The EGI Model –
Towards a Sustainable Grid Infrastructure in Europe

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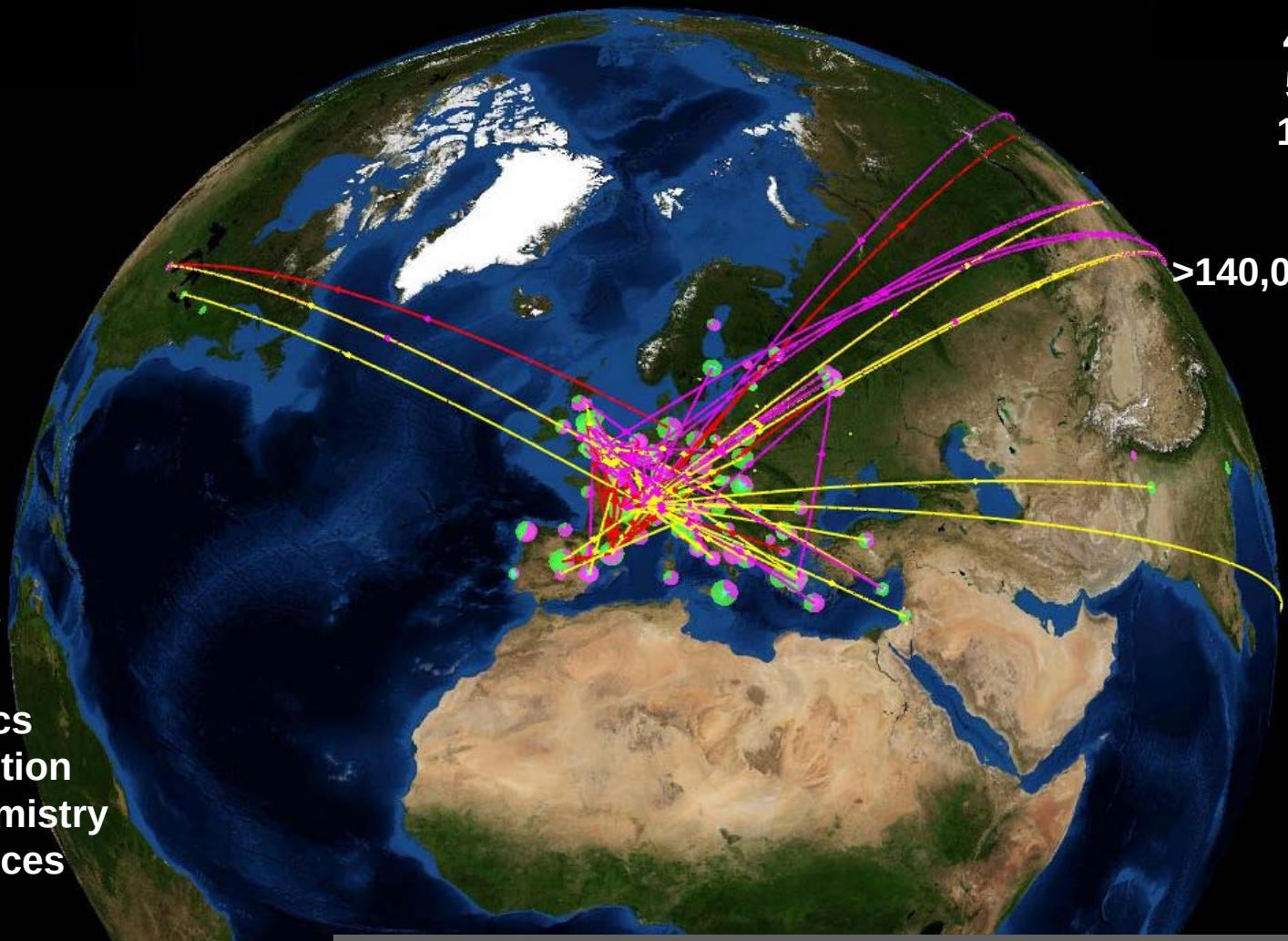
Enabling Grids for E-sciencE



250 Sites
48 Countries
50,000 CPUs
13 PetaBytes
>5000 Users
>200 VOs
>140,000 Jobs/Day

Archeology
Astronomy
Astrophysics
Civil Protection
Comp. Chemistry
Earth Sciences
Finance
Fusion
Geophysics
High Energy Physics
Life Sciences
Multimedia
Material Sciences
…

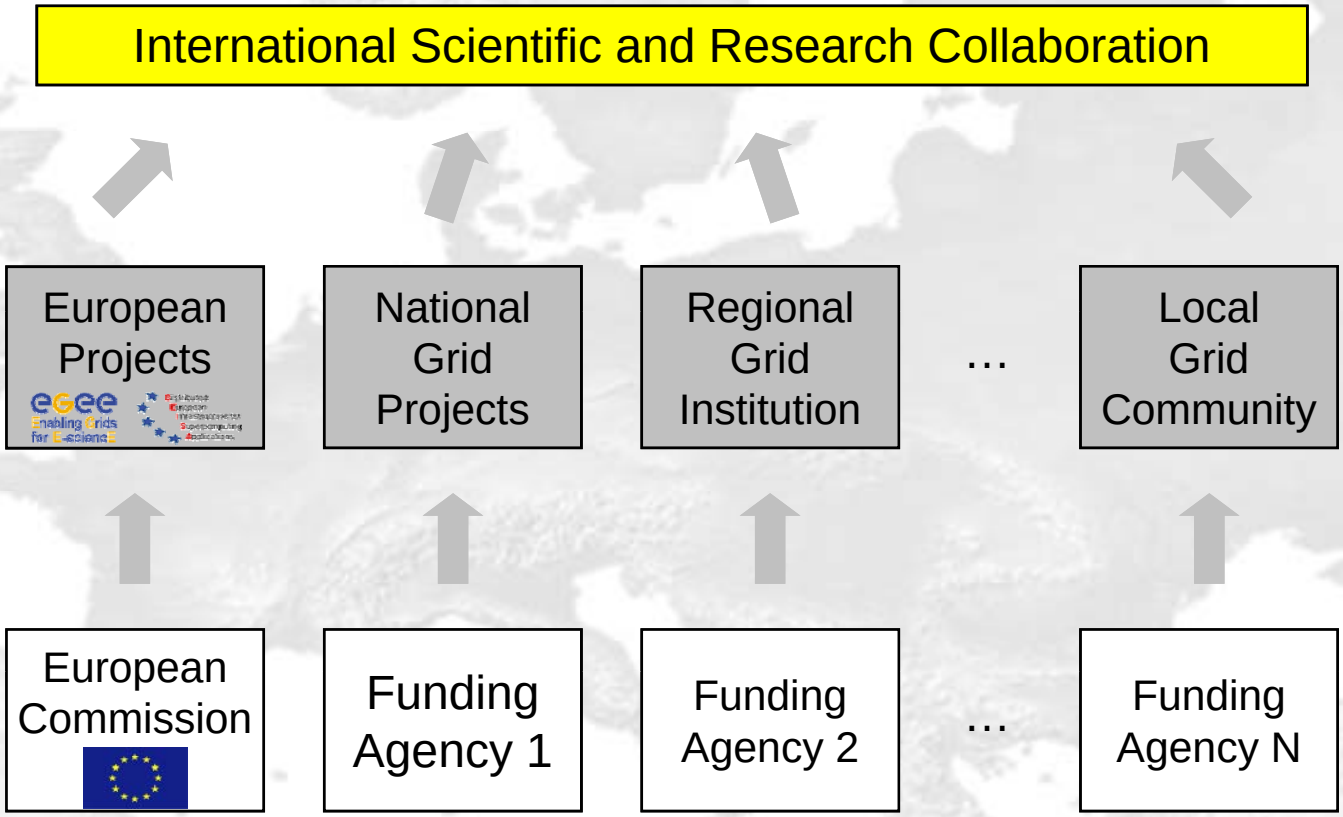
Thanks to **EGEE** (and others), production grids are reality today

Today's Challenges

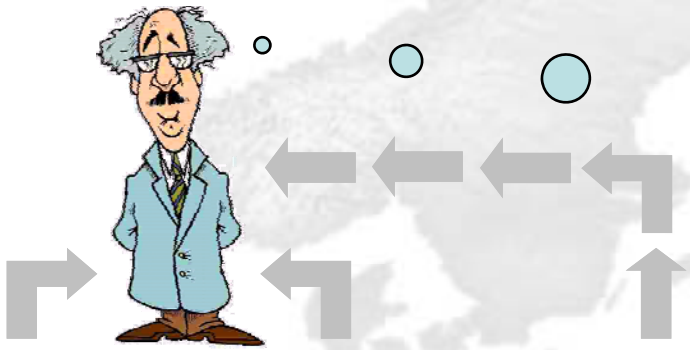
- **Project-based funding**: Typical funding cycles of today's grid infrastructures => 2-4 years
- **Protection of Investment**: Investments in grids, both from funding organizations and from users, need to be protected
- **Dependency**: Some application domains depend on production grids already today
- **Long-term perspective**: Grid users ask for a longer term perspective

Grid Stakeholders Today

Grid Stakeholders Today



Grid Users Today



- Dependency
- Protection of Investment
- Long-term Perspective

European Projects

National Grid Projects

Regional Grid Institution

…

Local Grid Community

European Commission

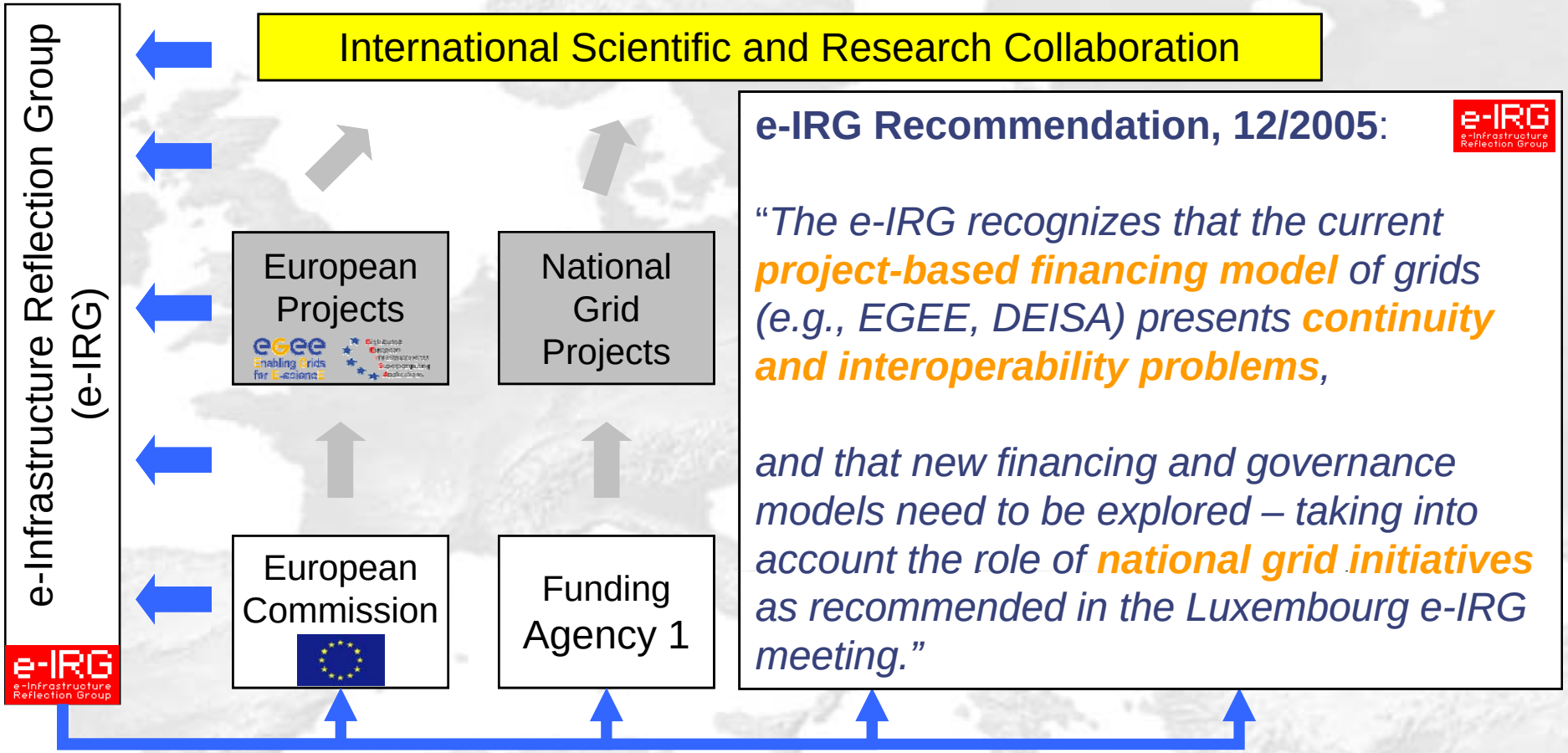
Funding Agency 1

Funding Agency 2

…

Funding Agency N

Grid Stakeholders Today



Grids in Europe

www.eu-egi.eu

Each NGI

… should be a recognized national body

with a **single point-of-contact**

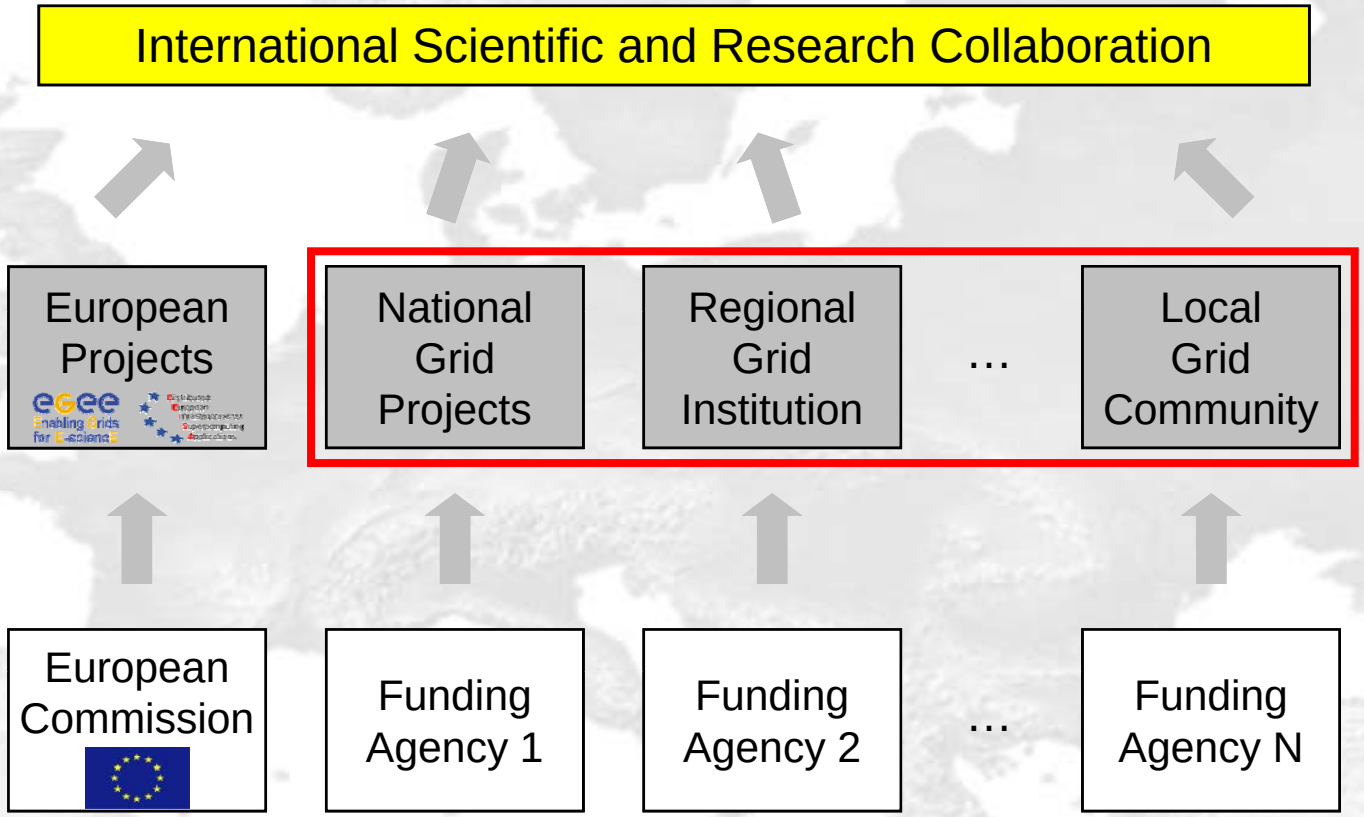
… should mobilize national funding and resources

… should ensure the operation of a national e-Infrastructure

… should support user communities

… should contribute and adhere to intl. standards and policies

Grid Stakeholders Today



Future Grid Stakeholders

International Scientific and Research Collaboration

European Grid Projects

National Grid Initiative 1

National Grid Initiative 2

…

National Grid Initiative N

European Commission

Goal of EGI Design Study:

Conceptual setup and operation of a **new organizational model** of a sustainable pan-European **grid infrastructure**

EGI_DS Deliverables

- D4.3 **Guidelines for NGIs**
  - How to set up an NGI
  - Minimum requirements for NGIs
- D4.4 **EGI Blueprint Proposal**
  - Structural outline and financing of EGI
- D3.1 **EGI Functions Definition**
  - Detailled functional description of EGI

Evolution

EGI is not a simple continuation of EGEE, but should offer a possible solution for all European Grid infrastructure projects to achieve sustainability

European Grid Initiative

Objectives:

- **Ensure** the **long-term sustainability** of the European e-infrastructure
- **Coordinate** the integration and interaction between national grid infrastructures
- **Operate** the European level of the production grid infrastructure for a wide range of scientific disciplines to link national grid infrastructures

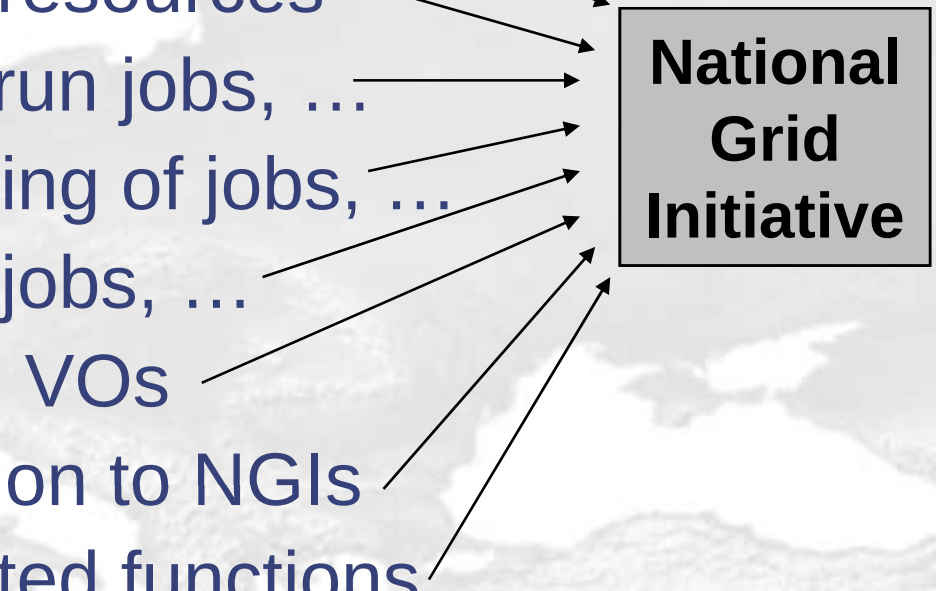
EGI Grid Infrastructure

… should be

- a large-scale, **production Grid** infrastructure
- built on national grids that **interoperate** seamlessly at many levels,
- offering **reliable and predictable services** to a **wide range of applications**

EGI Tasks

- Authentication of users
- Allocation of users to virtual organizations
- Allocation of computing resources
- Authorization of VOs to run jobs, …
- Distribution and scheduling of jobs, …
- Monitoring of submitted jobs, …
- Accounting of users and VOs
- Reporting usage allocation to NGIs
- Other centrally coordinated functions

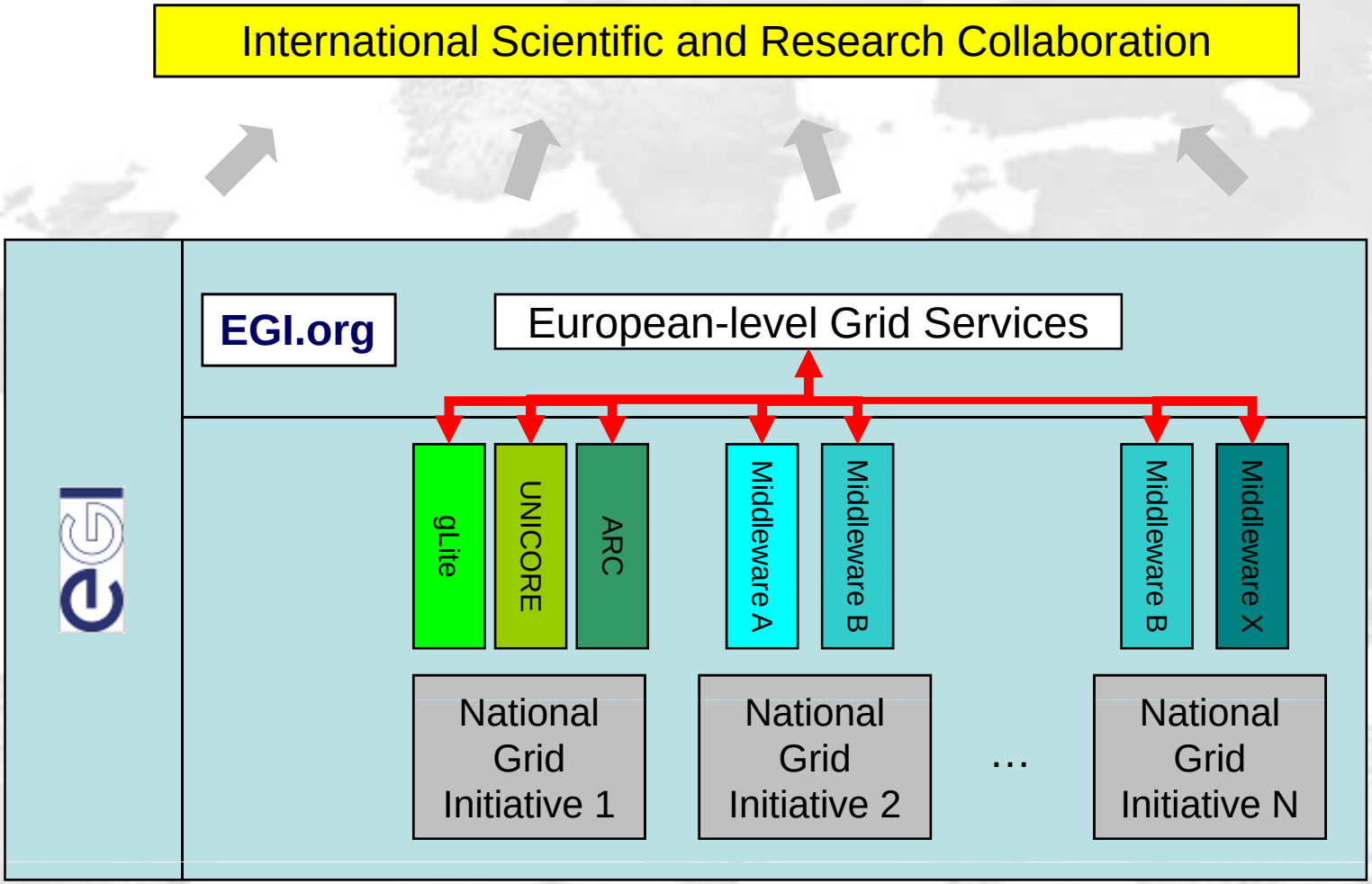


EGI Model

Building blocks:

- **NGIs**
  - ensure the operations of grids in each country
- **EGI.org**
  - central coordination part
  - the “glue” between the NGIs to link existing NGIs and to support evolution of NGIs

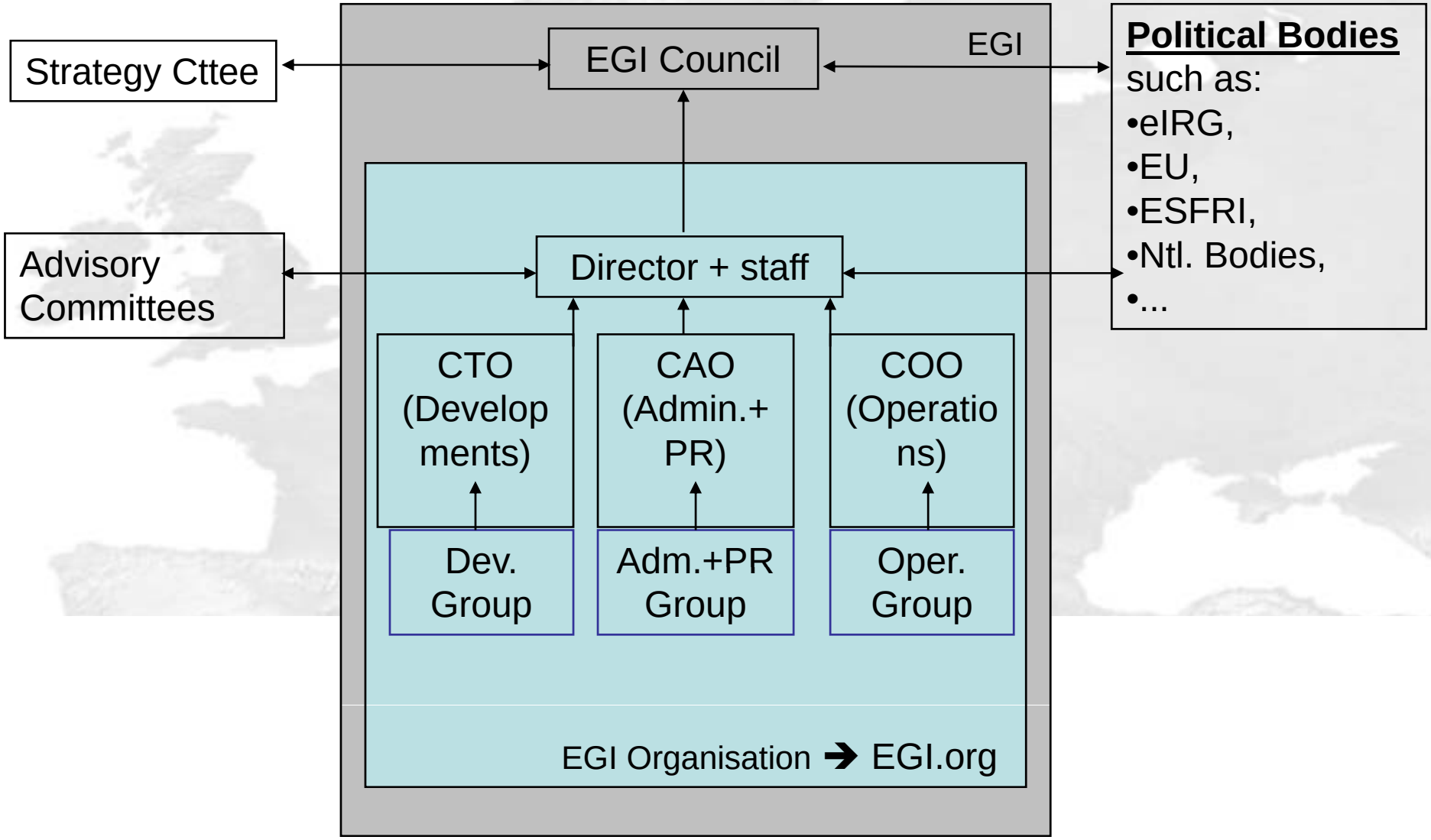
EGI Infrastructure



EGI Organization = EGI.org

- **EGI.org** does not directly own any grid infrastructure
- **EGI.org** provides central functions for
  - Management
  - Operation of the grid infrastructure
  - Middleware interfaces and certification
  - User support and application development

EGI Management Structure



External Liaison Function

- **Dissemination and outreach**:
  Content production and coordination activities
- **Other external relations**:
  - Grids outside Europe
  - Commercial grids
  - Large-scale international research collaborations
  - Networking organizations
  - Policy and standard shaping bodies
  - Private sectors

EGI Organization = EGI.org

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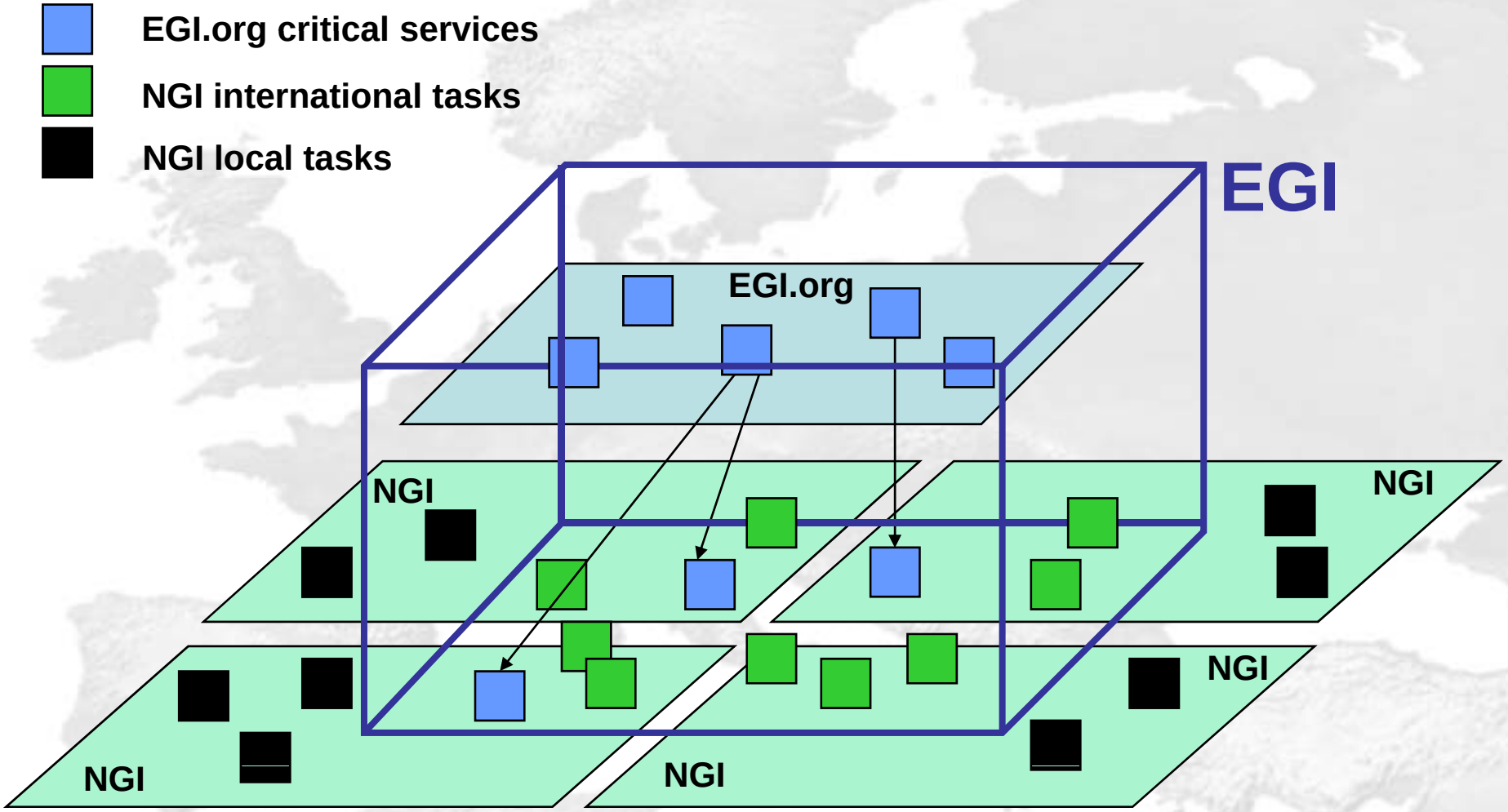
EGI Operations =
EGI.org critical services + NGI international tasks



EGI Distributed Operations Model

Requirements:

- Scalability and interoperability
- Availability and reliability
- Sustainability
- Autonomy of NGIs

EGI Operations Tasks (1/2)

- **Operation of tools and services**
  - Grid configuration repositories
  - Grid accounting repositories
  - Grid repositories for SLA compliance and performance monitoring
  - Grid operations portal
  - NGI Grid oversight
- **User support**
  - Central ticket handling system
  - Gathering requirements for user support tools

EGI Operations Tasks (2/2)

- **Security**
  - Security policy development and maintenance
  - Coordination of security and incident response
  - Expert team for security vulnerabilities in MW
- **Other international tasks**
  - Middleware deployment/roll-out and support
  - Resource allocation and brokering support
  - Interoperations between NGI's and with other grids
  - Network support
  - Definition of best practises, procedures, requirements
  - Catch-all production grid core services

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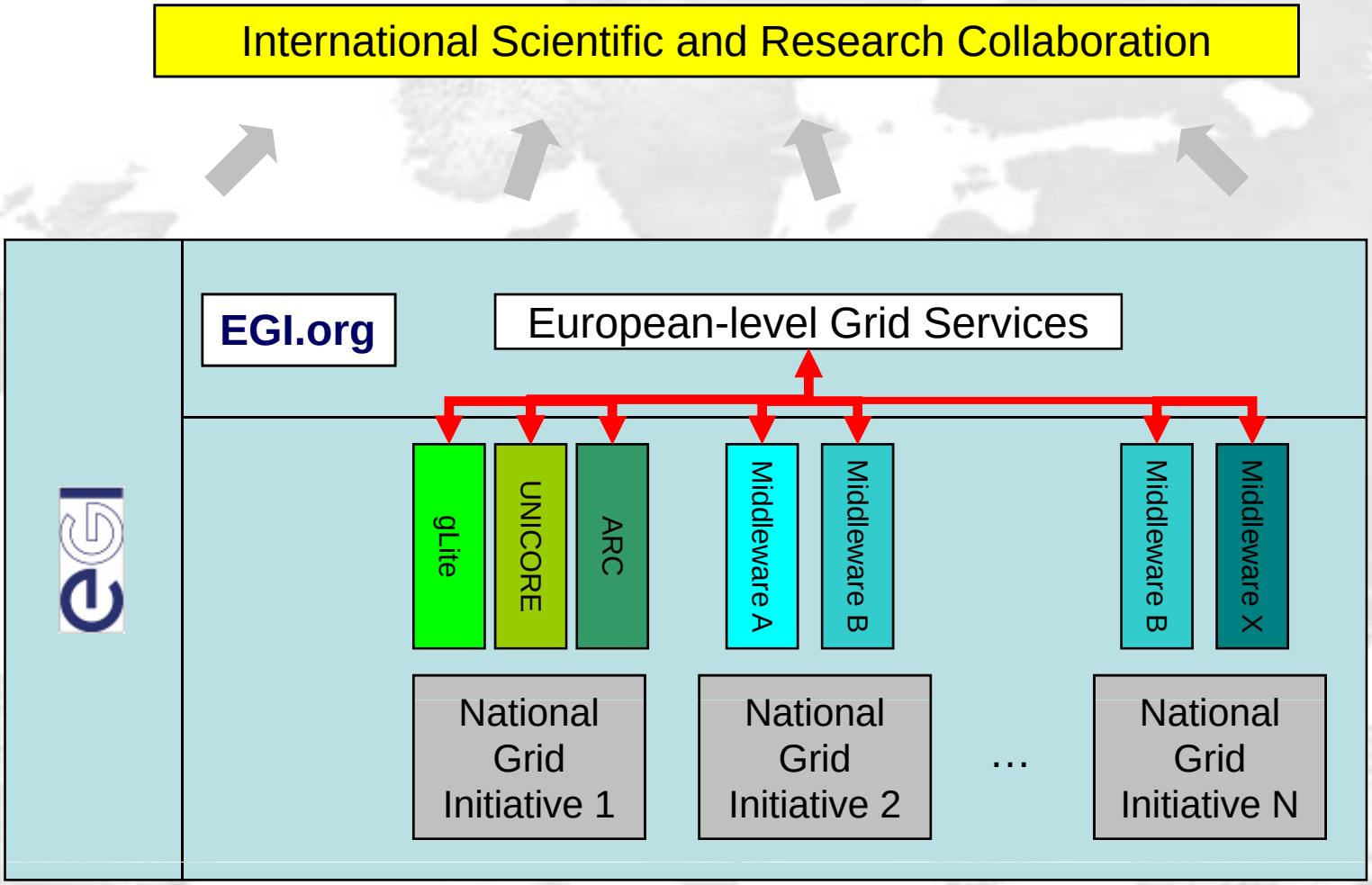
EGI Middleware

- Middleware is essential for the grid
- Middleware continues to evolve with new functionalities
- Middleware development is a long-term process

EGI Infrastructure



EGI Middleware

EGI.org

- should ensure continuity
- should steer the process of providing the necessary requirements and feedback to the middleware developers
- should certify selected components
- should promote interaction with standardization bodies

Universal Middleware Distribution (UMD)

- Proposed by the middleware consortia.
  - gLite
  - ARC
  - UNICORE
- To foster convergence of the current solutions
- Contains high quality middleware components
- Selected by a Middleware Coordination Board (MCB)

Role of EGI.org in Middleware

- Central technical coordination by EGI.org middleware unit (led by CTO)
- Objectives: EGI middleware
  - Procurement
  - Maintenance
  - Support
  - Certification
  - Establishment of common requirements for interoperability and new developments
- No development of middleware within EGI.org

EGI Organization = EGI.org

- **EGI.org** provides central functions for
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EGI Application Support & Training

- Goal: To provide significant added value for existing and new applications

EGI.org:

- Provides overall coordination point for application support and community building
  - Event organization
  - Services for new communities
  - Coordination of SSC interfacing activities
  - Grid planning
  - Training tasks

SSC – Specialized Support Centres

- Evolutionary entities to provide continued support for current and new projects
  - Reducing the load on EGI.org
  - Allowing NGIs to support their interests
  - Hosted by the NGIs close to the user
  - Manpower provided by NGIs with EC co-funding
  - Formation of SSC carried out under assessment by EGI governing bodies

EGI Organization = EGI.org

- **EGI.org** provides central functions for
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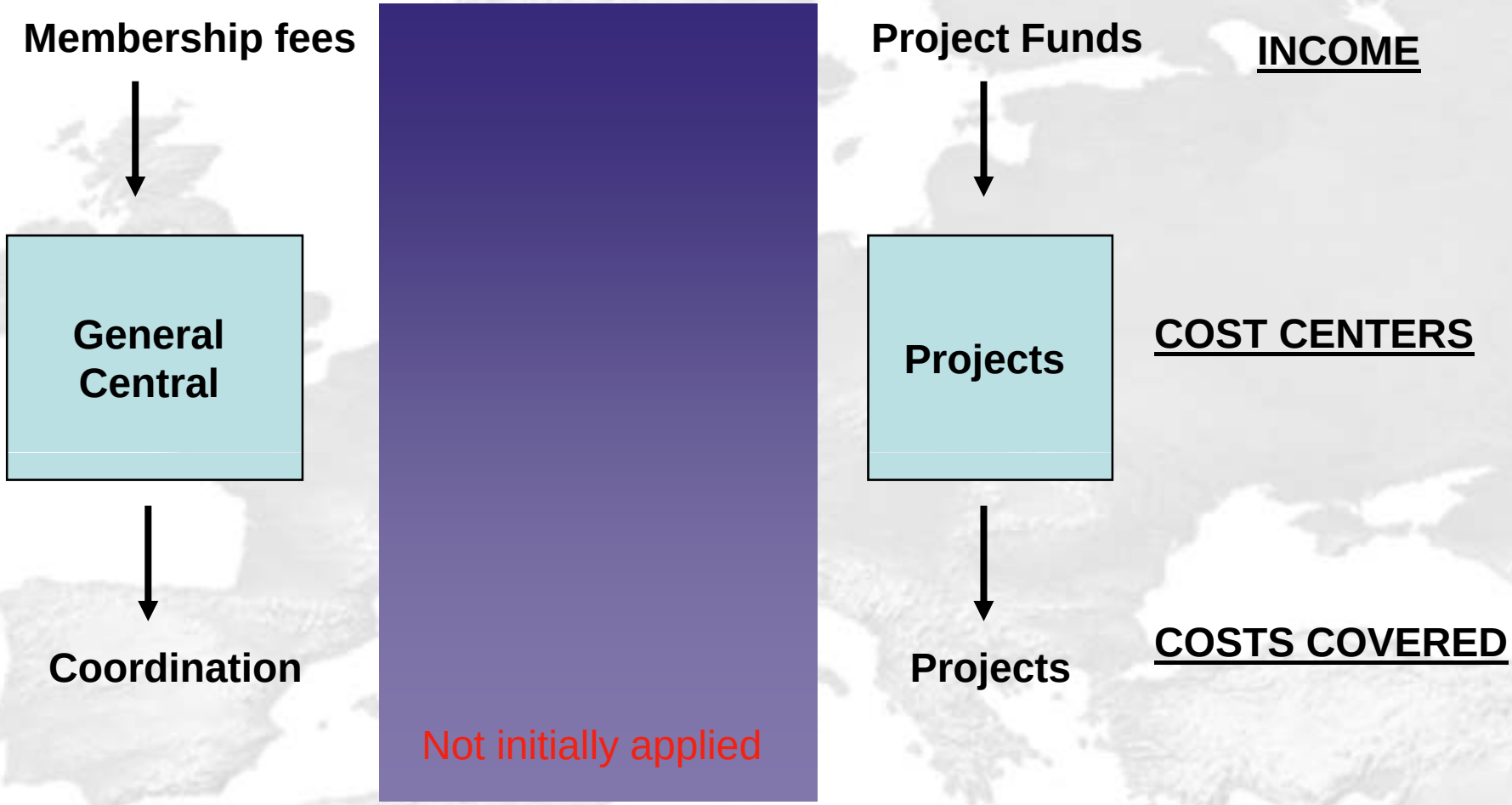
EGI Funding Model



EGI Financing

3 Sources:

- National funding of national grid infrastructure and resources
- EC funding ensuring coherence across NGIs to create the European grid infrastructure
- Project oriented funding, focused on short-term specific goals

Estimate:

- 90 MEuro/year for 900 FTEs
  (incl. less 5 MEuro/year for EGI.org)

Resources for EGI.org

Costs for	EGI.org Costs (in FTE/a)
Operations	17
Middleware interfaces and final certification	8
Application Support and training	12
External functions	4
EGI.org Management and Administration	10
Total	**51**

For details see EGI Blueprint Proposal
http://www.eu-egi.eu/blueprint.pdf

EGI – European Grid Initiative

- **EGI** consists of NGIs + EGI.org
- **EGI.org** represents the **“Glue”** between various grid communities in Europe and beyond
- **Y**our input is required to define mechanisms and functionalities of EGI

Consensus is only possible
if **compromises** are made

EGI Istanbul Workshop

14:00-15:30 **Transition** Workshop Part 1

16:00-17:30 **Transition** Workshop Part 2

17:30-19:00 **4. EGI Policy Board Meeting**

- Chairman Election
- Location Bidding
- EGI Blueprint Proposal

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