e-Infrastructures: building on the past, preparing the future

Kostas Glinos (konstantinos.glinos@ec.europa.eu)
European Commission - DG INFSO
Head of Unit, GÉANT & e-Infrastructure Unit

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Taking stock of the present

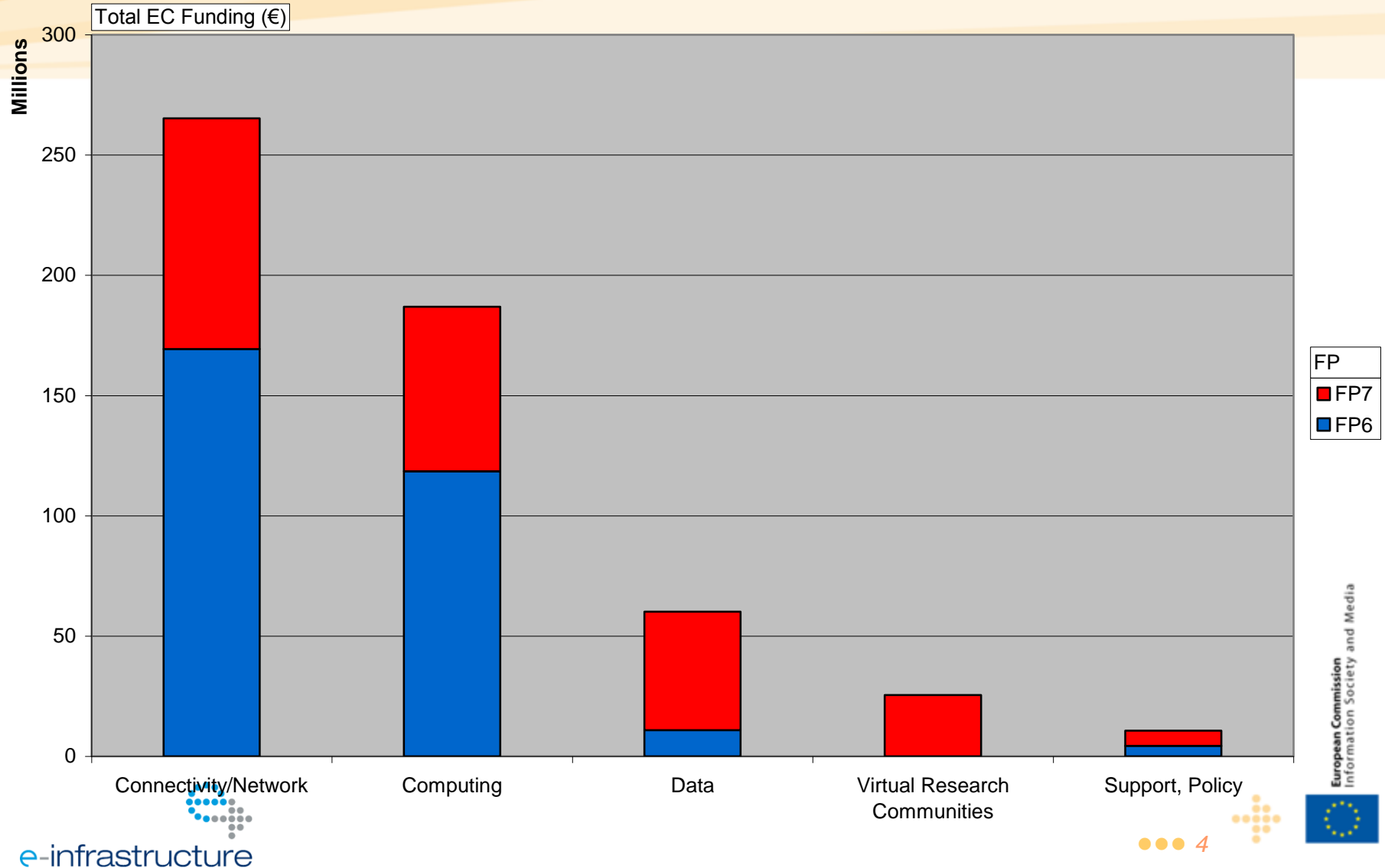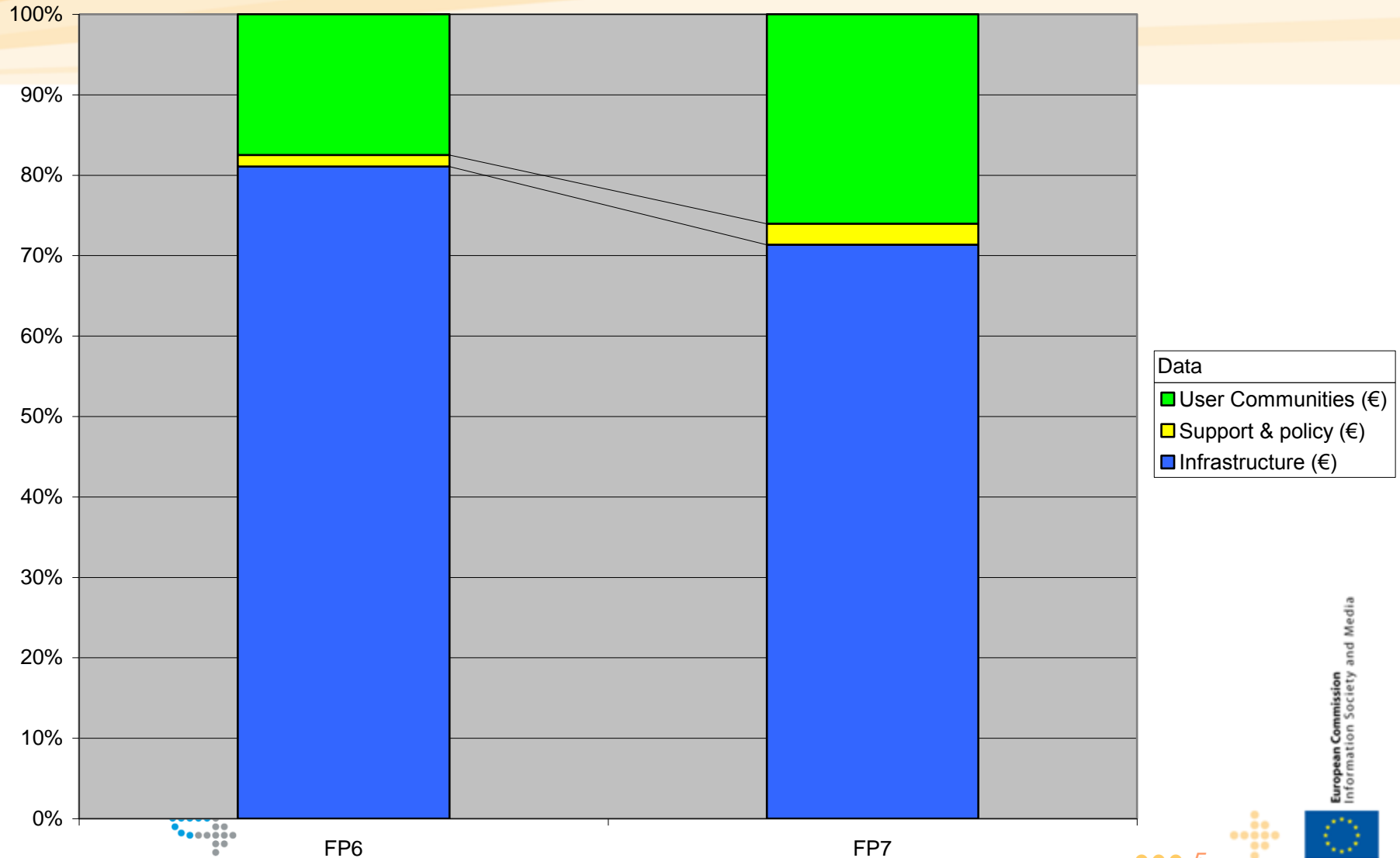e-infrastructure

e-Infrastructures in FP6 & FP7 (half): funding per topic (1)
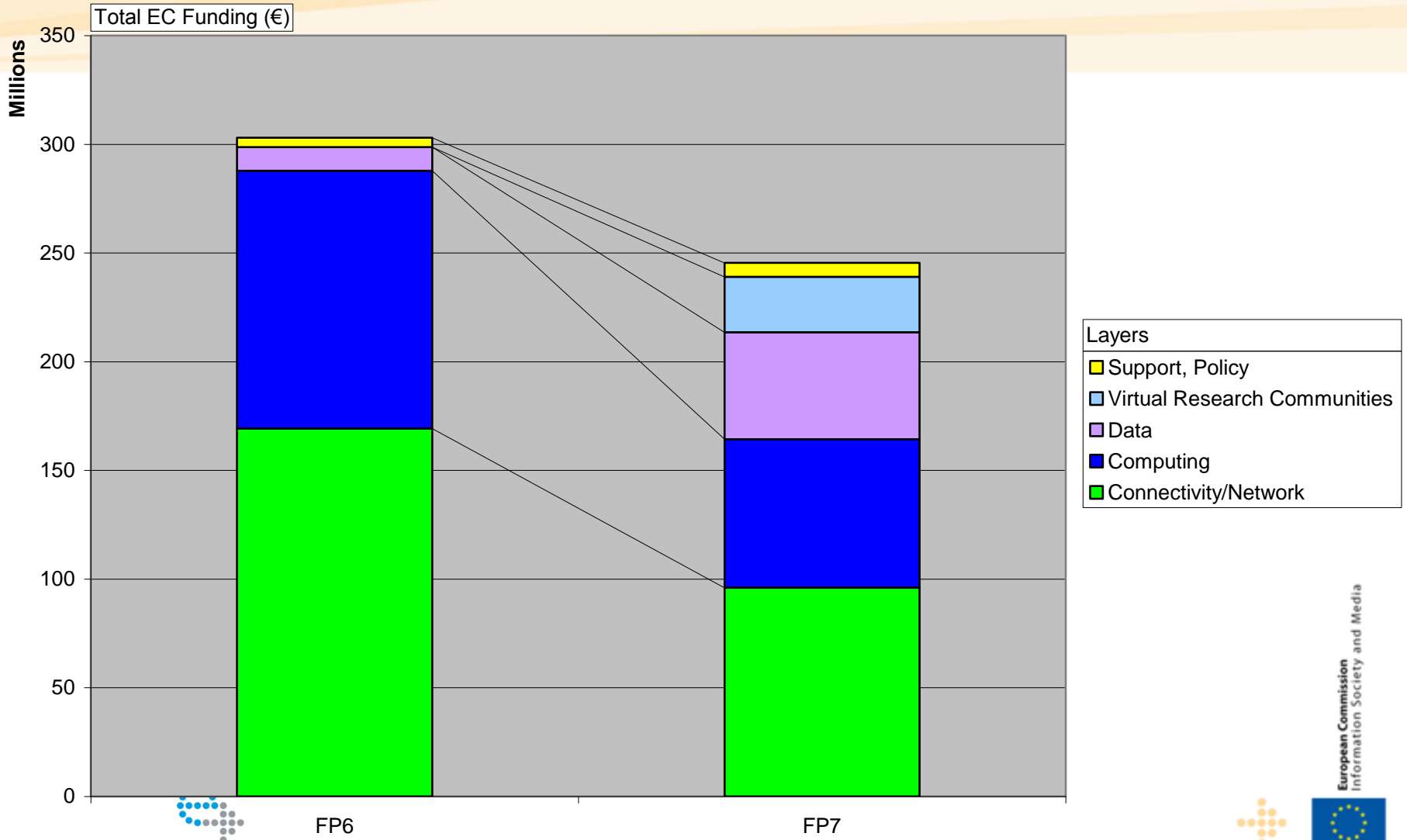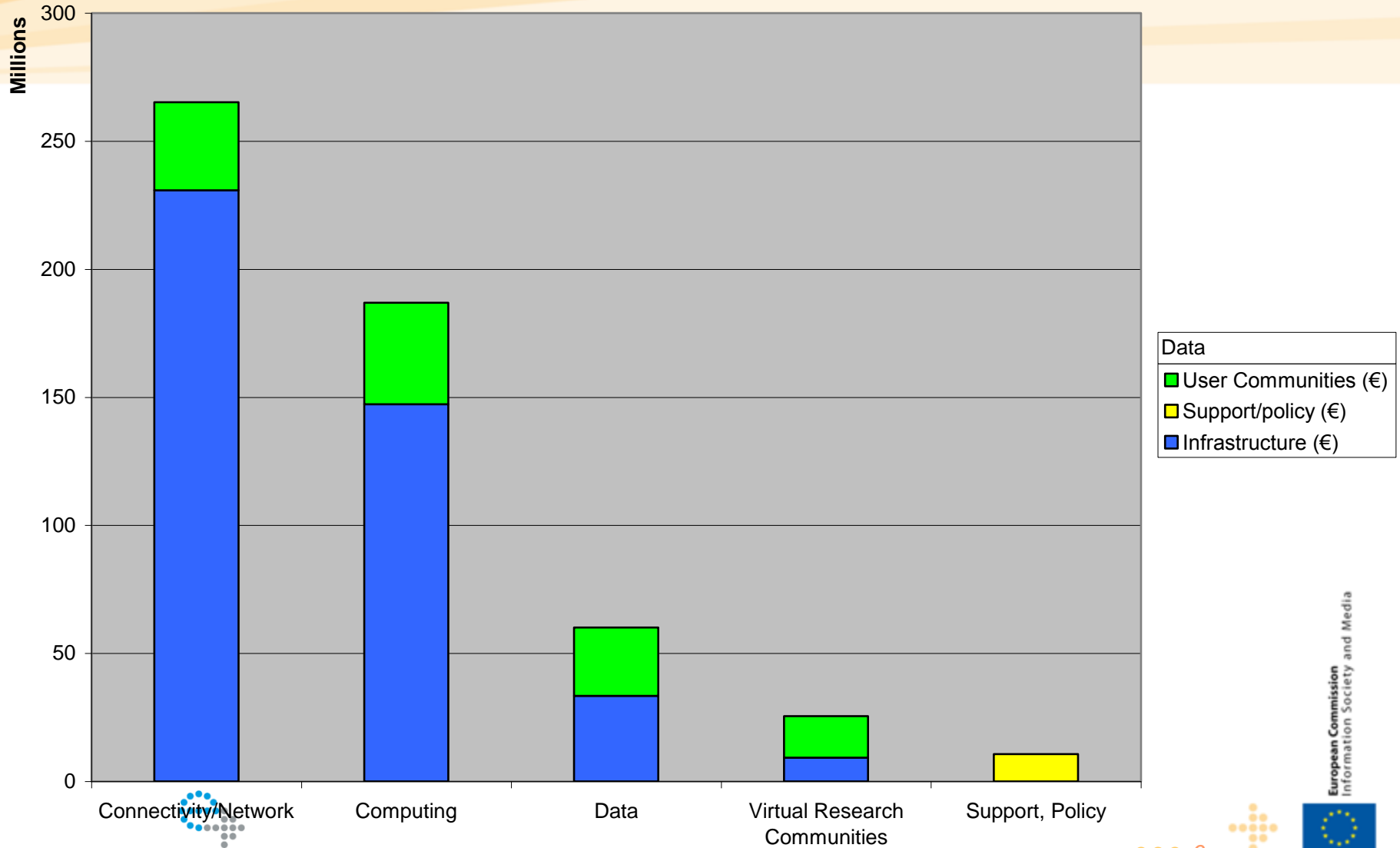
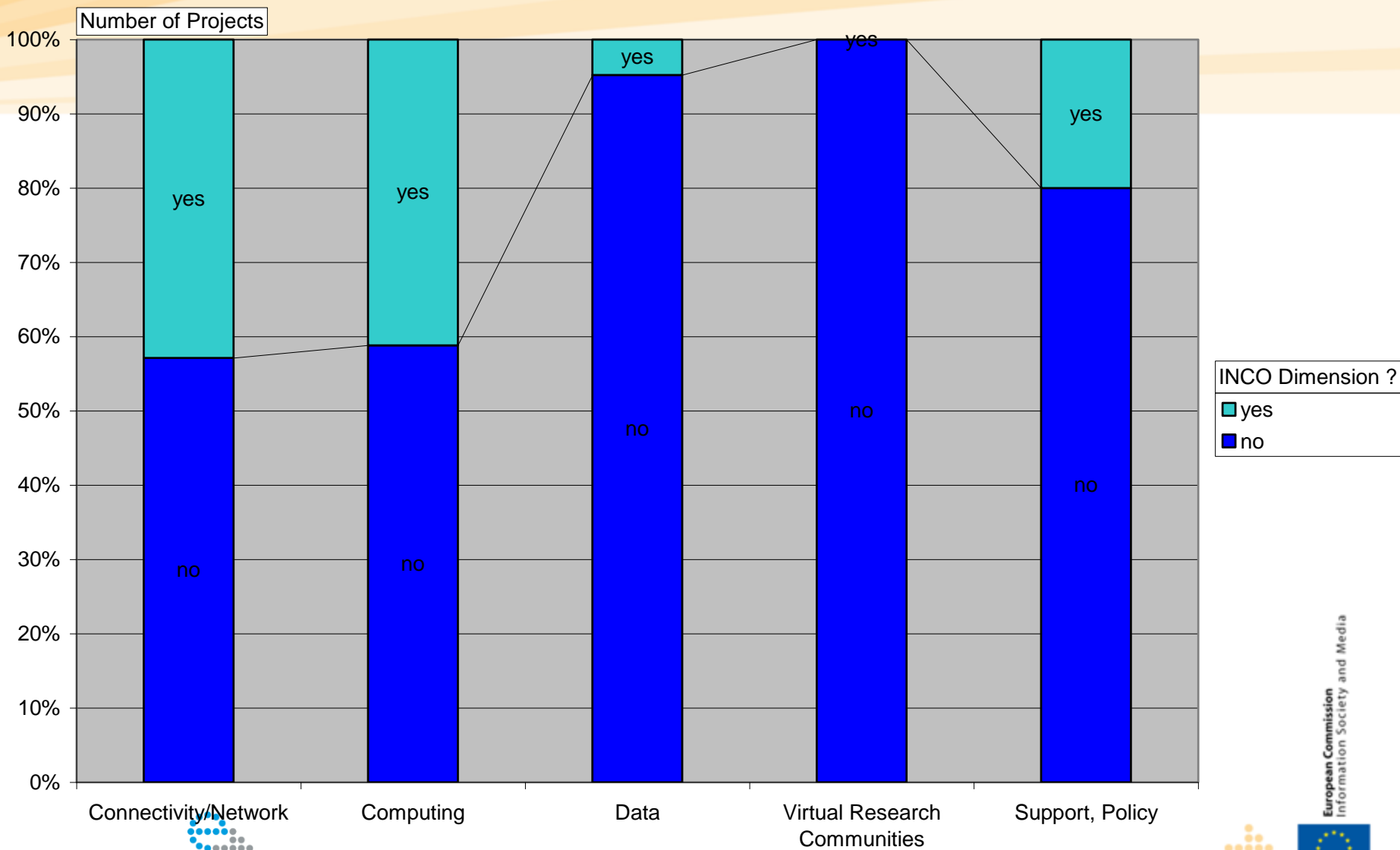# Funding per topic (FP6, FP7) (2)

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Support to Infrastructure vs support to user communities

Support to user communities per infrastructure layer

International dimension

Main user communities supported
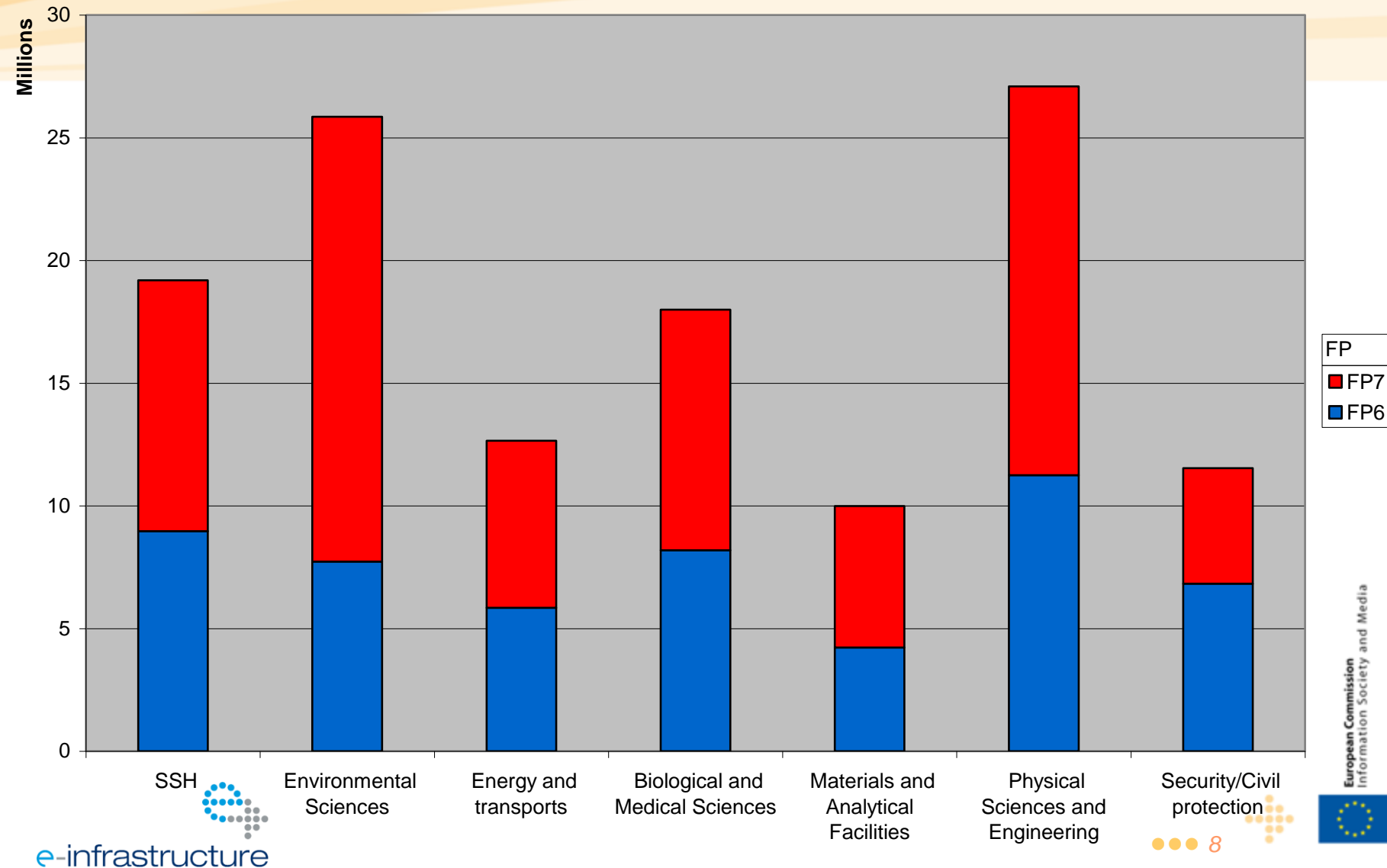
38 new projects (Call-7) currently being launched

€10M

€23M

biology · space · climatology · astronomy · geosciences · physics · fusion · environment · spectroscopy · medical · ICT · ...

User Communities

Data layer

€12M

Simulation software & services layer

Virtual Research Communities

Computing layer: Distributed Computing & PRACE

DCI €50M
PRACE €20M

Network layer

Support actions

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New political landscape:

- Dec 2009 Council Conclusions

- EU 2020

- The Digital Agenda

Competitiveness Council Conclusions of 29 May 2009

- Highlight strategic importance of e-Infrastructures; key to overcome fragmentation and digital divide

- Member States to consider e-Infrastructures in their national roadmaps

- Commission to pursue:

    - sustainability

    - global connectivity and interoperability

    - unimpeded use

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Competitiveness Council Conclusions of 3 December 2009 (1/3)

- Recognition of Europe's high quality infrastructures such as GEANT and for e-Science (art. 5)

- Critical role of e-Infrastructures (art. 14) for
  - Scientific excellence
  - Improving accessibility
  - Transformative impact on Science (e-Science)
  - Innovation platforms and precursor markets for ICT
  - Recognition of e-IRG role

- Strategic importance of ICT for implementing the 5th freedom (art. 7)

Competitiveness Council Conclusions of 3 December 2009 (2/3)

Member States should (art. 15):

- Coordinate investments in research infrastructures in order to develop research and innovation clusters
  - FI, HPC, green ICT, nano, cognitive, photonics, embedded,…
- Foster trans-national coordination of e-Infrastructures
  - Optimise resources
  - Seamless and safe access for end users

The Commission should (art. 16):

- Propose financial incentives for jointly developing and sharing research infrastructures in ICT
  - E.g. in exa-scale computing

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Competitiveness Council Conclusions of 3 December 2009 (3/3)

Member States and the Commission should (art. 17):

- **Extend e-Infrastructures** to industrial research and innovation, to public services and SMEs
- Explore **governance models** for efficient, seamless and technologically leading public services
- Examine incentives for **pre-commercial procurement**, including for the deployment of e-Infrastructures
- Better coordinate efforts and develop/share strategies in key areas such as [...] the GEANT network; avoid fragmentation
- **Pool investments** in HPC **under PRACE**
  - ...use, development and manufacturing
- Major research infrastructures to enjoy e-I support
- Broaden **access to scientific data** and open repositories and ensure **coherent approach to data access and curation**

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Summary of conclusions

➔ National roadmaps for research infrastructures

↗ Trans-national coordination

➔ Sustainability

↗ Global connectivity and interoperability

➔ Unimpeded use

↗ Financial incentives for joint infrastructure development

➔ Extend e-Infrastructure use beyond research

↗ Governance

↗ Pool investments in PRACE

➔ Pre-commercial procurement

↗ E-Infrastructure support to major facilities

↗ Coherent approach to data

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What is the European Digital Agenda

An overarching policy framework that aims at delivering sustainable economic and social benefits from a digital single market based on fast and ultra fast Internet and interoperable applications

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Identifies 7 main areas where action is needed

1. Fragmented digital markets
2. Lack of interoperability
3. Rising cybercrime and risk of low trust in networks
4. Lack of investment in networks
5. Insufficient research and innovation efforts
6. Lack of digital literacy and skills
7. Missed opportunities in addressing societal challenges

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e-Infrastructure and clouds in DAE

Action under Research & Innovation:

"ensure sufficient financial support to joint ICT RI and innovation clusters, develop further e-Infrastructures and establish EU strategy for cloud computing, notably for government and science"

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# *Next funding opportunities for e-Infrastructures in FP7*

RI WP2011 (e-Infrastructure part) - main objectives

- **Consolidation and reinforcement**
  - **of existing initiatives (data infrastructures, HPC, user communities etc)**

- **Integration**
  - **of e-Infrastructure layers**
  - **into e-Science environments**
  - **service oriented approach**

- **Openness**
  - **to new technologies and concepts**

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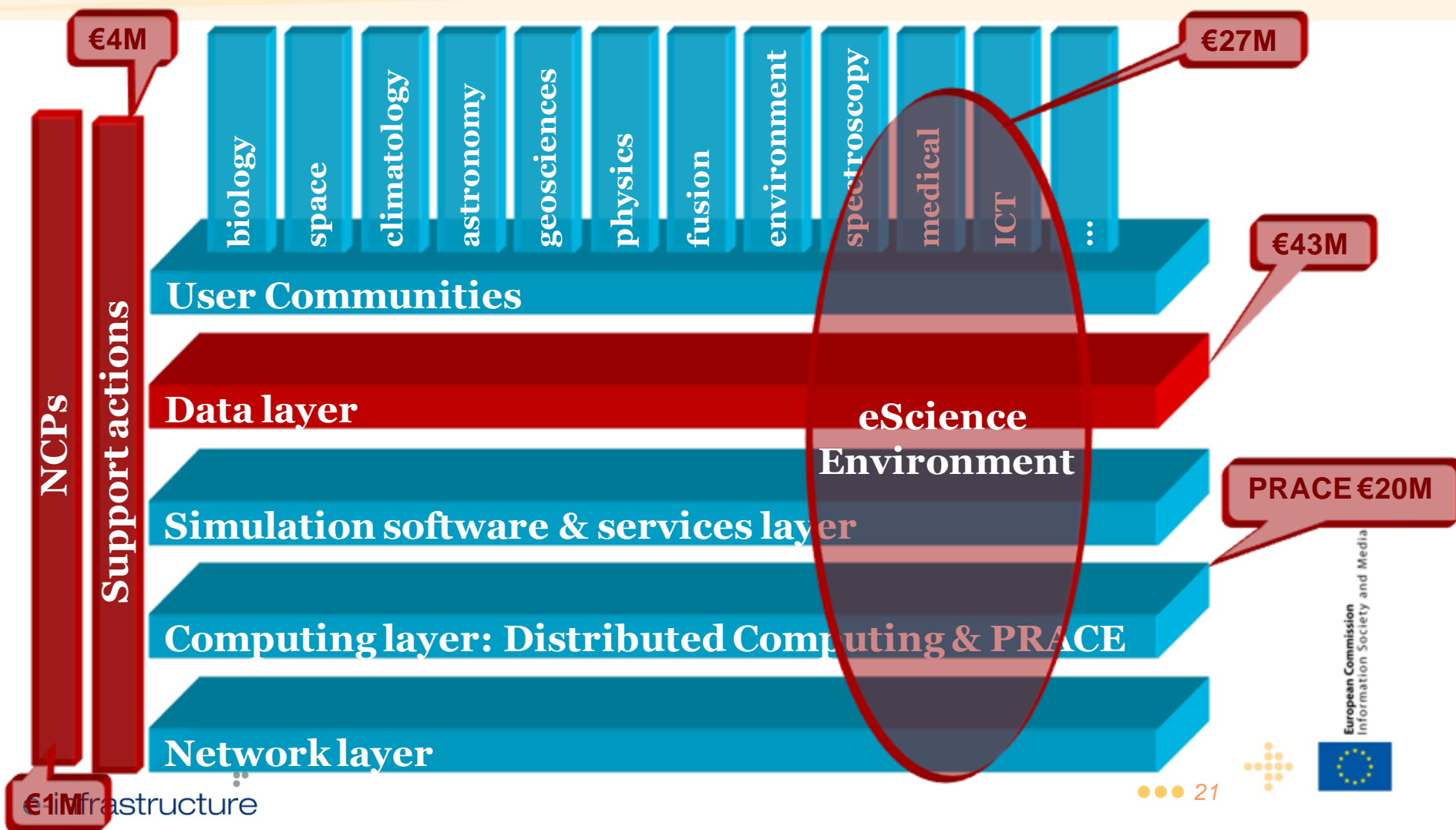
e-Science environments *(draft)* (indicative budget: €27m)

- **Seamless service provision to Research Communities**
  - network/computing/data integration; unified access
  - resource virtualisation, hybrid cloud-grid implementations
  - Pilot implementations
- **Design, development and deployment of interfaces**
  - Advanced software tools and techniques
  - Standardisation
- **Virtual facilities and testbeds**
  - Access (lower barriers, cost effectiveness, interfaces,…)
  - Composition
- **e-Science support centres and training**
  - including for ESFRI communities

Data infrastructures *(draft)* *(indicative budget: €43m)*

- **Open access infrastructures**
  - Generic
  - IPR frameworks, financing models

- **Infrastructures & policies for data generation, certification, curation, preservation**
  - Community-specific
  - Cost models for long term preservation
  - Harmonisation of metadata, semantics, ontologies
  - Interoperability

- **Service deployment for data storage**
  - Legal aspects, business models, interoperability, PPPs
  - Greening of data centres

- **Tool frameworks** (e.g. visualisation)

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High Performance Computing (HPC) *(draft)* *(indicative budget: €20m)*

- **Integration of DEISA services in PRACE**

- **Peta-scaling of applications**
  - **In synchrony with PRACE procurement plans**
  - **Led by user communities**
  - **Vendor involvement**
  - **Applications of societal relevance**

- **Prototyping of new architectures/machines**

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Support actions *(draft)* (indicative budget: €5m)

- **Laying the theoretical foundations of e-infrastructure development**

- **Involving youngsters / citizens in Science through e-Infrastructure; social and human aspects; trust**

- **Development of skills and curricula for information & data scientists**

- **Changing business models for supporting open Science**

- **Continuation of NCP network**

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ICT WP2011-12: Exascale computing objective *(indicative budget: €25m)* *(draft)*

- **Develop a few advanced computing platforms with extreme performance (100 petaflop/s in 2014 with potential for exascale by 2020)**

- **Develop optimised application codes for above systems driven by computational needs of science & engineering and of today's grand challenges (climate change, energy, industrial design & manufacturing, systems biology etc)**

- **Strong synergy with PRACE**

- **International cooperation**

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Thank you