



# Perspectives of ELI for the European research

# OUTLINE

1. Why a Research Infrastructure is a good ESIF investment?
2. ELI-ERIC and its implementation through ELI-DC
3. Members of ELI-ERIC: Host and non-Host Countries.
4. Problems and requirements encountered during negotiations
5. The financial issue and the plan to reach sustainability
6. The ELI- ERIC: its tasks and organisational set-up.
7. The access to the ELI-facilities: how it will be managed
8. Other current issues: Role and scope of the ERICs, Human resources, local establishments, overlaps between national and EU legal frames, fiscal environment.....
9. Way forward and conclusions

# What is and why a Research Infrastructure?

- **A unique/rare set of facilities/instruments, for service to international researchers, built and managed for top scientific projects.**
- **Users are selected and admitted solely on the quality and challenges of their proposed projects.**
- **This allows to fully expose the instruments, the staff and the management to international competition.**
- **The flow of knowledge and know-how of about 1000 selected users/year equals to a flow of about 1 Billion euro/year.**
- **The scope of a good management is to acquire/capture part of this flow of values and provide added value.**
- **This translates into technological, scientific, educational and economic returns to the funders, the local territory, and the EU.**



# The case of ELI



- ELI is the world's **first international laser research infrastructure**, for its unique set of instruments and capabilities.
- Also the first **ERIC distributed research infrastructure** implemented in the Centre East European Countries.
- New **funding model in synergy between ESIF, national and Framework funds**.
- **ELI impacts on a strategic market, bringing its scientific and industrial core into the EU.**
- **ELI brings the EU at the centre of Laser Sciences & Technologies and the Industry in Laser systems & sources.**
- In a **market of 37.1 Bn\$ with 10%/yr growth** (Munich fair in July: 1.293 exhibitors and 32.000 trade visitors)

# New science and applications

## • Science

- Investigation of Vacuum Structure
- Electron Acceleration
- Ion sources
- Neutron sources
- Terahertz sources
- Ultrafast-laser driven X-ray sources
- Attophysics
- Nuclear & Photonuclear Physics
- Physics of dense plasmas
- Laboratory Astrophysics

## Application

X-rays => Materials Research

Medical, Materials Research

Materials research

Analytics

Micro-, Nano-Techn.

Chemistry

Mat. Res., Med., Environm.

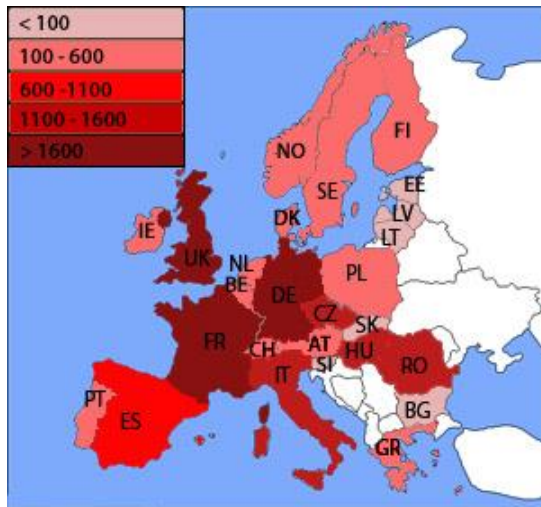
X-rays, Fusion

(from the “ELI White Book”)



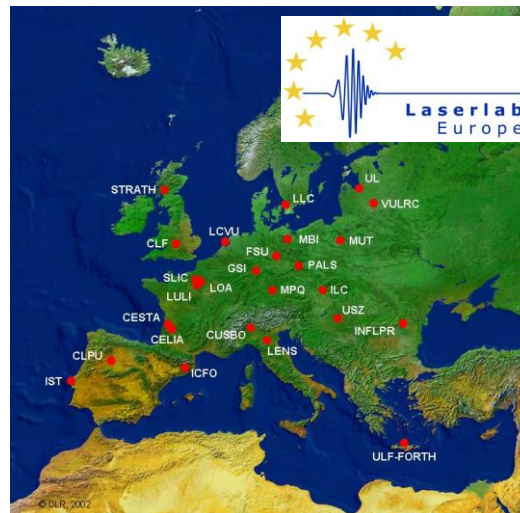
*embedded in an effective EU research landscape*

European Laser Community



The basis

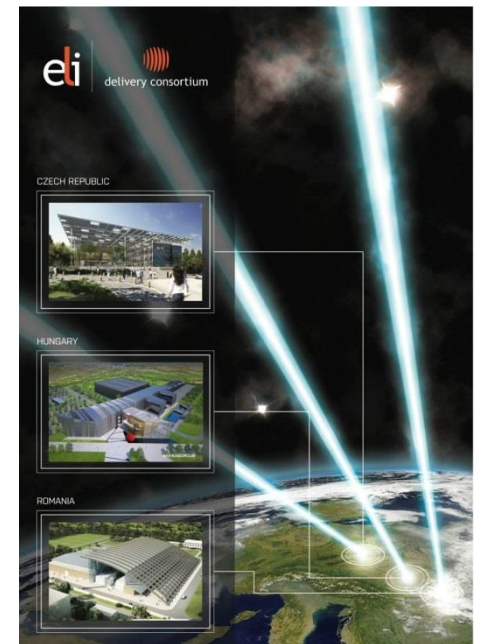
Infrastructure Network:  
Laserlab-Europe



Flexible instrument to perform and initiate new science beyond the national scale

ESFRI

Pan - European Research Infrastructure ELI

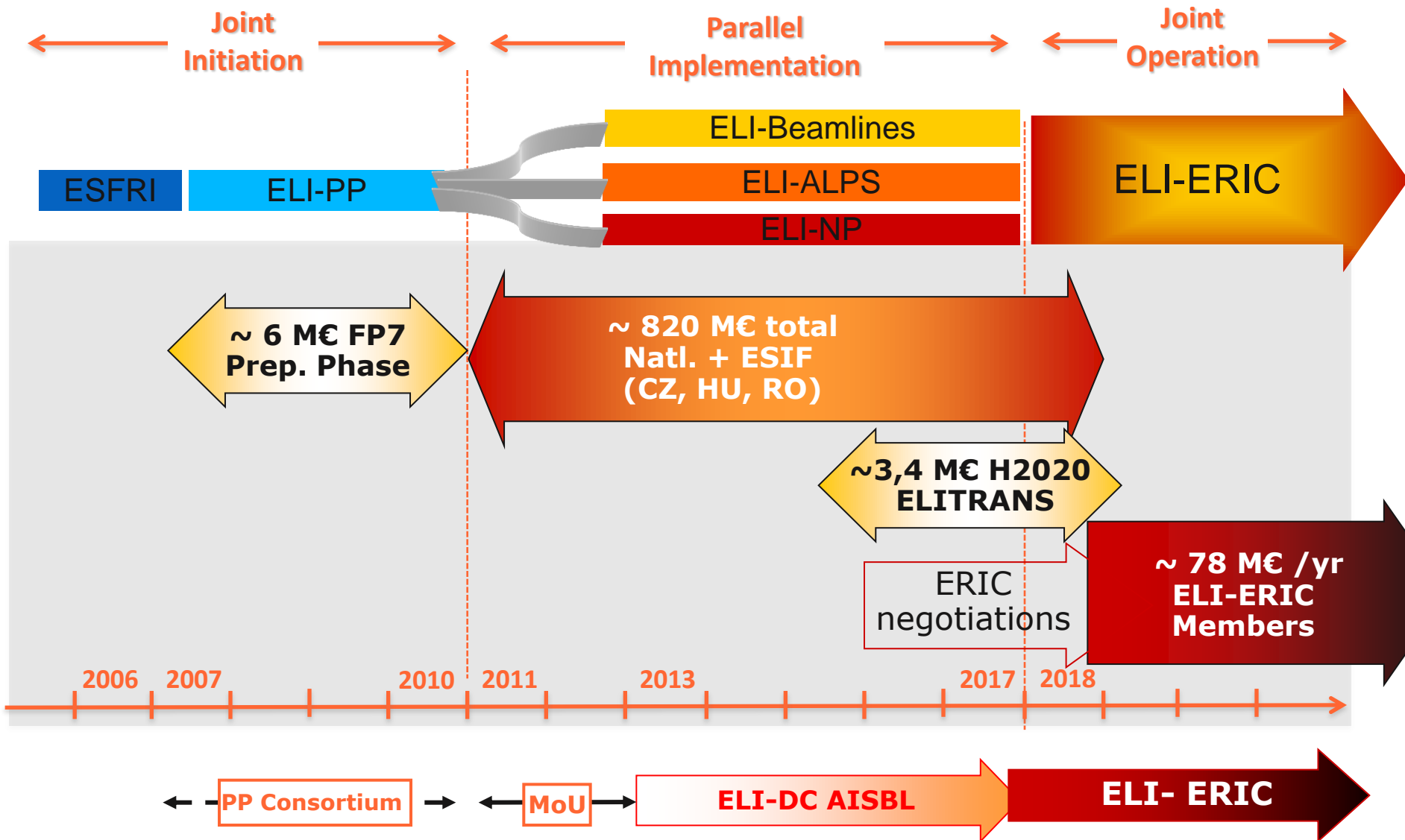


Mission-oriented entity to meet global challenges

# Milestones towards implementation

- **2006:** ELI selected as a strategic project for the ESFRI Roadmap
- **2007-2010:** ELI-Preparatory Phase (13 EU countries, €6 M€ EC funding): design indicating the implementation as a distributed RI
- **Oct. 2009:** decision to implement ELI as a unified distributed infrastructure / CZ, HU and RO propose to build the first 3 sites
- **Dec 2009:** approval by the EU Commission and strong encouragement by all EU Countries in Competitiveness Council
- **Apr 2010:** MoU between the host countries
- **2011-2018:** construction (820 M€: 15% national + 85% ESIF)
- **Mid 2013:** setting-up of ELI-DC
- **2015-2018:** ELITRANS (3,4 M€)
- **Dec 2016-June 2017:** step 1 submittal for ELI-ERIC, start of negotiations, start of ISTAC and AFC and integration of Pillars
- **? Sept 2017:** step 2 submittal ELI-ERIC
- **Dec 2018:** first call for users
- **2018 ++:** transfer of availability to the ERIC and operation

# ELI-DC and the implementation plan





End of construction for the three Pillars:

- Eli Beamlines : end of december 2017
- Eli ALPS : June – December 2018
- Eli NP : December 2018

End of ESIF financing at end of construction

- 2018: Definition of agreements to transfer availability
- Officially no commissioning (ESIF rules) but testing and first demonstration ~ 1 year, involving first users.
- Full operation in ramp-up from 2019 onwards.
- 2018-19 support of «start-up» period by Hosts+EU?
- Full contributions by non-Host to be achieved by 2020.

- Governments are the future Members of ELI-ERIC
- Around 15-20 EU Countries and some non EU Countries are potential Members of ELI-ERIC, for their Research interest
- Larger Potential Members (France, Italy, Germany and UK) in ELI-DC
- Most Research Communities have contributed and are contributing to the design and implementation of ELI (over 1000 EU researchers)
- However (as in other ESFRI projects) interconnect between Scientific Communities and Governments is not continuous
- With no commitments during construction, Governments memory of 2010 has faded, other new commitments taking front-seat
- Need to rebuild connection between Science and Governments
- Avoid mix-up EU collaboration - unilateral procurement

## With whom to negotiate and on which basis

Country	Papers published on laser-based research WORLD Relative (2015)	Papers published on laser-based research in EU, relative (2015)
AT	0,9%	2,4%
BE	0,8%	2,2%
BG	0,2%	0,5%
CH	1,6%	4,2%
CZ	1,1%	2,8%
DE	8,6%	23,0%
DK	0,7%	1,8%
EE	0,1%	0,2%
ES	2,4%	6,4%
FIN	0,7%	1,8%
FR	4,6%	12,3%
GR	0,5%	1,3%
HU	0,4%	1,0%
IE	0,7%	1,8%
IL	0,7%	1,9%
IT	3,4%	9,1%
LT	0,3%	0,7%
NL	1,3%	3,3%
NO	0,3%	0,8%
PL	1,6%	4,2%
PT	0,5%	1,3%
RO	0,6%	1,7%
SE	1,1%	2,9%
SI	0,2%	0,7%
SK	0,1%	0,4%
UK	4,3%	11,3%
TOTAL EUROPE	37,5%	100,0%
USA	16,8%	
RU	4,3%	
IN	3,2%	
CN	19,7%	
KO	2,9%	
JP	5,4%	
OTHER	10,1%	
TOTAL	100,0% (49288)	

# Members: commitments, requirements and expectations

- Host Members have reconfirmed commitment for a fully integrated RI while developing strong support to start-up.
- EU Commission has supported in synergy the design, implementation and transition towards the ERIC.
- Major Countries (FR, DE, IT, UK) are Members of ELI-DC participating in the ERIC preparation, but moving towards commitments and ERIC at different speeds (Italy, UK, .....
- Other smaller Countries ready to start effective negotiations, but waiting for «big players» to make the first move.
- Some non-EU Countries strongly interested, but asking for clear structure and set-up (and an EU single voice).

- All Members agree that contributions will be proportional to usage. Host members are adding a «site contribution».
- But budgetary constraints, and overlap with start of other RIs, is delaying, or even impeding, decisions of major Countries.
- Sharp ESIF construction-operation transition not applicable without a «start-up» & «re-training» period.
- Capability of the EU to support the start-up is limited and falls between different Directorates.
- This reflects as a pressure on defining costs and operational structure in an uncertain frame.
- The Host Countries will support the start-up for the first two years, but only if other Members commit.

# Investments and Operation, past and future (in M€)

Construction costs	ELI BL	ELI ALPS	ELI NP	ELI
<b>TOTAL</b>	277 909 341	231 411 915	310 946 690	820 267 946

## New Projects (3<sup>rd</sup> update, end September 2016)

Item	2018-2020	2021-2024	TOTAL
Lasers	33,1	53,0	86,1
Secondary Sources	28,0	46,1	74,0
Others	33,8	52,6	86,4
<b>Upgrades TOTAL</b>	<b>94,8</b>	<b>151,7</b>	<b>246,5</b>

## Operation costs, without and with taxes Estimate end-September 2016

	2018	2019	2020	2021	2022
Subtotals ELI-BL	21.982	22.473	23.804	26.183	26.856
Subtotals ELI-ALPS	13.236	17.131	22.660	23.312	24.028
Subtotals ELI-NP	23.910	25.975	25.975	26.231	26.492
<b>Operation costs TOTAL</b>	<b>59.129</b>	<b>65.579</b>	<b>72.439</b>	<b>75.726</b>	<b>77.376</b>
<b>ERIC Statutory Functions</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>	<b>1.5</b>
<b>(TOTAL operation costs including Taxes)</b>	<b>(64.518)</b>	<b>(71.779)</b>	<b>(80.396)</b>	<b>(83.909)</b>	<b>(85.808)</b>



# An outline of the present “business outlook”

Year	2018	2019	2020	2021	2022
Host Members	50-90%	30-70%	20%	20%	20%
Non-Host Members	5-50%	30-70%	70-80%	80%	80%
EU (total expected: 15-20 M€ as one off)	5-25%	5-20%	0-10%	0	0
Income from competitive projects and commercial activities	0	0	1-3%	2-5%	3-7%

**The initial stronger support by the Host Countries will allow a «ramp-up» in the Commitments by other Members, and will be recouped on the «host contribution»**

# Requirements from Members

- Basic agreement: the contributions by Members will be proportional to usage and «ramp-up» with the start
- Reliability of the overall set-up and control of the Institution: set up the ERIC asap, defining rules
- Comparability between size and quality to national facilities: definition of the users related costs
- Possibility to link Partner Facilities
- Possibility to contribute in-kind both to new developments and partly to operations
- Cost control on staff, procurement and development
- Voting taking into account size of commitments.....

# Structure and Operation

- The ERIC operates 100% of the operation time of the facilities: no reserved quotas, as in all major international RIs
- This includes open access and economic access
- Around 20% will be dedicated to R&D and will contain the applied/economic part and the expected support to competitive national training and growth, ensuring growth through excellence
- A single open access & selection system and international calls
- The operational approach will integrate the resources in the three Pillars into a Matrix approach ensuring equal engagement and internal mobility.
- Also the «statutory» functions and management will be, as all others, equally embedded in the three Pillars
- The «statutory address» will rotate every three years between the three Pillars to involve local policy makers

# Integrated ERIC model

## Governments

(direct or through RE, or Strategic Partners)

## General Assembly

Members (+ Observers+ Strategic Partners)

ISTAC

AFC

## Director General

Peer Review Panels

## Board of Directors

## Integrated functions/activities:

Statutory Users  
Scientific programmes  
Technical & Technological  
Human resources  
Legal & institutional  
Administrative & fiscal  
Financial & Fund raising

Pillar

Statutory users  
science administr.

Activity 9

Pillar

Statutory users  
science admin.

Activity 9

Pillar

Statutory users  
science admin.

Activity 9

Directors rapporteur  
rapporteur  
rapporteur

rapport. 9

Possible functions of the ELI-ERIC Governance and Management	
<b>Main function</b>	Sub-functions/Tasks (random)
<b>Support to statutory activities, and statutory Bodies, Committees Communication</b>	Secretariat of Bodies, Minutes, Agendas, Calendars, Composition of the bodies and data on Components/Delegates (nomination-expiration-renewals....). Interactions with Members (Ministries+ Representing Entities)-Observers,StrategicPartners,...Official correspondence and archives, registrations c/o UE. Operation of the central ICT system allowing continuous interaction and seat rotation etc.....Communication and Institutional image activities
<b>Users</b>	Management of users calls, and selection Panels, recording and announcing availability of instruments, managing/developing the Virtual Users Office, logistic support to users, ..... Users data management, recording publications and other results of users, Users satisfaction, Users “alumni associations”, requirements + suggestions by users. Training of new users, users meetings
<b>Scientific Programmes</b>	In-house research, development of programmes with Members and Partners, MoUs, Participating Research Teams, proposing/planning/ future techniques and projects, scientific conferences and projects, publications and data, career management of researchers , Universities/high schools.....
<b>Technical and technological activities</b>	Technological infrastructure (Buildings&Grounds), technical and technological development programmes, training and career of technicians, interaction with technical schools, energy saving+reduction of carbon footprint, recording technological developments and inventions, implementing common technical standards and procurement. Safety standards and implementation, safety and radioprotection Informatics and communication systems and updates, development of specific hardware/software, support to data policies (VUO VRME etc.....)
<b>Human Resources</b>	Planning and Recruitment, Selecting, training, motivating, mobilizing, exchanging, of staff, communication of HR policy Definition of stipends, incl. remuneration components, and careers, evaluation, support to management, Payroll services, insurances and social security (incl. additional-EU/RESAVER...)Coordination of contractual frames in countries, support to EU policy making in HR
<b>Legal and Institutional</b>	Contracts with Members, Partners, third parties, MOUs, liabilities, definition of insurances, development and implementation of framework/specific agreements, Maintenance and upgrade of internal regulations/processes and procedures, Support to contracts, procurement, human resources Legal and legislative innovation (EU/national legislation).....
<b>Administrative and Fiscal</b>	Accounts and Budgets, Purchases/procurement, controlling, Financial/economic/international accounting of income and expenditure, Support to Administrative/Financial-Fiscal Auditing Inventories and accounting of technical devaluation/amortization, application and recording of taxation/exemption aspects,
<b>Financial and Fund raising</b>	Definition and update of member’s contributions, search for new Members/Observers/Partners, search for projects and opportunities, verification of costs benefits analysis, cost containment , relationship with funding agencies, sustainability plans, measuring socioeconomic benefits.....
<b>Technology transfer and industrial liaison</b>	Transforming technological advances into IP and commercial opportunities, pre-procurement and procurement policies to enhance TT, IPR policies, access and support to industrial users.....

The access policy must ensure attraction of the best scientific users and best results in the facilities (scientific management fully empowered):

- The reference quality (of non-proprietary access) shall be set by proposals accepted solely through independent peer review (also from non Members)
- The quantity of solely peer-reviewed proposals should be large enough to be a reference for all users.
- The proprietary access shall not limit the open access.
- Access for training and testing should be considered for the Members, and ensure the effectiveness of the Hosts «site contributions» (20 to 30%).
- Access coordinated with Partner Facilities / LaserlabEU



The general ERIC legal framework is still «consolidating» and a number of issues are still open, e.g.:

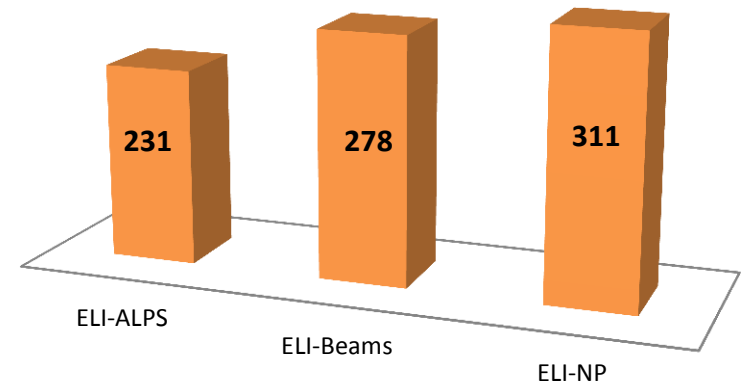
- Overlap of national and European jurisdiction in Human resources, taxation, procurements laws,.....
- The three Pillars (and maybe Partner Facilities) can be operating as «establishments» of the ERIC in the three Countries: to be elaborated in the implementation (e.g. who decides to set them up? The GA of ELI-ERIC or the Members?, what are the scope and limits?.....)
- The employment of staff must be made nationally : how to ensure mobility/training between the Pillars?
- How to best implement the potential for socioeconomic benefits in a «incomplete common market?»
- .....

# Present activities + way forward

- Defining the institutional setting:
  - Define availability, structure, international approach
  - Start the ERIC: define final points for Step 2, then about ½ year to enter into function
- Defining the financial setting:
  - Define what (level) is covered until when
  - Complete AFC process to reach clear/agreed costing
  - Define longer term requirements/expectations
- Defining and iterating the proposals to other Members
  - What we offer, what we ask, what they offer/ask.....
  - Systematic approach at highest Government level

# Some conclusions on ESIF characteristics and opportunities

- Structural funds **at national level:**  
3 separate processes and grants
- Grant beneficiaries (ELI-Hu, IoP, IFIN-HH) **individually responsible for implementation**
- ESIF: **objectives of socio-economic development** for the hosting regions (besides RI)
- Additional funding of **Technology Transfer** implemented & planned



## Lessons learned:

- a) Executive Entity should be set-up before start of construction
- b) Non Host Members commitments from the beginning
- c) Allow for one integrated project, empowering the ERIC (e.g. ownership)
  - a) Allow for synergies also across borders
  - b) Plan a start-up funding

# ELI-ERIC

Thanks for the attention!





For info or further questions on this seminar and the activities of the JASPERS Networking Platform, please contact:

JASPERS Networking and Competence Centre

[jaspersnetwork@eib.org](mailto:jaspersnetwork@eib.org)

[www.jaspersnetwork.org](http://www.jaspersnetwork.org)