



The egg, the larva and the butterfly – combining Framework Funds, Structural Funds and ERIC contributions to implement ELI

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This talk's main messages:

- **Successive use of diversified resources may require substantial project metamorphosis**
- **Metamorphosis during implementation bears both danger and opportunities**
- In nature, metamorphosis is a successful strategy.
 - => ***We must learn to master the art of metamorphosis for the development of Research Infrastructures .***

ELI's lessons learned, and lessons still ahead

ELI – The European „*Extreme Light
Infrastructure*“

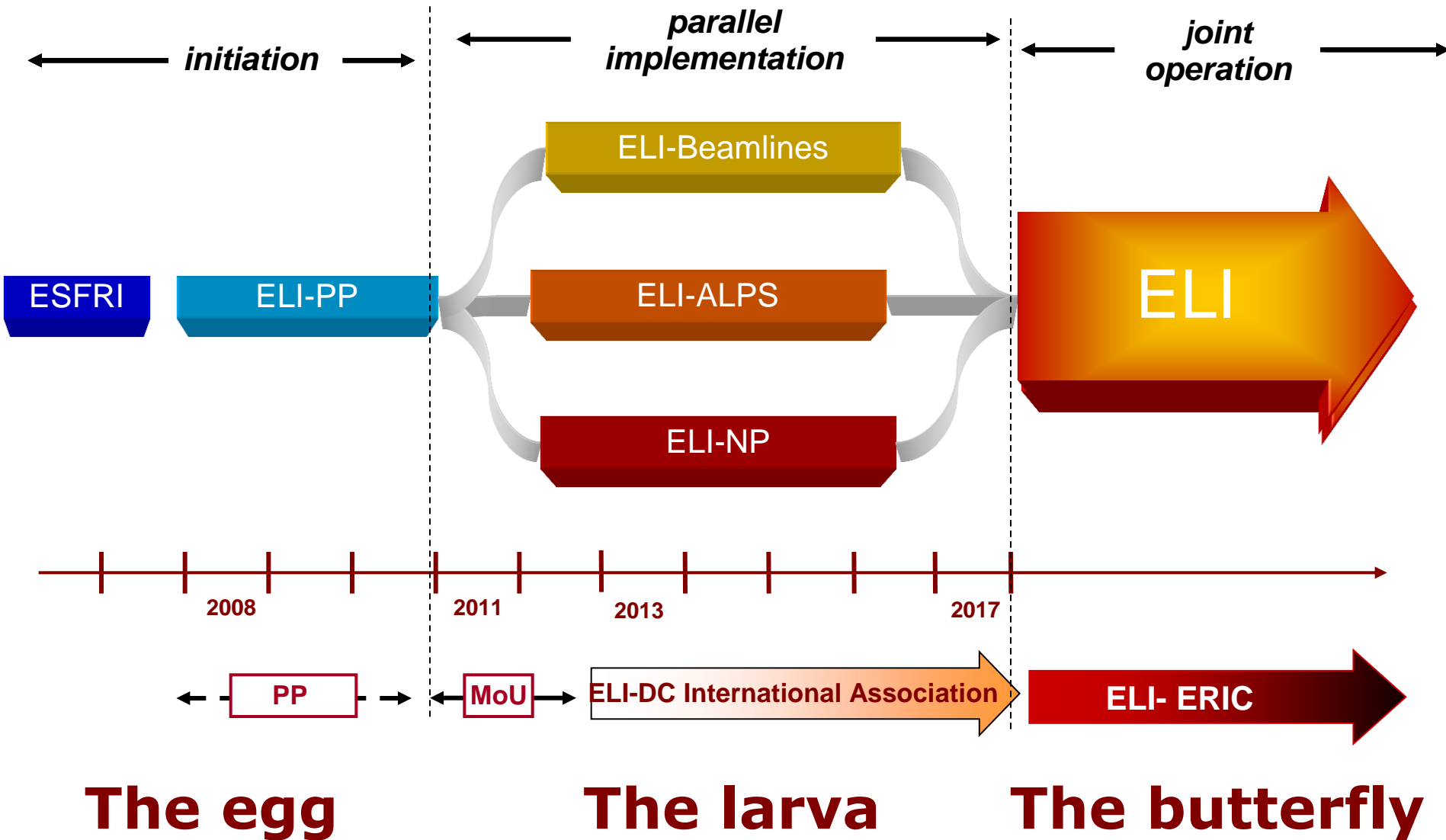
ELI's four grand challenges

ELI will be

- the world's **first international laser research infrastructure**, providing unique science and research opportunities for international users
"The CERN of laser research"
- a **distributed research infrastructure** based initially on 3 facilities in CZ, HU and RO
- the first ESFRI project to be **implemented in the new EU Member States**
- **pioneering a novel funding model** combining structural funds (ERDF) for the implementation and contributions to an ERIC for the operation



ELI's Roadmap



← *initiation* →

← *implementation* →

← *joint operation* →



Images from wikipedia

The egg

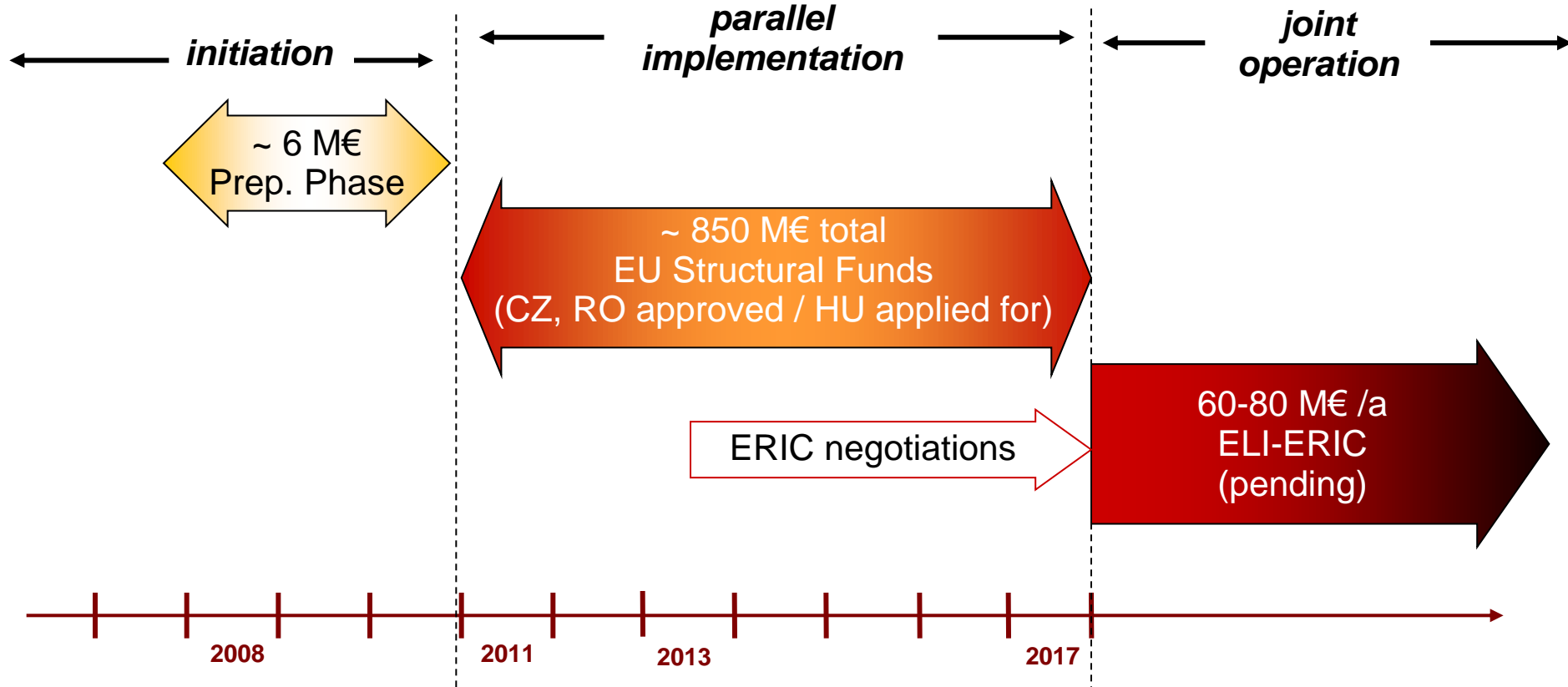
The larva

The butterfly

ESFRI - lessons learned from nature (1)

- “Many species have long larval life stages while others can remain dormant in their pupal or egg stages and thereby survive winters.”
- “Butterfly larvae, or caterpillars, spend practically all of their time in search of food”

From wikipedia



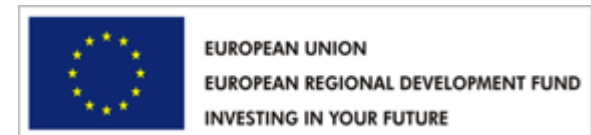


ELI will be implemented as **a distributed research infrastructure**

&

ELI is the first ESFRI project to be **fully implemented in the newer EU Member States (EU 13)**

Project supported by:



New and complementary science, unique research opportunities

Attosecond Laser Science, will capitalize on new regimes of time resolution (*ELI-ALPS*, Szeged, HU)
Construction budget ~ 220 Mio €.

• **High-Energy Beam Facility**, responsible for development and application of ultra-short pulses of high-energy particles and radiation (*ELI-Beamlines*, Prague, CZ). Construction budget ~ 280 Mio €.

• **Nuclear Physics Facility** with ultra-intense laser and brilliant gamma beams (up to 19 MeV) enabling novel photonuclear studies (*ELI-NP*, Magurele, RO)
Construction budget ~ 300 Mio €.

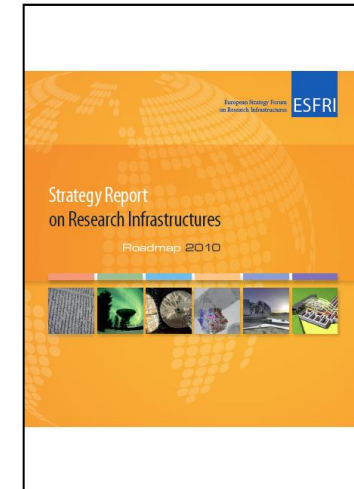
• **Ultra-High-Field Science** centred on direct physics of the unprecedented laser field strength (*ELI 4*, to be decided)



ELI is **pioneering a novel funding model combining the use of structural funds** (ERDF) for the implementation and **contributions to an ERIC** for the operation

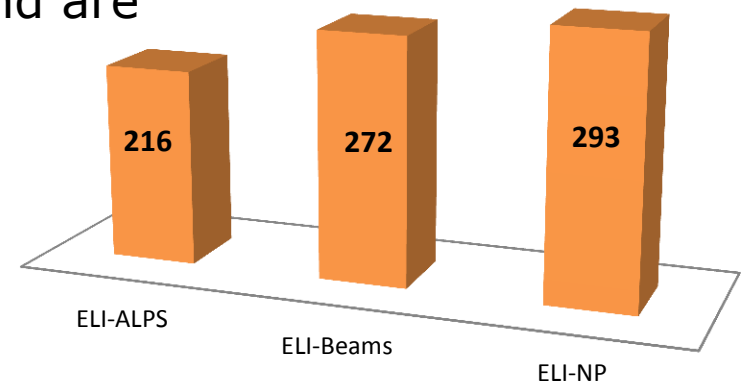
RIs – “Tools for science”

“RIs offer unique research services to users, and are a key instrument to solve grand societal challenges.”



Structural Funds and Cohesion Fund

“The Structural Funds and the Cohesion Fund are intended to narrow the development disparities among regions and Member States.”

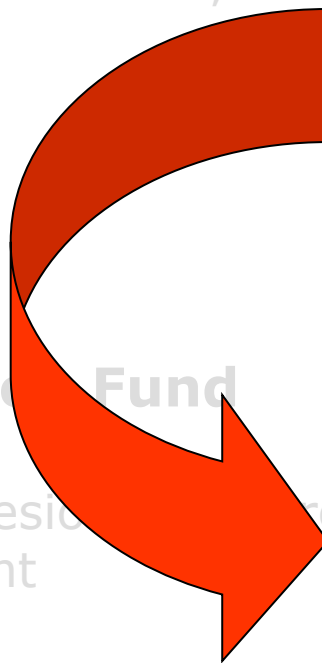


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From the egg to the larva



DG Regio on Research infrastructures

- ✓ *They must be integral part of strategies, not "cathedrals in the desert" & large-scale budget absorbers*
- ✓ *Identified in an entrepreneurial discovery process, not just desired by academia & researchers*
- ✓ *Research excellence per se is no objective for Cohesion Policy, but just a tool for competitiveness and growth*
- ✓ *Key RI should be designed / transformed into crystallisation points for economic change and growth: clusters, technology parks, incubators, firm cooperation*
- ✓ *Importance of international attractiveness & connectedness: private investors & brain-gain*
- ✓ *Evaluation, evaluation, evaluation!*

*Katja Reppel
CC smart and sustainable growth
DG Regional and Urban Policy*

- **Structural funds allocated at the national level through 3 separate processes and grant agreements**
 - ➔ - **ELI construction faster than via an ab-initio ERIC!**
 - **only a “lean ELI-ERIC” required for later operation**
- **Grant beneficiaries (ELI-Hu, IoP, IFIN-HH) individually responsible for the implementation of the 3 ELI facilities**
 - ➔ **“lean governance” model for constructing a distributed RI**
- **ERDF: additional objectives of socio-economic development for the hosting regions (besides RI objectives)**
 - ➔ - **added value for the ERA and regional development**
 - **return of investment for the host country**

1

Structural Funds Applications

- Challenges related to the content of the application
- Challenges related to the application process

2

Structural Funds management challenges

- How to deal with the strict time constraints applying to the use of Structural Funds

3

ESFRI project institutional challenge

- How to keep the pan-European character and consistency of the project?
- What approach towards ERIC? Preparing the final metamorphosis.

1

SF Application challenge



Scope and duration of the application process

- Integration into national “Operational Programs” followed by EC evaluation for major projects
- Lengthy procedure (ELI-BL: close or more than a year) for evaluation and approval by the EC
- Partial re-definition of environmental, legal, financial, organisational, and socio-economic goals and objectives

Elements of project metamorphosis

- **Cost-Benefit Analysis:** Choice of indicators, quantification and monetisation inherently subject to high level of uncertainty in the context of a RI project
- **Compliance with competition rules** in procurement procedures
- **Demonstration of financial sustainability:** need for long-term financial perspectives and assurances in hosting countries to support operation

2 Management challenge



- **Phasing** as an (incomplete) answer to the time constraints of structural funds
- **Even with phasing:** a mid-term “financial reset” is incompatible with efficient project management. There is a high risk for partial loss of EU Structural Funds !
- **Conditions for phasing:**
 - Need for two distinct and physically identifiable phases
 - Investment delivered by Phase 1 needs to be “ready for its use / purpose” (condition assessed *in concreto*)
 - “Horizontal phasing” as a more appropriate approach in the context of RIs like ELI.

3

Institutional ESFRI project challenge



- **Two layers of responsibilities and interests**
 - **Pan-European dimension** and character of the project
VS.
 - **Legal responsibility and autonomy of the sites** in the scientific implementation + socio-economic regional development
- **Political and administrative constraints:**
 - Typically no synchronisation of operational programmes (OP) in the three countries
 - Time needed to secure national political support may conflict with SF time frames
 - Different administrative arrangements (OP under responsibility of Research Ministry or development agency)

The biggest remaining challenge:

“Selling” the project to an international ERIC Consortium for sponsoring and operating ELI-ERIC after the implementation phase (after 2017)

From the larva to the butterfly – the final metamorphosis

ESFRI - lessons learned from nature (2)

- Between the larva and the butterfly there is yet another stadium, the pupa or cocoon.
- It is sometimes used by people to kill the insect and recover some resources
- Only bad people would do that to ELI. Still, to be safe, ELI plans to dismisses this stadium.

eli

delivery consortium

The ELI-ERIC



Objective:

Unified and joint operation of the ELI facilities

- Financially sustainable operation based on contributions from ERIC members
- One legal entity governing the operation of all three research centres => finding a new balance between national and international responsibilities
- Common policies for operation, access, data management, dissemination, quality control etc
- Operation as a single user facility, open for international access with world-class research opportunities, highest scientific standards and high-quality scientific output

- **Risk of a loss of larger international commitment** during implementation (the project is proceeding from EU resources)
- **Need for coordination** between implementation teams to prepare joint and high-quality operation and ensure overall scientific coherence
- **Preparation of ERIC negotiations** in parallel with implementation: both a challenge and an opportunity!
- **Staged approach to ERIC**: at some point a clear transition of responsibilities and governance from national authorities towards ERIC has to take place (“disruptive transition”).

Largely uncharted legal territory !

Summary of lessons learned

Structural Funds are, in principle, an excellent funding model for the swift construction of ESFRI RIs, for strengthening the ERA and for fostering synergies between the socio-economic and scientific objectives.

However:

High-risk projects such as world-class research infrastructures are a new and different class of Structural Funds "clients" and require substantial (!) adaptation of procedures and cultures - both on the EC and national levels.

Most importantly, the use of Structural Funds may cause a **back-reaction on the project itself**, posing new opportunities but also considerable challenges if not built in from the beginning

The strong national and components and national legal commitments imposed by Structural Funds are not easily matched to the pan-European character of ESFRI RIs, **especially in the case of distributed RIs like ELI.**

Hence, **concepts for the transition** between the SF construction phase, and the ERIC operation phase, need to be developed early on.

The path to the final metamorphosis, from Structural Funds towards ERIC, is still largely uncharted territory.

ESFRI - lessons learned from nature (3)

- “Omnia mutantur, nihil interit (everything changes, nothing perishes).”

Ovid, Metamorphoses

- “In this light, metamorphosis can be seen as a division of the labor of perpetuating the species, since the larval form basically does nothing but eat, while the adult form has sex and reproduces.”

(From: answers.yahoo.com).