



GÉANT2 Developments

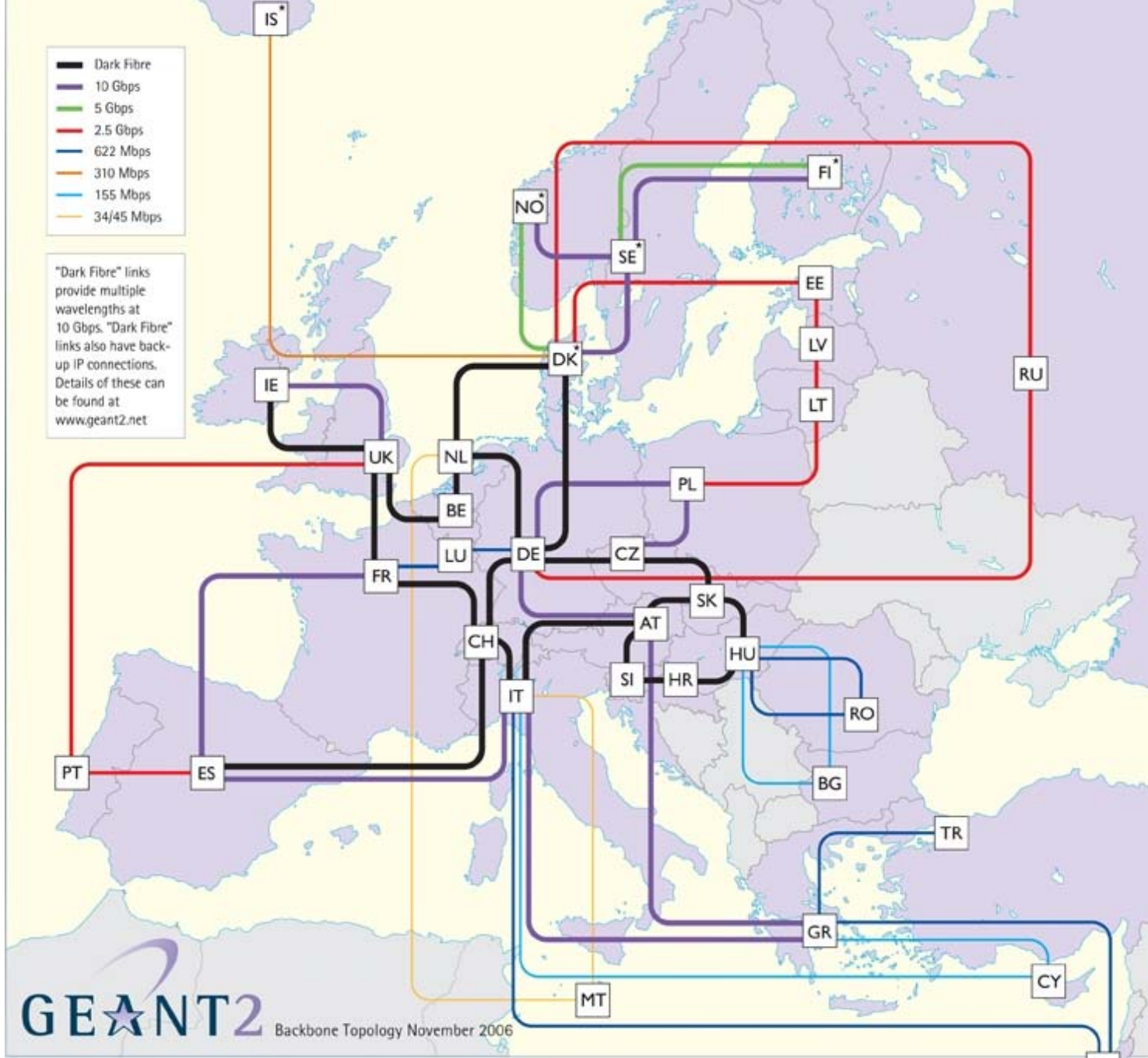
**IST EVENT 2006 Helsinki
Networking Session**

Initiative for successful dark fiber-based research networks deployment in Eastern Europe

H. Döbbeling, DANTE, 22.11.2006

- Dark Fibre
- 10 Gbps
- 5 Gbps
- 2.5 Gbps
- 622 Mbps
- 310 Mbps
- 155 Mbps
- 34/45 Mbps

"Dark Fibre" links provide multiple wavelengths at 10 Gbps. "Dark Fibre" links also have back-up IP connections. Details of these can be found at www.geant2.net



The European dimension (1)

22 PoPs, ca 200 in-line sites

38,000 km leased services

- 15 different connectivity providers
- Juniper routers
- Alcatel 1678MCC switch, 640Gb/s, VCAT, LCAS, GFP

12,000 km dark fibre with

- 6 different fibre providers
- GÉANT2 DWDM,
- Alcatel optical platform 1626 LM, 10 Gb/s, engineered for 40 WL

The European dimension (2)

GÉANT2 EC DG-INFOSOM project

Consortium of 30 (29+5) Nat'l R&E Networks

Policy Committee, Executive Committee

DANTE Ltd Project co-ordinator

GÉANT2 customers are the NRENs

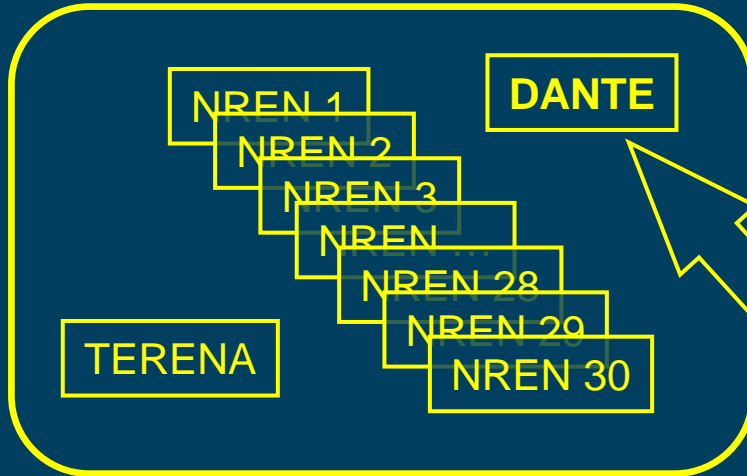
Budget ca. 45 M€ per year

ca 50% EC funding, 50% by NREN subscriptions



GEANT2 Consortium

NREN Policy Committee 30+2
GN2 Executive Committee 5+6



European Commission

DG INFSO(M)
Framework Programme 6
Directorate F3
Research Infrastructure

GN2 Contract
Communication

Procurement

European Tender

Provider Contracts

GN2 Technical Committee
Leaders of JRAs

The Market
telecom companies and
equipment manufacturers

Organisational Challenges

DANTE shareholders (15) are a subset of GN2 consortium Partners (30)

Different national funding situations

Justification for public funding

Acceptable Use Policies and Commodity IP

Cost sharing and Digital Inclusion

GÉANT2 Project Timeline

4 years, September 2004 – August 2008

Initial Tender 2004

Re-tender 2005

- transatlantic, Cyprus, Malta, PL, ES, EI

CBF 2006

Planned Re-tender end 2006

- Routers, additional areas

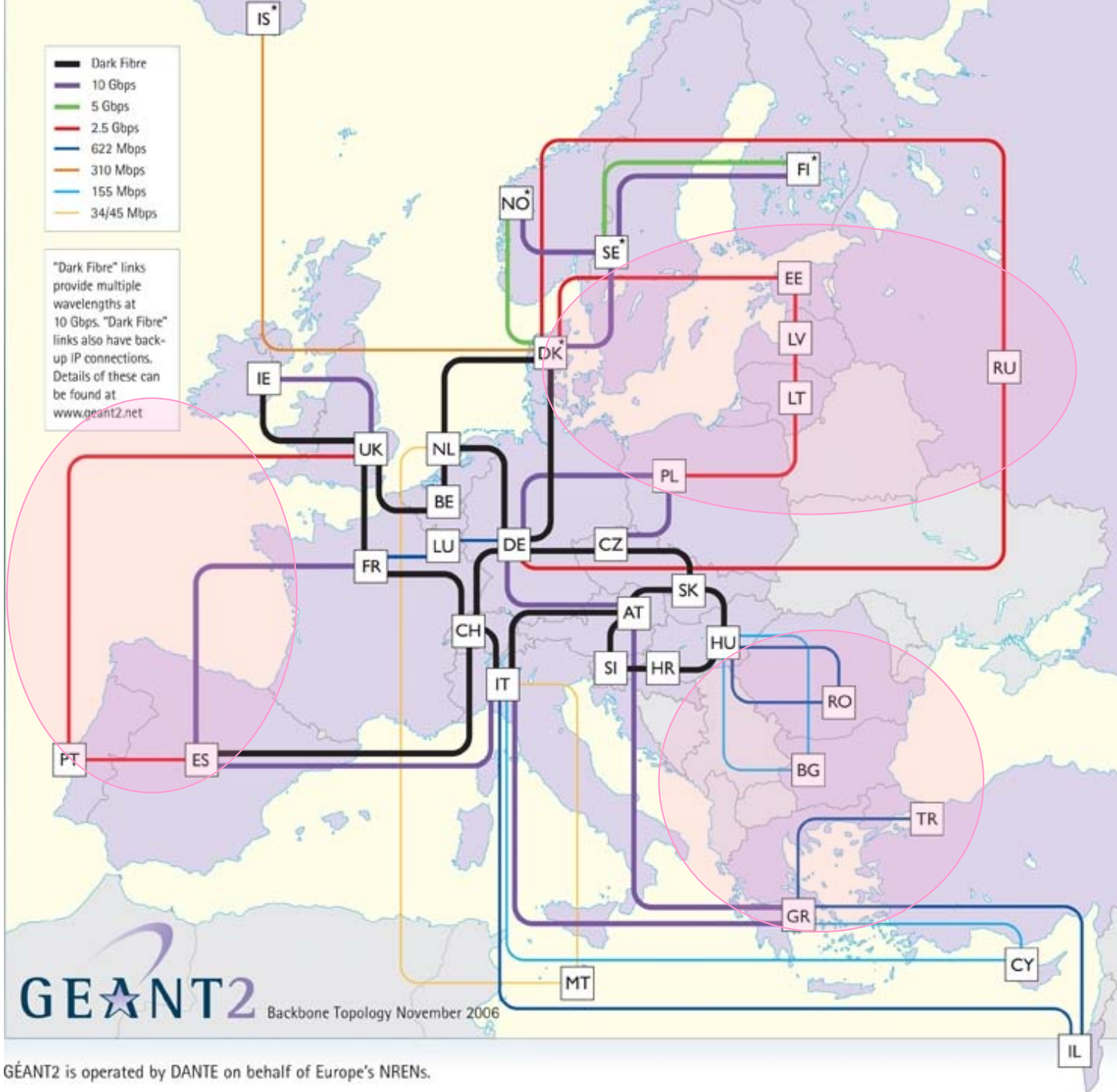
Foresight Study 2006-2007

JRAs 1,2,5 Transition to Service in 2007



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GEANT2 At the heart of Global Research Networking

- GEANT2 and NORDUnet Networks
- ALICE-RedCLARA Network
- EUMEDCONNECT Network
- TEIN2 Network
- SEEREN2 Network

www.geant2.net

- 10 Gbps
- 2.5 Gbps
- 622 Mbps
- 155 Mbps
- 8-45 Mbps
- Planned Connections
- ③ Number of Links

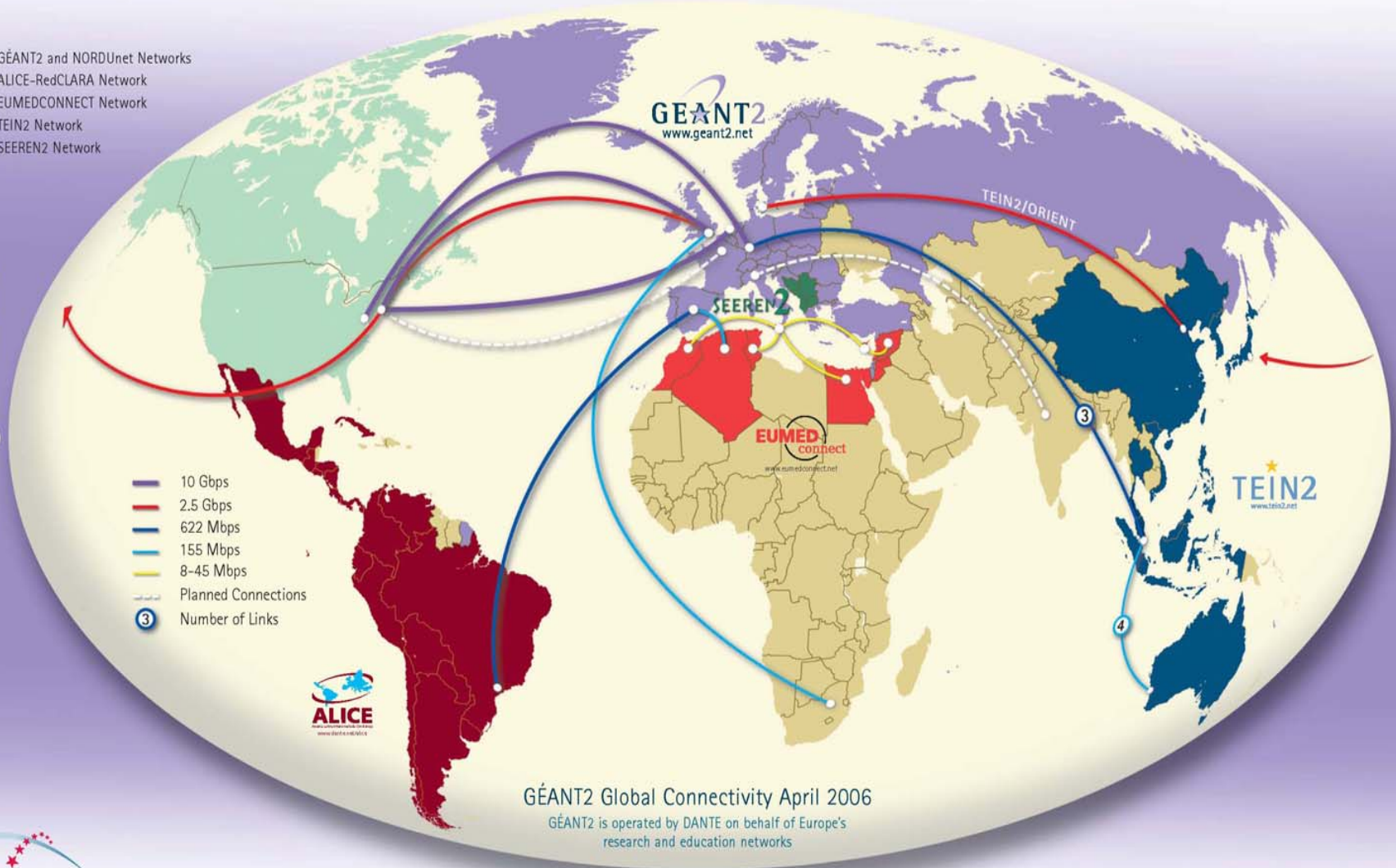


GEANT2 Global Connectivity April 2006

GEANT2 is operated by DANTE on behalf of Europe's research and education networks



★ Connect ★ Communicate ★ Collaborate



Global connectivity

- Services within the GÉANT2 cost sharing
 - Peering with Internet2, ESNET, ERNET, SINET
- Peering with AARNET, TENET
- plus
 - ALICE
 - EUMEDCONNECT
 - TEIN2
 - ORIENT
- Two paradigms for e2e circuits
 - Open Exchanges (GLIF GOLE)
 - GÉANT2 cooperation between networks (reciprocity)

Services based on Cross Border Fibre

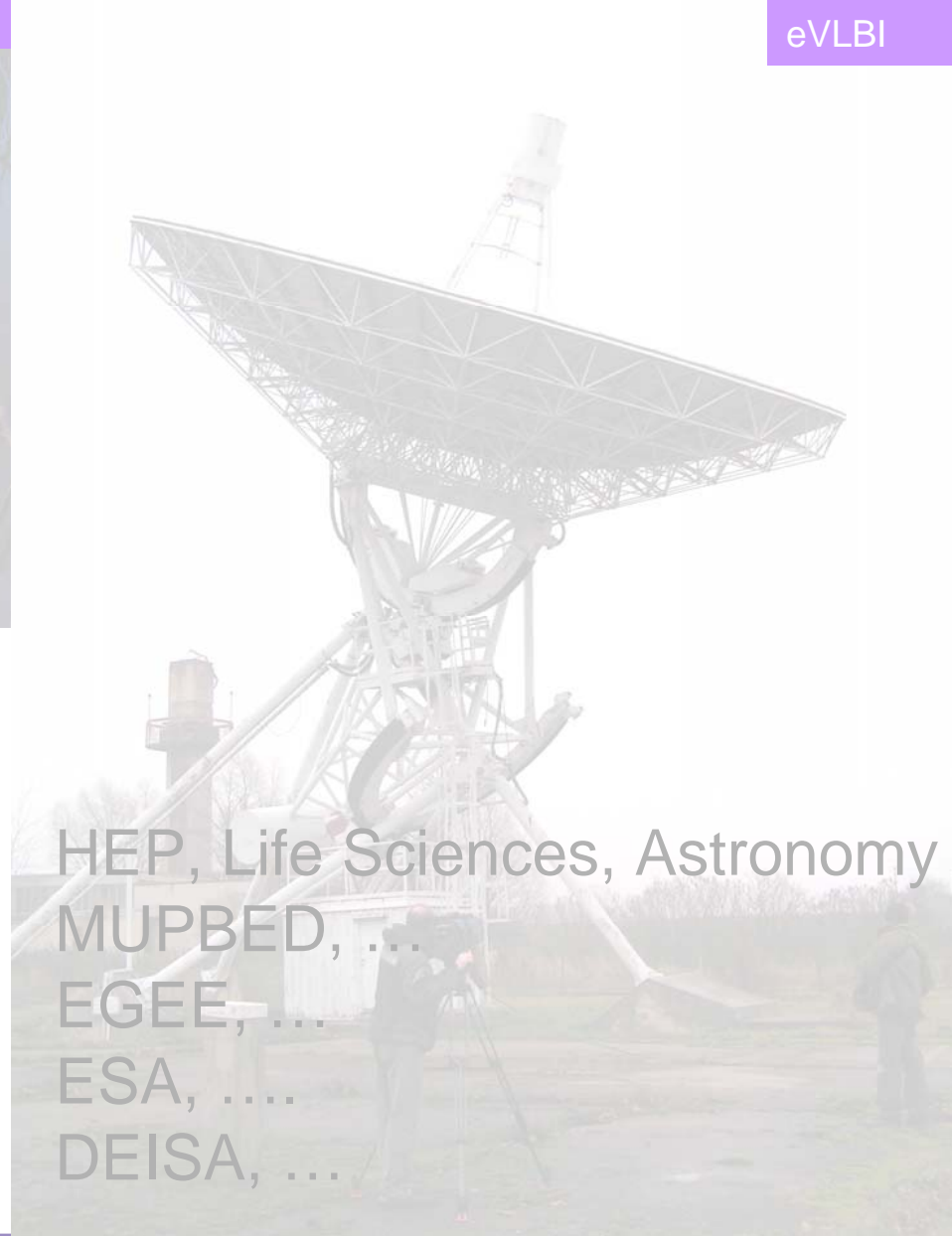
- Drivers
 - Linking existing national infrastructure
 - Economy to the Project
 - Refinement of mesh
 - Dedicated project OPNs
- MoU between NRENs and DANTE

Services Offered

- **Classical IP service**
 - GÉANT2 IP transit and global uplinks
 - Access capacity 10s of Mb/s to 10 Gb/s
- **The building blocks for overlay networks**
 - Optical private networks based on transmission wavelength (10 Gb/s)
 - Distance independent e2e wavelength pricing
 - VPNs based on GE or other capacity links
 - **GÉANT+** service
 - 10Gb/s aggregate e2e capacity



Optical Private Networks for
Scientific Disciplines
European Projects
Grid Initiatives
Distributed Organisations
High Performance Computing



HEP, Life Sciences, Astronomy
MUPBED, ...
EGEE, ...
ESA,
DEISA, ...

Joint Research Activities Transition to Service

- Performance enhancement PERT
- Multi-domain Monitoring perfSONAR
- Roaming and AAI
- Dynamic Multi-Domain Provisioning
- Security
- Test-bed, technology testing

Changing character of GÉANT

- Multi domain operational skills
- Multi platform technical skills
- One single PoP per country?
- Existing infrastructure and procurement
- One single administrative and financial entity

Enlargement of a future GN3 Consortium ?

- GÉANT2 included Bulgaria, Turkey, Russia
- SEE* projects
- Ukraine, Belarus, Moldova ?
- A single NREN entity
- Digital Divide - Digital Inclusion is policy
- Decisions in NREN Policy Committee
- Political goals, funds, European Commission
- EARNEST study