics*
 - Astrophysics*
 - Computational Chemistry*
 - Fusion*
 - Geophysics*

Life Sciences
Biomedics
Earth Sciences
Finance
Multimedia...

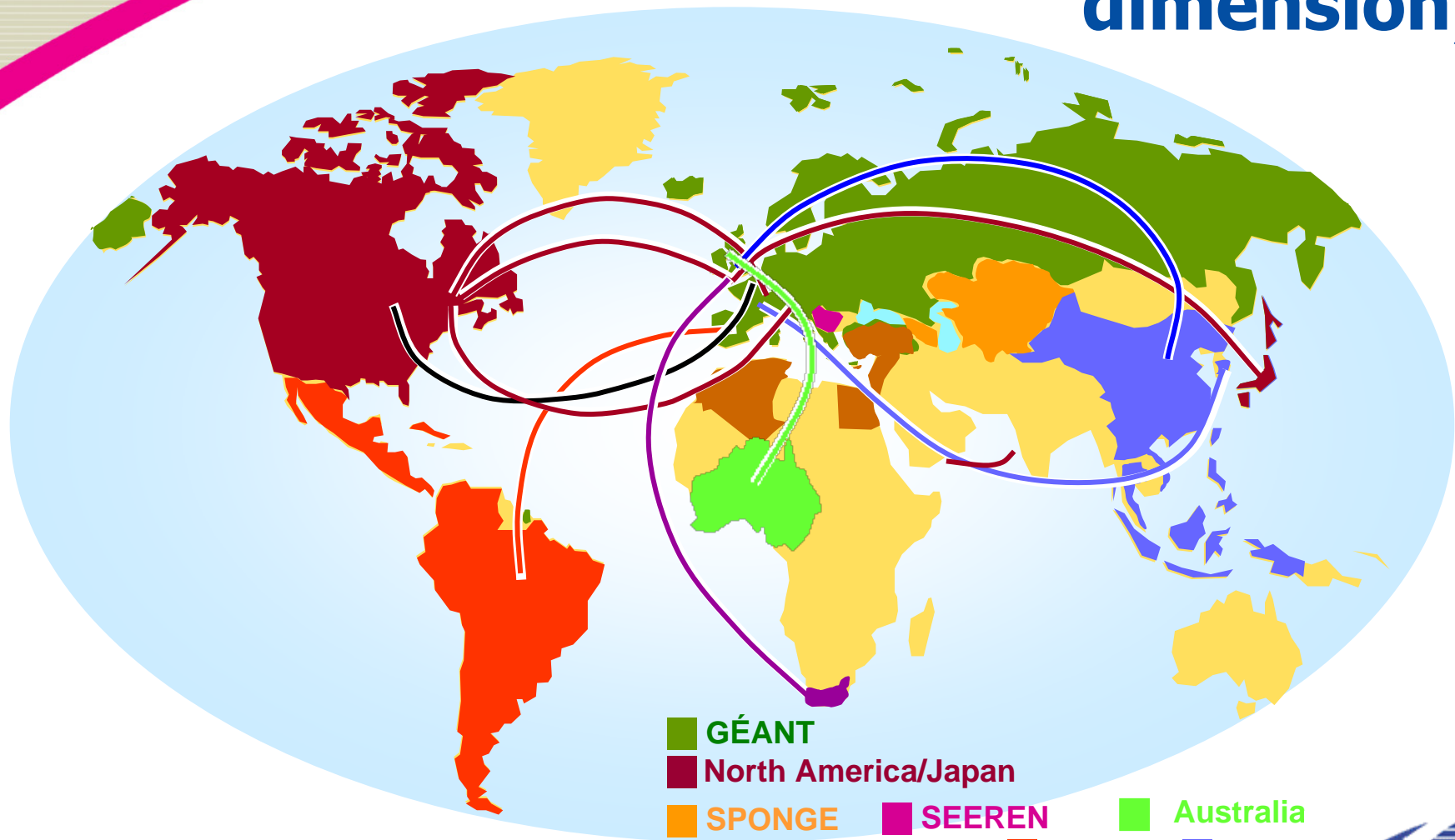




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GÉANT (global dimension)



- GÉANT
- North America/Japan
- SPONGE
- SEEREN
- Australia
- EUMEDCONNECT
- ALICE
- TEIN2
- S. Africa
- China
- India





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DEISA cluster of supercomputers (grids)

21.900 processors and 145 TF in 2006, more than 190 TF in 2007

AIX IBM domain



RZG (DE)

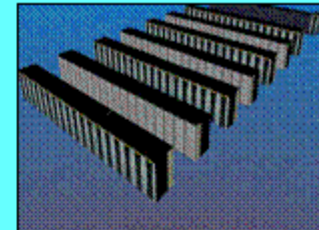


IDRIS (FR)

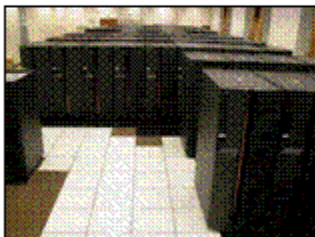
LINUX SGI



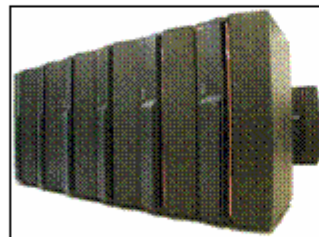
SARA (NL)



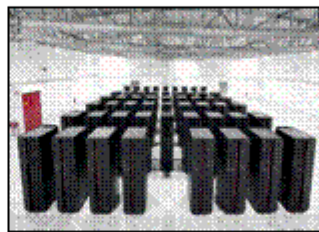
LRZ (DE)



ECMWF (UK)

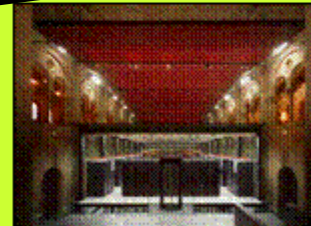


CINECA (IT)



FZJ (DE)

LINUX Power-PC



BSC (ES)



CSC (FI)

**High Performance
Common Global File
System**





Objectives of the Community Research Infrastructures action

- **Optimising the use and 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 needed by the European scientific community**
- **Supporting **programme implementation** and **policy development** (e.g. international cooperation)**



FP7 will continue supporting existing Research Infrastructures

- **Integrating Activities** to promote the coherent use and development of research infrastructures in a given field, *implemented through:*
 - **A bottom-up** approach for proposals open to all fields of science
 - **Targeted** approach with topics defined in cooperation with the FP7 thematic areas
- **ICT based e-infrastructures** in support of scientific research

600 M€
2007-2013





ICT-based Infrastructures

- Scientific communities need access to **Data**, but dramatic **increase** in volume and characteristics of raw data requires a **change** in culture;
- Specific **e-infrastructures** needed for storage, high speed connectivity, computational grids and data management;
- High performance computing to be followed under « **new** » research infrastructures

410 M€
2007-2013





Integrating Activities and e-infrastructures

- **To optimise the use and development of existing research infrastructures**
- **Based on the continuation of the successful FP6 instrument “**Integrated Infrastructure Initiative**” (I3s)**
- **Within one single contract:**
 - Networking activities
 - Transnational access and/or service activities
 - Joint research activities



Networking Activities

- To foster a culture of **co-operation** between the participants and the scientific communities benefiting from the research infrastructures
- Forms of activities:
 - ➔ Towards **the users**: training, studies, feedback, coordination...
 - ➔ Towards **good practice**: exchange of personnel and visits, standards and quality...
 - ➔ Towards **virtual infrastructures**: Web-sites, common softwares, databases, data management...
 - ➔ **Technical workshops**, forums, working groups and studies...



Trans-national Access and/or Service activities

- Provide **trans-national access** to researchers or research teams to one or more infrastructures among those operated by the participants
 - "Hands on" access
 - **Remote** access: sending of samples, sample analysis...
- Provide research infrastructures related **services** to the scientific community
 - Services provided through **electronic means** ;
Data and resources management
 - Upgrading **communication** infrastructure
 - Support of **Grid** infrastructure;
support of **middleware** component repositories



Joint Research Activities

- **Explore new fundamental technologies or techniques underpinning the efficient and joint use of the participating research infrastructures**
To improve the services provided by the infrastructures (in quality and/or quantity)
- **Forms of activities:**
 - **Prototype** development
 - Development of **methods, protocols, standards...**
 - Development of **software**, middleware, algorithm;
Database creation, upgrade, curation...
 - Development and **curation** of samples



Call for proposals N°1 – launched early 2007

- **Existing e-infrastructures (89 M€)**
Scientific Digital Repositories, deployment of e-Infrastructures for new Scientific Communities, e-Science Grid Infrastructures
- **Support measure for some FP6 I3**
(finishing before March 2008)
- **Closure: April 2007**
- **Single stage procedure for evaluation**
remote + panel evaluation
- **First contracts will come into force before the end of 2007**



Call for proposals N°2 – closing early 2008

- For both **bottom up** and **targeted approach**
- **Indicative budget of 275 + 115 M€**
 - ➔ 25 to 30 RTD projects to be selected
 - ➔ GÉANT and Scientific Data Infrastructures
- **Closure: March 2008**
- **Single stage procedure for evaluation**
 - ➔ remote + panel evaluation
- **First contracts will come into force before the end of 2008**



Support to new research infrastructures

- **Design studies:** to support the conceptual design for new facilities or major upgrades, of clear European dimension and interest
 - through bottom-up calls
- **Support to the Construction of new infrastructures and major upgrades to existing ones**
 - the list of projects to be supported will be based on the work conducted by the European Strategy Forum on Research Infrastructures (ESFRI roadmap)



FP7 will support the design of new research infrastructures (or major upgrades)

- **Design studies** aiming at the conceptual design, not at a detailed design
- **Case of e-Infrastructures:** to foster new organisational models in domains of grids & data
- **EC support** likely to be smaller than under FP6, i.e. less than 5 M€
- **bottom-up** call...
- Useful to feed the ESFRI roadmap process

70 M€
2007-2013



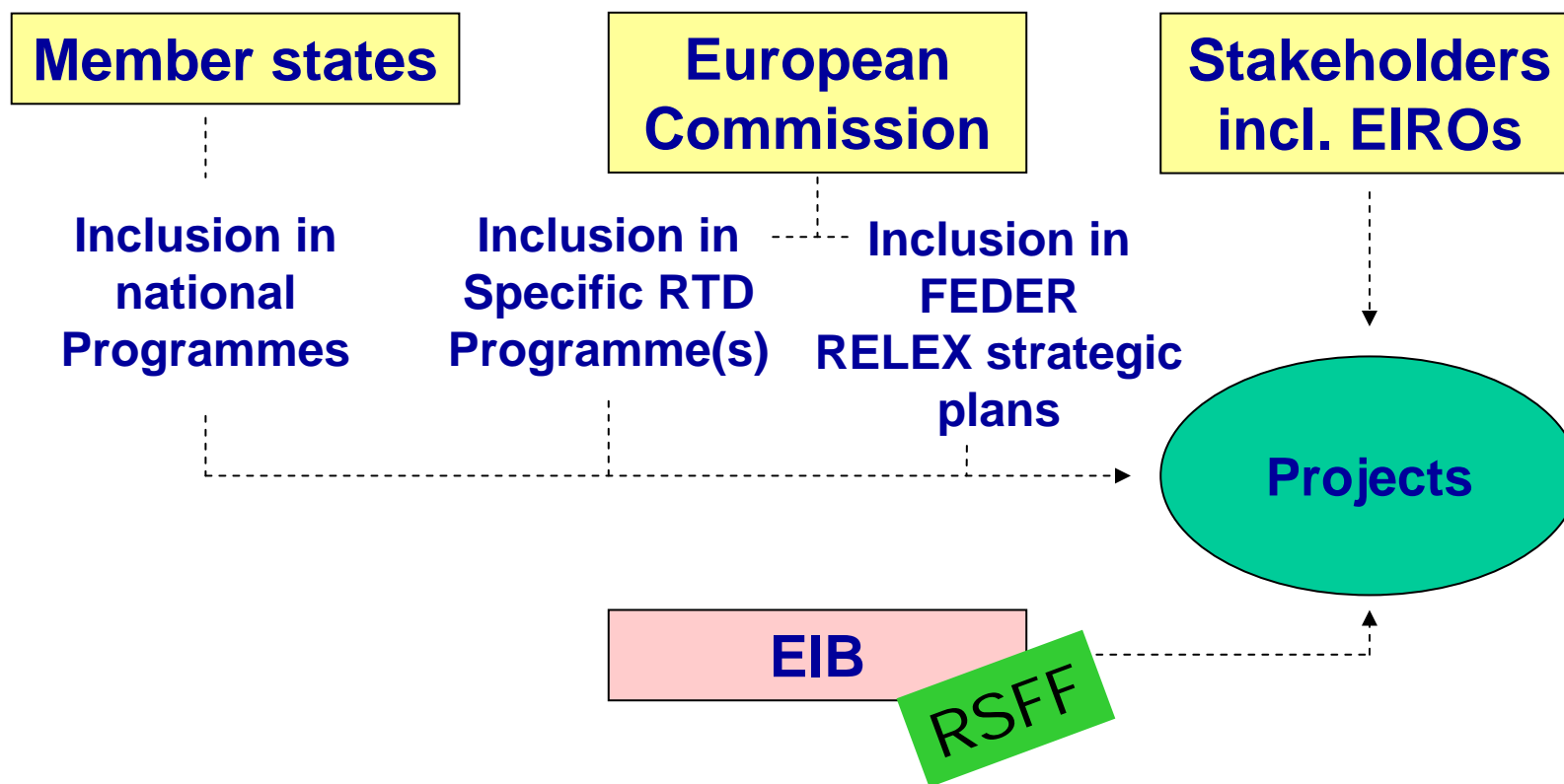
FP7 will support the construction of new Infrastructures (or major upgrades)

500 M€
2007-2013

- **A two-stage process:**
 - The **preparatory phase**: to check the commitment of the Member States and reach a **(draft) agreement** between Member States and stakeholders for the construction
 - The **implementation phase**: the actual construction
- **The list of projects to be supported in 2007 will be based on the work conducted by **ESFRI****



Financial engineering for new research infrastructures





The Preparatory phase

- **Tasks focusing on:**
 - ➔ Strategy development
 - ➔ Technical work (e.g. final prototypes)
 - ➔ Governance and logistical work
 - ➔ Financial arrangements
 - ➔ Legal issues
- The first call will be restricted to the projects identified in the **2006 ESFRI roadmap**
- Direct EC (average) contribution around **5 M€**





Participation to the Preparatory phase

- Project **consortia** should involve, as appropriate :
 - ➔ Public authorities or funding agencies at national and/or regional level
 - ➔ Research and development agencies
 - ➔ Operators of research facilities
 - ➔ Research centres, universities, industry
- The European Commission may act as a **“facilitator”**



Call for proposals N°1 – closing in spring 2007

- For **design studies** and **preparatory phase**
- Indicative budget for **design studies: 35 M€**
 - 7 to 10 projects to be selected
- Indicative budget for **preparatory phase: 135 M€**
 - 34 projects
- **Closure: April 2007**
- **Single stage procedure for evaluation**
 - remote + panel evaluation, with possible hearings
- **First contracts will come into force before the end of 2007**



Accompanying measures

Support actions through a mixed bottom-up / top down approach, for:

- the development of an **RI European policy** and the development of **international cooperation**
- Supporting **programme implementation** (NCPs) and the coordination of research infrastructures in **emerging areas**

ERANETS

60 M€
2007-2013





Call for proposals N°1 – closing in spring 2007

- **For:**
 - ERA-NETs
 - Studies, conferences, coordination actions for policy development (e-infrastructures)
 - NCPs and other support actions, as appropriate
- **Indicative budget of 25 M€**
 - 15 to 20 projects to be selected
- **Closure: April 2007**
- **Single stage procedure for evaluation**
- **First contracts will come into force before the end of 2007**

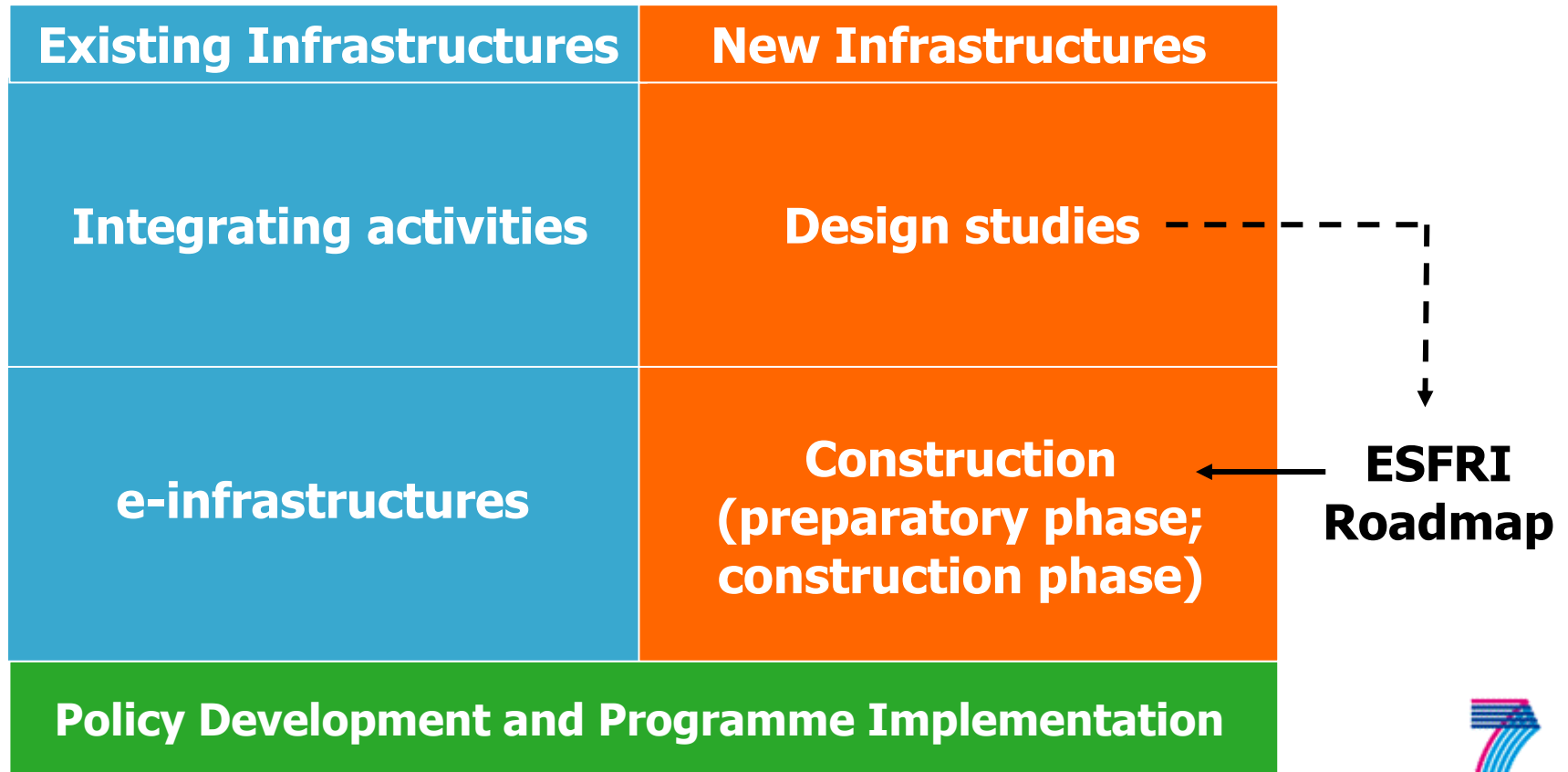


Call for proposals N°2 – closing early 2008

- **For:**
 - **Studies, conferences, coordination actions for policy development (not for e-infrastructures)**
 - **Coordination actions to support emerging needs**
- **Indicative budget of 5 M€**
 - **Around 5 projects to be selected**
- **Closure: March 2008**
- **Single stage procedure for evaluation**
- **First contracts will come into force before the end of 2007**



FP7 Research Infrastructures in brief





Funding schemes

Existing Infrastructures	New Infrastructures
Integrating activities	Design studies
e-infrastructures	Construction (preparatory phase; construction phase)
Policy Development and Programme Implementation	

→ A combination of Collaborative projects
and Coordination and support actions (I3s)





Funding schemes

Existing Infrastructures	New Infrastructures
Integrating activities	Design studies
e-infrastructures	Construction (preparatory phase; construction phase)
Policy Development and Programme Implementation	

→ Collaborative projects or Coordination and support actions (whenever appropriate)





Funding schemes

Existing Infrastructures	New Infrastructures
Integrating activities	Design studies
e-infrastructures	Construction (preparatory phase; construction phase)
Policy Development and Programme Implementation	

→ Coordination and support actions



Evaluation criteria

→ Evaluation by independent experts

- **S&T quality:** excellence of the overall project and of the specific activities
- **Impact:** contribution of the project at the European level
- **Implementation:** management, partnership, implementation plan and allocation of resources



Planning of calls and indicative budget

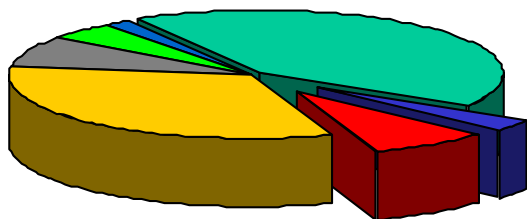
Total operational budget 1630 M€	<i>Call 1 2007</i>	<i>Call 2 2008</i>	<i>Call 3 2010</i>	<i>Call 4 2012</i>
Integrating activities		275	x	x
e-Infrastructures	89	115	x	x
Design studies	35		x	
Construction – Support to the Preparatory Phase	135		x	
Construction – Support to the Implementation Phase	RSFF (200 M€) + 100 M€			
Policy Development and Programme Implementation	25	5	x	x
Total per call (M€)	284	395		



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A brief highlight on Regional Research Potential in FP7



Research
Potential
340 M€

Regions of
Knowledge
126 M€





Increased Capacity of European Regions

- aim:*
- ✳ to intensify role of RTD in economic development
 - ✳ to invest in research
- actions:*
- ✳ to improve links between stakeholders and local business community
 - ✳ to foster transnational cooperations
 - ✳ to enhance mutual learning of regional actors
 - ✳ to exchange experience and best practice
 - ✳ to *develop joint action plans*



Two lines of action...

“Regions of Knowledge”

- for **ALL** European regions
- to encourage and support the **development** of « **regional research driven clusters** »

8 M€
in 2007

“Research Potential”

- for **Convergence & Outermost** regions
- to unlock and develop their research potential
- to help researchers to successfully participate in research activities at EU level

25 + 8 M€
(Balkans) in 2007





Expected Impacts

Regions of Knowledge:

- **Regional economical growth** in selected domains
- **Response to the needs** of regional communities
- **Mobilisation** of local, national and community funds to implement defined ***regional "action plans"***

Research Potential:

- **Optimisation** of international exposure and recognition, leadership potential, quality of scientists
- **Increase** of visibility of their research groups and of participation in the ERA/FP



Useful links

- **FP7 Proposal and Capacities Specific Programme**
<http://cordis.europa.eu/fp7/>
<http://cordis.europa.eu/fp7/capacities.htm>
- **Research Infrastructures on CORDIS (FP6)**
<http://cordis.europa.eu/infrastructures/>
<http://cordis.europa.eu/ist/rn/>
- **ESFRI (Eur. Strategy Forum for Research Infrastr.)**
<http://cordis.europa.eu/esfri/home.html>
- **e-Infrastructures Reflection Group (e-IRG)**
<http://www.e-irg.org>
- **International Scientific cooperation policy:**
<http://europa.eu.int/comm/research/iscp/>





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Thanks

Tack

Ευχαριστώ

Grazie

Danke

Kiitos

Bedankt

Gracias

Hvala

Obrigado

Köszönöm

Merci

pour votre attention

Teşekkür ederim

धन्यवाद

СПАСИБО

ありがとう

