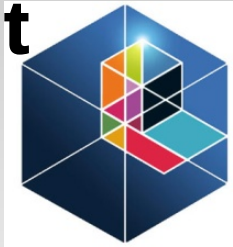
A successful model for regional development of eInfrastructures: the SEE case study



HP-SEE
High-Performance Computing Infrastructure for South East Europe's Research Communities

seera-ei
South East European Research Area for eInfrastructures

SEE-GRID-SCI
SEE-GRID eInfrastructure for regional eScience

On behalf of SEERA-EI:
Prof. Aneta Karaivanova,
Institute of Information and Communication technologies - BAS
Bulgaria

Outline

- Pan-EU eInfrastructure vision and its relationship with SEE initiatives
- Networking
- Grid
- High-Performance and Supercomputing
- Policy support and programme management

Outline

- **SEE e-infrastructure initiatives**
- Networking
- Grid
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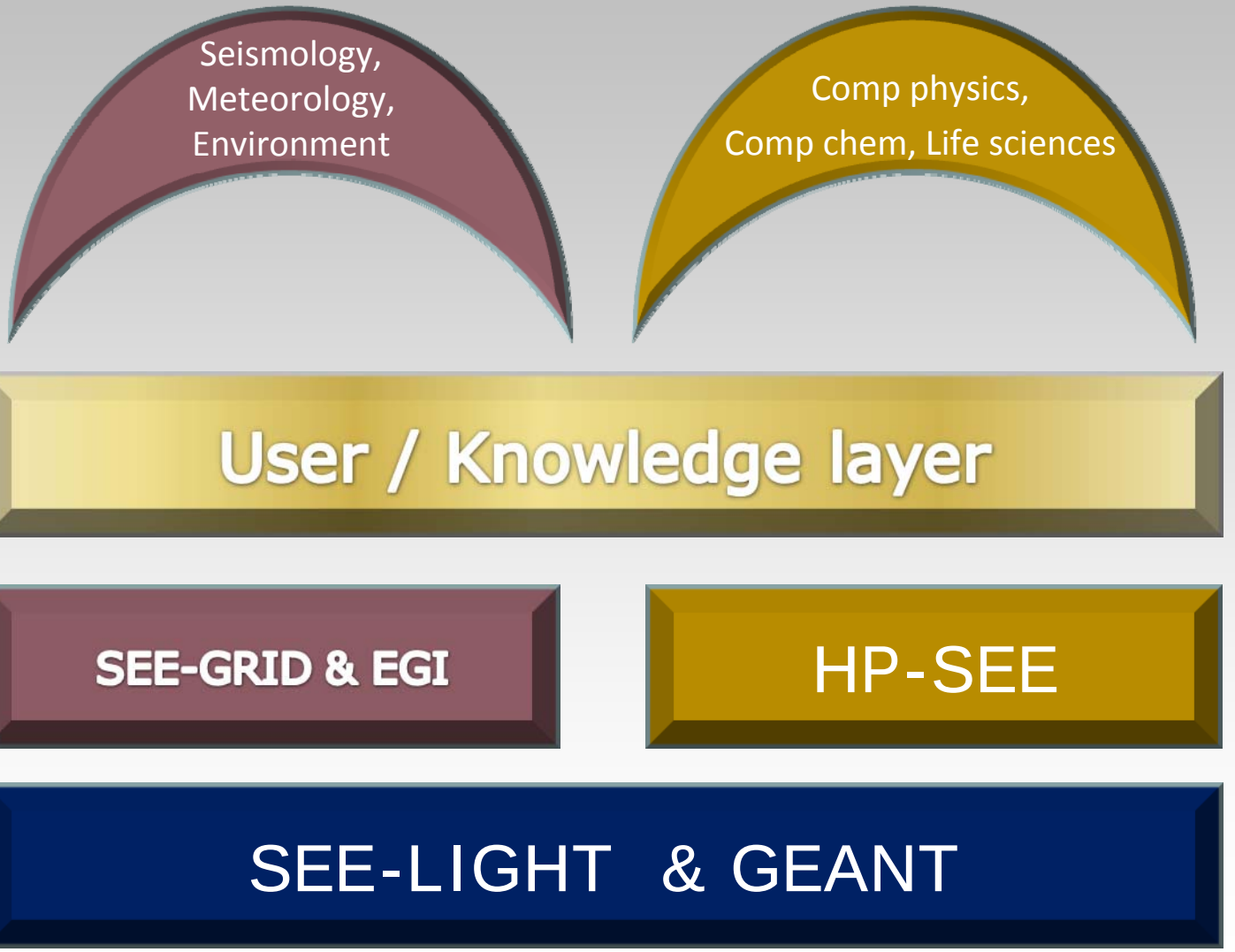
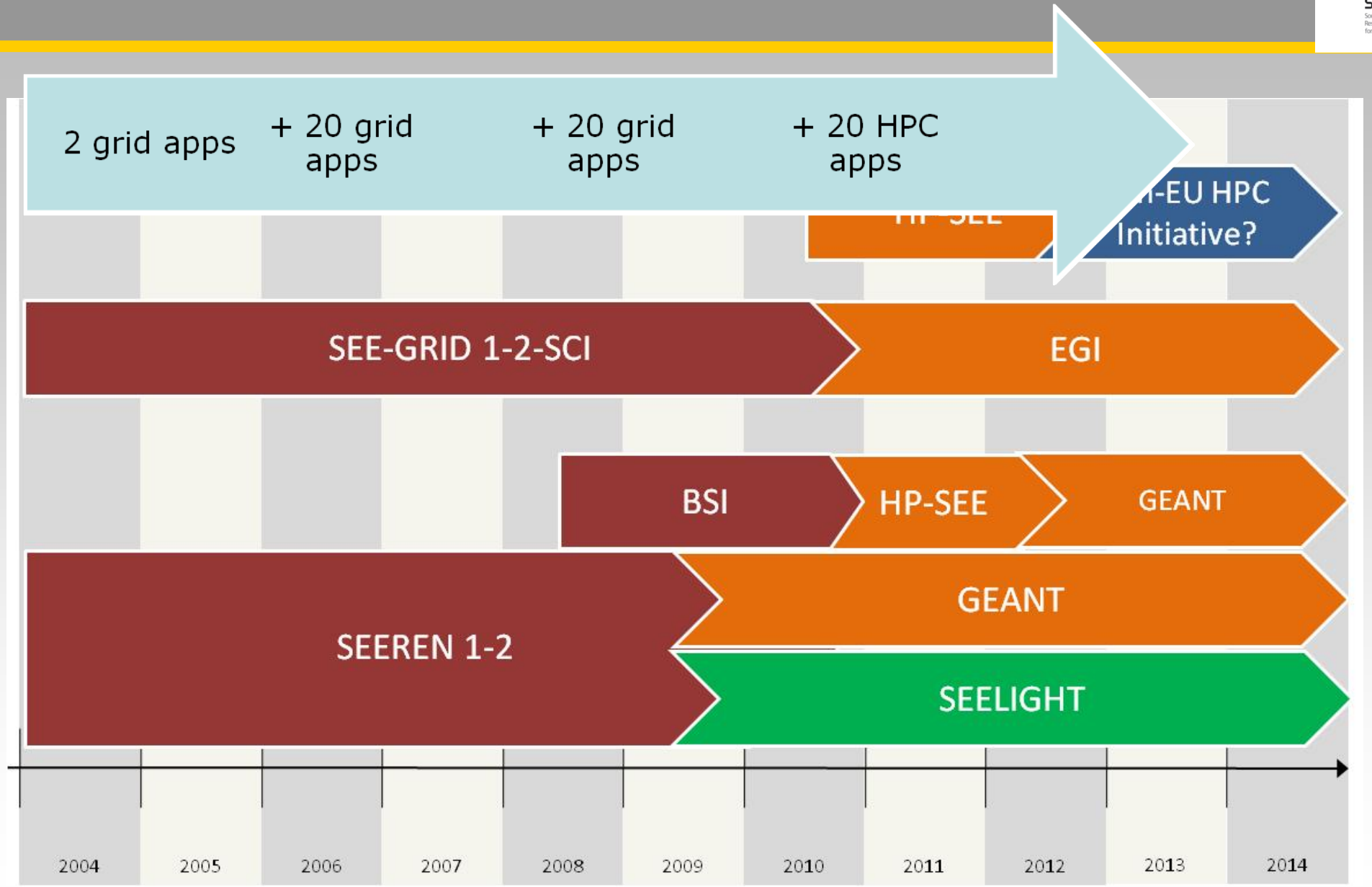
The SEE Model: Converged communication & service infrastructure for South-East Europe



The Timeline



Timeline: 6 years of close collaboration in SEE

- **SEEREN1/2:** regional inter-NREN connectivity and GEANT links [DGINFSO]
- **BSI:** Southern Caucasus links [DGINFSO]
- **SEELIGHT:** lambda facility in SEE [Greek HiperB]
- *Result: partly sustainable national & regional networks, EC funding for GEANT like rest of EU (50% national funds)*

- **SEEGRID1/2:** regional Grid infrastructure within and beyond EGEE, building NGIs and user communities [DGINFSO]
- **SEE-GRID-SCI:** eInfrastructure for large-scale environmental science user communities. Inclusion of Caucasus. [DGINFSO]
- *Result: partly sustainable national Grids, EC funding for EGI like rest of EU (with 75% national funds)*

Timeline: 6 years of close collaboration in SEE

- **HP-SEE**: regional HPC interconnection and 2nd generation Caucasus link (50% EC)
- *Expected result: sustainable national HPC centers, long-term sustainable (hierarchical) model with PRACE and DEISA, mirroring GEANT/EGI?*

- **SEERA-EI:** regional programme managers collaboration towards common eInfrastructure vision, strategy and regional funds [DGRTD]
- *Expected result: ensuring long-term national-level funds and regional funds to complement EC funds*

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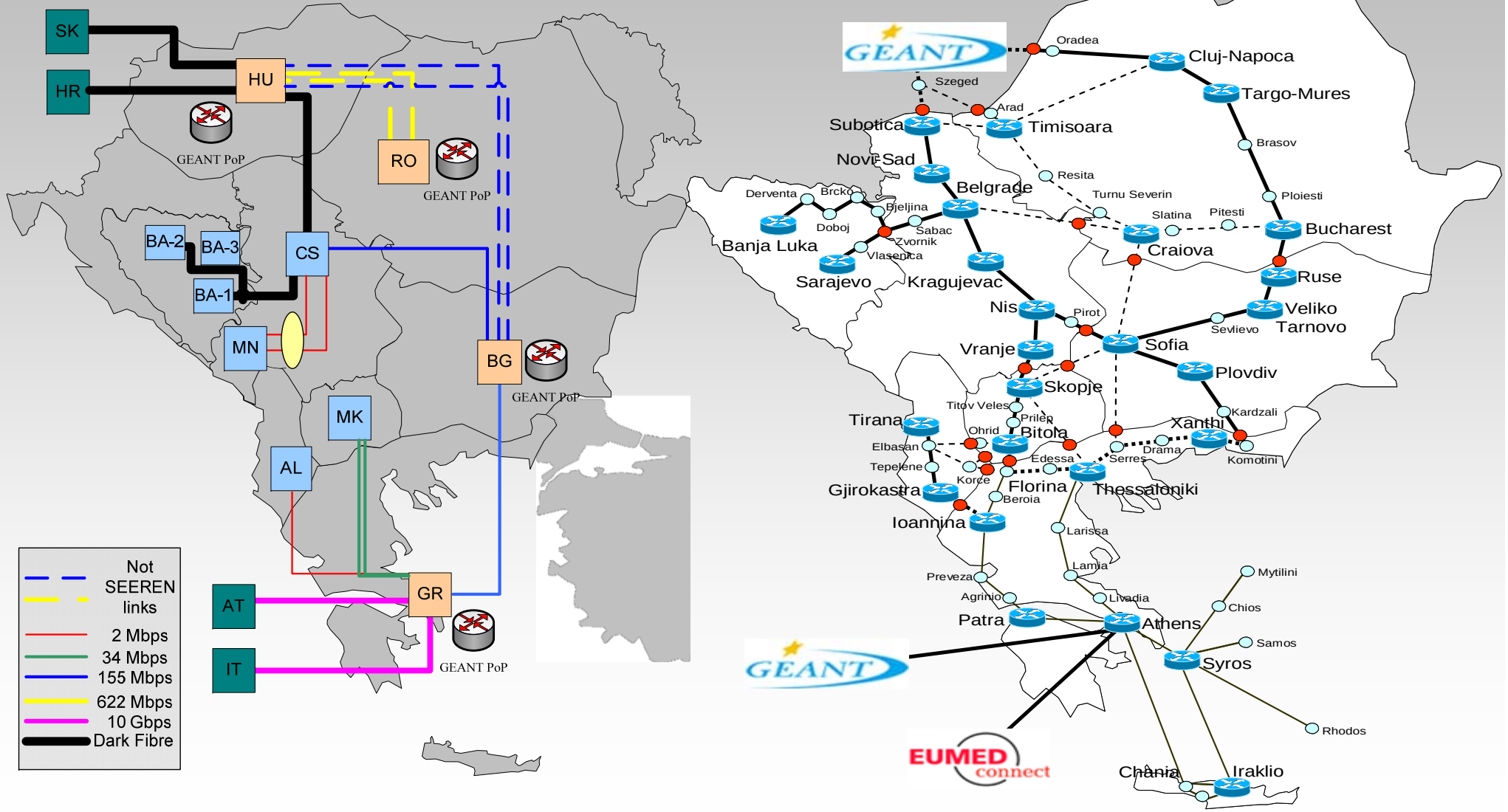
Network: SEEREN2 and SEELIGHT



Network Sustainability: SEELIGHT

SEE-LIGHT: South-East European Lambda Network Facility for R&E

- Deployment of an advanced regional network infrastructure (lambda network facility) for R&E, under the Hellenic Plan for the Economic Reconstruction of the Balkans (HiPERB).
- 4 countries committed, others in progress
- SEENet: a management body for SEELIGHT

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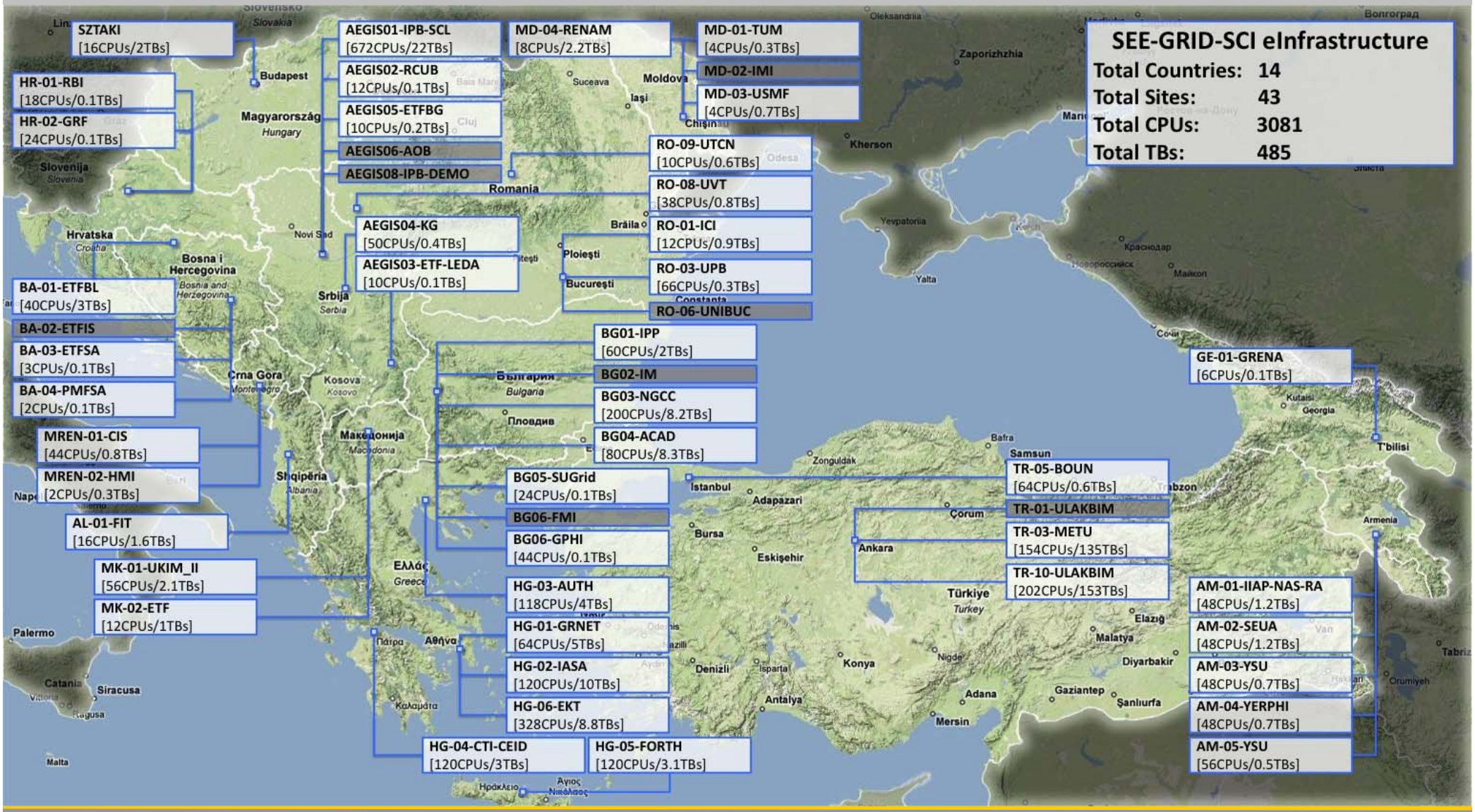
Grid: SEEGRID1-2 and SEEGRIDSCI

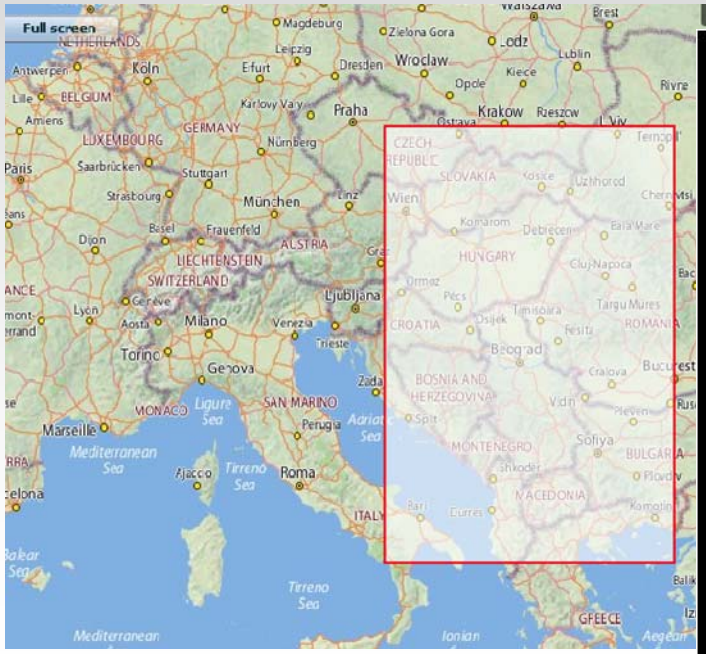


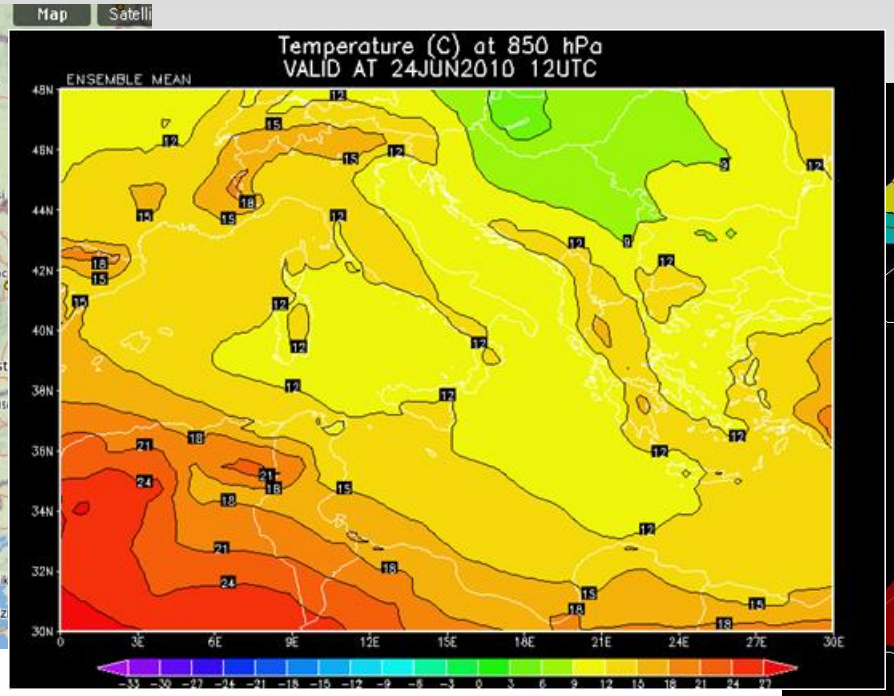
Grid Sustainability

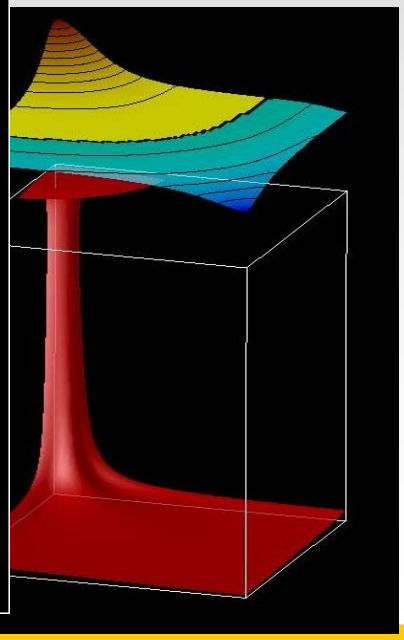
- Large infrastructure built through 3 projects
- User community buy-in secured
- National structuring via National Grid Initiatives
- All countries in European Grid Initiative, constant national-Ministerial support is necessary
- National-level projects important

Key results: User communities support

- Seismology (6 major applications), meteorology (2) and environmental protection (8); all in production
- Cross-border user communities and beneficiaries
- Clear and efficient procedures for support







Outline

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High-Performance and Supercomputing

- **Project:** High-Performance Computing Infrastructure for South East Europe's Research Communities
- **Contract n°:** RI-261499
- **Project type:** CP & CSA
- **Call**: INFRA-2010-1.2.3: VRCs
- **Start date:** 01/09/2010
- **Duration:** 24 months
- **Total budget:** 3 885 196 €
- **Funding from the EC:** 2 100 000 €
- **Total funded effort, PMs:** 539.5
- **Web site:** www.hp-see.eu

HP-SEE Partnership

Contractors (14)

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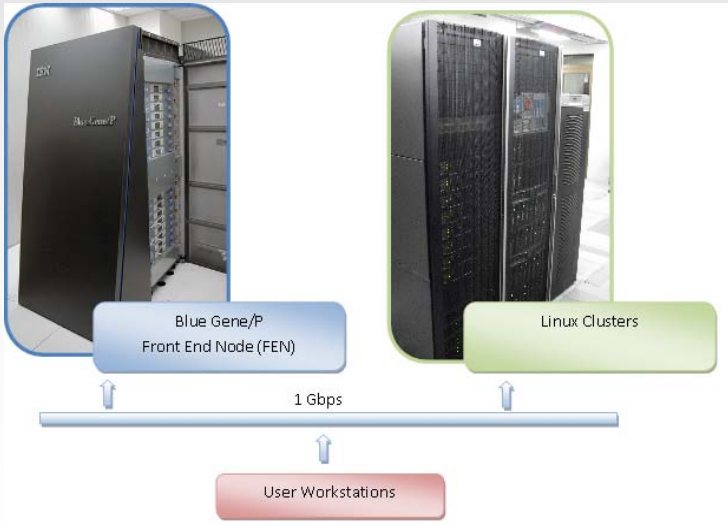
HP-SEE Project Objectives

- Objective 1 – Empowering multi-disciplinary virtual research communities
- Objective 2 – Deploying integrated infrastructure for virtual research communities
  - Including a GEANT link to Southern Caucasus
- Objective 3 – Policy development and stimulating regional inclusion in pan-European HPC trends
- Objective 4 – Strengthening the regional and national human network

Existing infrastructure – Blue Gene/P

- **IBM Blue Gene/P –two racks, 2048 *PowerPC 450processors (32 bits, 850 MHz), a total of 8192 cores;***
  - Rpeak= **27.85 Tflops;**
  - **Energy efficiency: 371.67 MFlops/W: Green top 10**
- HPC machines in Romania, Bulgaria, Hungary
- Upcoming purchases in Serbia and Greece

Country	TFlops		
	2010	2011	2012
Greece	0	40	80
Bulgaria	30	30+8 GPU	40+20 GPU
Romania	13	20+100 GPU	30+100 GPU
Hungary	1	30	60
Macedonia	0	10	10
Serbia	6	20	40
OVERALL	50	150 +108 GPU	260+120 GPU



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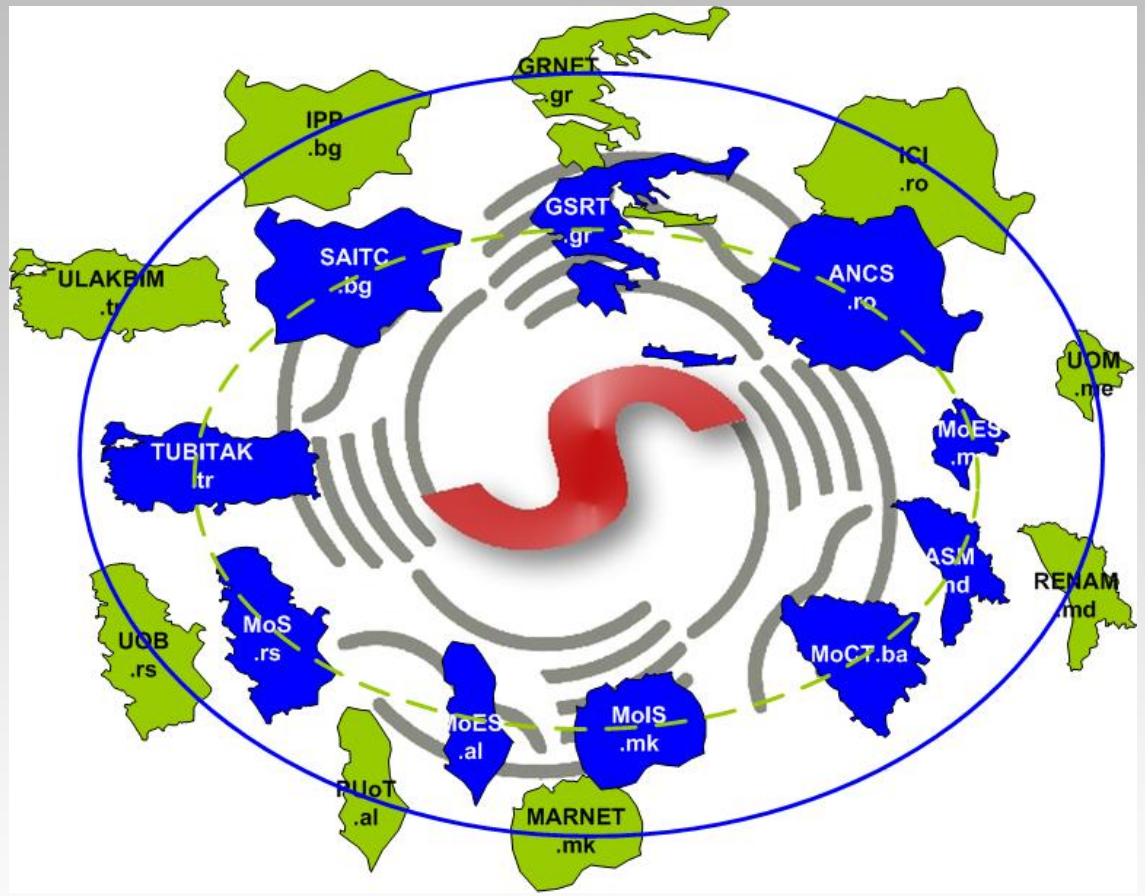
SEERA-EI: the project

- **Area:** "INFRA-2008-3.1: ERA-NET supporting cooperation for research infrastructures in all S&T fields“
- **Start:** 1 April 2009
- **Duration:** 36 months
- **Total budget:** 2 000 000 €
- **Funding from the EC:** 1 500 000 €
- **Total funded effort, PMs:** 451
- **Contract n°:** RI-228052
- **Project type:** Coordination and support action

SEERA-EI: partnership



Ministry partners + eInfra partners programme manager partners

SEERA-EI: core objective

- Core Objective – Develop and strengthen the coordination and cooperation of national eInfrastructures programmes in the region of South-East Europe.
  - The core objective of the SEERA-EI project is to engage national key programme owners in the field of Research Infrastructures (eInfrastructures) in SEE in common dialogue and planning, to establish a sustainable and sustained communication platform, and to undertake activities targeting durable cooperation in building the common regional Research Infrastructures vision, strategy and action plan.

Key results: WP2 Programme analysis

- Questionnaire for the programmes defined, and a set of related metrics (D2.1)
  - 1. State of the art of actual eInfrastructures in the region and their funding modalities (NRN and NGI)
  - 2. Data collection on actual programmes and actions
- Analysis carried out using metrics
  - eInfrastructure analysis
  - Porgramme analysis
- 23 programmes was surveyed by the questionnaire
- First round of analysis carried out in D2.3a
- The analysis points out the specificities of eInfrastructure programmes from the region, their strengths and the weakness, upon the set of related metrics
- Conclusions:
  - Ministry-run programmes are typically of higher order and more focused on general ITC sectors
  - eInfrastructure-related funding is provided as a direct funding action to NREN/NGI players, who then manage a sub-programme
  - Economical difficulties in the region are reflected by the funding of research programmes and in discontinuities.

Key results: WP3 Identification of national and regional activities

- Deliverable 3.1: “Comparative analysis of national programmes and identification of regional collaboration areas”: second round of analysis
  - identifying the gaps in eInfrastructure development and related programmes on the national level
  - identifying regional collaboration areas by means of:
    - national gap analysis,
    - regional-level gap analysis,
    - brainstorming between programme managers and eInfrastructure managers on priorities.
- Step 1: Analysis of international trends
- Step 2: National-level analysis based on WP2 metrics

Country	Programmes	National (%)	EC (%)	Other (%)	Total
GR	HellasGrid	100	-	-	2,5M€
	GRNET3	20	80	-	38,0M€
	Comp.and Entrep.	20	80	-	1,0M€
AL	Nat. Prog. for R&D	100	-	-	450,0K€
	ALBGRID	100	-	-	90,0K€
BA	e-Government	20	80	-	1,3M$
BG	Acc. IS Dev.	100	-	-	1,0M€
	BNGI	100	-	-	770,0K€
MK	MARGI	80	20	-	1,34M€
	MARNet	43	40	17	2,6M€
	E-Infrastructure	100	-	-	1,5M€
MD	NS on Build. IS eMoldova & eSci.	100	-	-	1,6 M€
	Dev. of Sci. & Tech. Supp. for IS	100	-	-	145,0K€
	SALT	100	-	-	950,0K€
	RENAM Net. Dev.	40	30	30	1,5M€
ME	NP for Sci. Res. Act.	100	-	-	1,0M€
	e-Montenegro	90	-	10	300,0K€
RO	Capacities	100	-	-	500K€-15M€
	RoEduNet2	100	-	-	N/A*
RS	AMRES	100	-	-	1,0M€
	AEGIS	100	-	-	300,0K€
	Tech. Dev.	80	-	20	2,0M€
TR	Public Invest. Prog.	100	-	-	33,0 M€**

Key results: WP3 Identification of national and regional activities

- Step 3: Gap analysis and priorities (national and regional)
  - Accessibility
    - Access to resources
    - Ease of use (Openness)
  - Reliability
    - Technical
    - Organizational
  - Financing
    - Predictability and stability
    - Affordability
  - Engagement
    - Different disciplines
    - Education and Training
    - Industrial involvement
  - Awareness

GAP Analysis of National e-Infrastructure Programmes / Research Infrastructures								
Gap Dimensions		Network	Grid	HPC	New Technologies: Cloud/Green-IT/etc	ESFRI	ICT for IS with e-Infrastructure Components	ICT for R&E with e-Infrastructure Components
Accessibility	Access to Resources	E	E	E		G	E	
	Ease of Use	E	E	G		G	E	
Reliability	Technical	E	E	E		G	G	
	Organizational	E	E	E		G	G	
Financing	Predictability & Stability	G	G	G		G	G	
	Affordability	G	G	G		G	G	
Engagement	Different disciplines	E	E	E		E	A	
	Education & Training	E	E	E		E	G	
	Industrial Involvement	P	P	P		P	A	
Awareness		E	E	E		G	E	

Key results: WP4 Design and implementation of joint activities

- Creation of the D4.1. “Joint action plan: short term”
- 3 types of actions, 24 tasks

- Short-term actions
  - Divided in 2 groups: soft and policy-level
  - Implementation during the lifetime of the project
  - Main goal: pave the way for long-term actions

- Short-term Soft actions – 7 tasks
  - Studying national programmes and their evaluation;
  - Strengthening the bilateral relations, joint dissemination and training activities.

- Short-term Policy-level actions – 13 tasks
  - Making several joint documents such as: MoU, regional vision of eInfrastructures;
  - Study of sources for funding the regional eInfrastructures;
  - Inclusion of the SEE eInfrastructures in the national and European scientific and research policies / strategies.

Conclusions

- Regional human network is created and enlarged during the years of collaboration
- Regional technical cooperation brought forward significant results and a stable, sustainable research infrastructure
- Policy-makers collaboration is envisaged to leverage these results with concrete long-term sustainable support for eInfrastructure activities in all countries in the region; as well as regional investments and programmes