

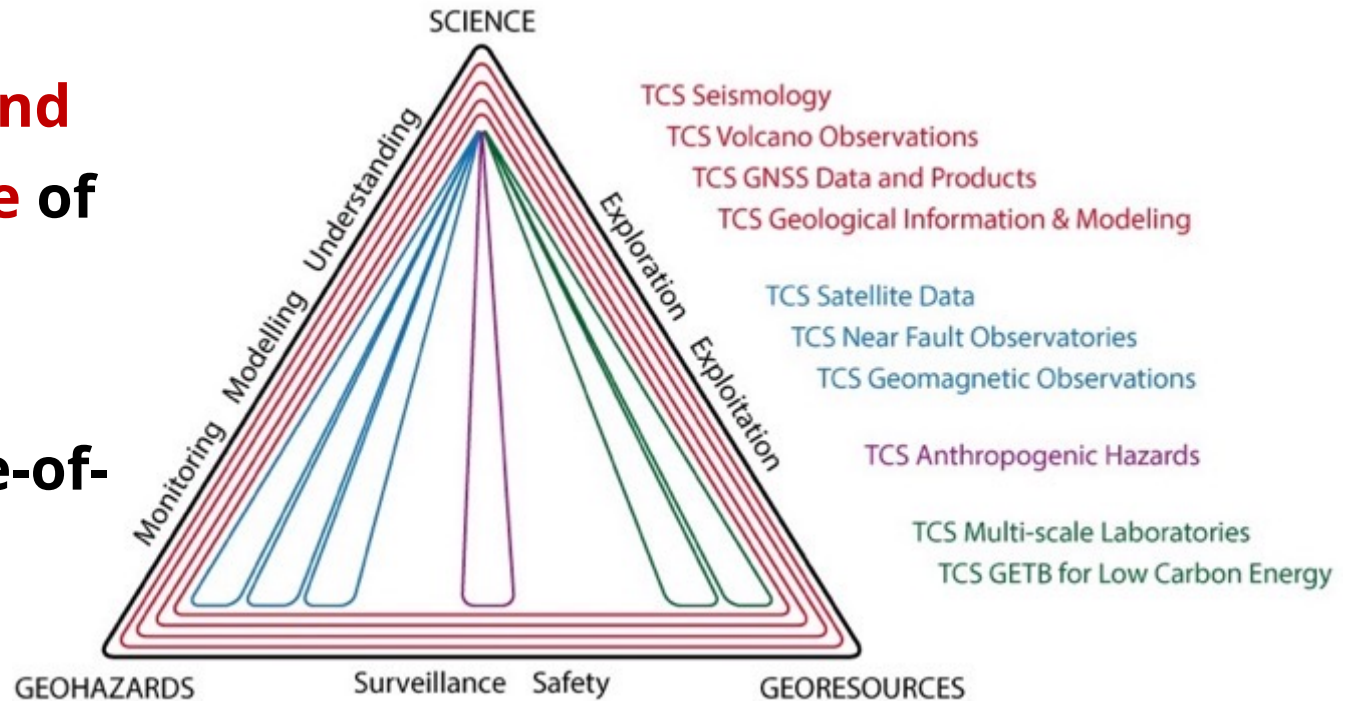


# EPOS Long Term Sustainability

**Massimo Cocco**

**Executive Coordination Office**

To ensure **sustainable and universal use and re-use** of multidisciplinary solid Earth science data and products fostering state-of-the-art research and innovation

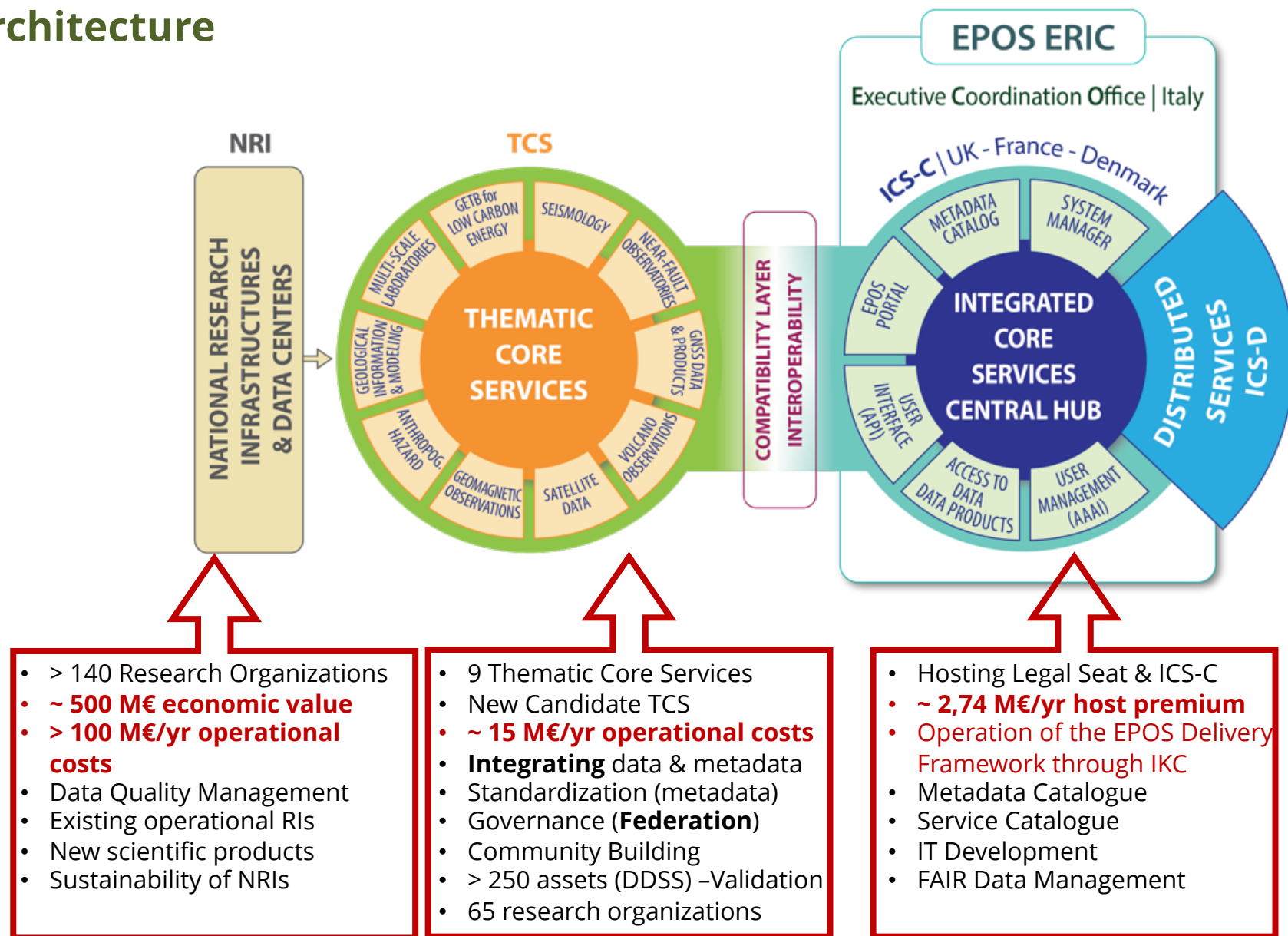


To make possible a **better understanding** of the Earth surface and sub-surface dynamics and use this progress in science for the assessment of geo-hazards and sustainable use and exploitation of geo-resources

To establish a **sustainable and long-term access** to solid Earth science data and services integrating diverse European Research Infrastructures under a **common federated framework**



# EPOS ERIC Architecture





## The transition from the Implementation Phase to the Operational Phase requires simultaneous construction, implementation & operation

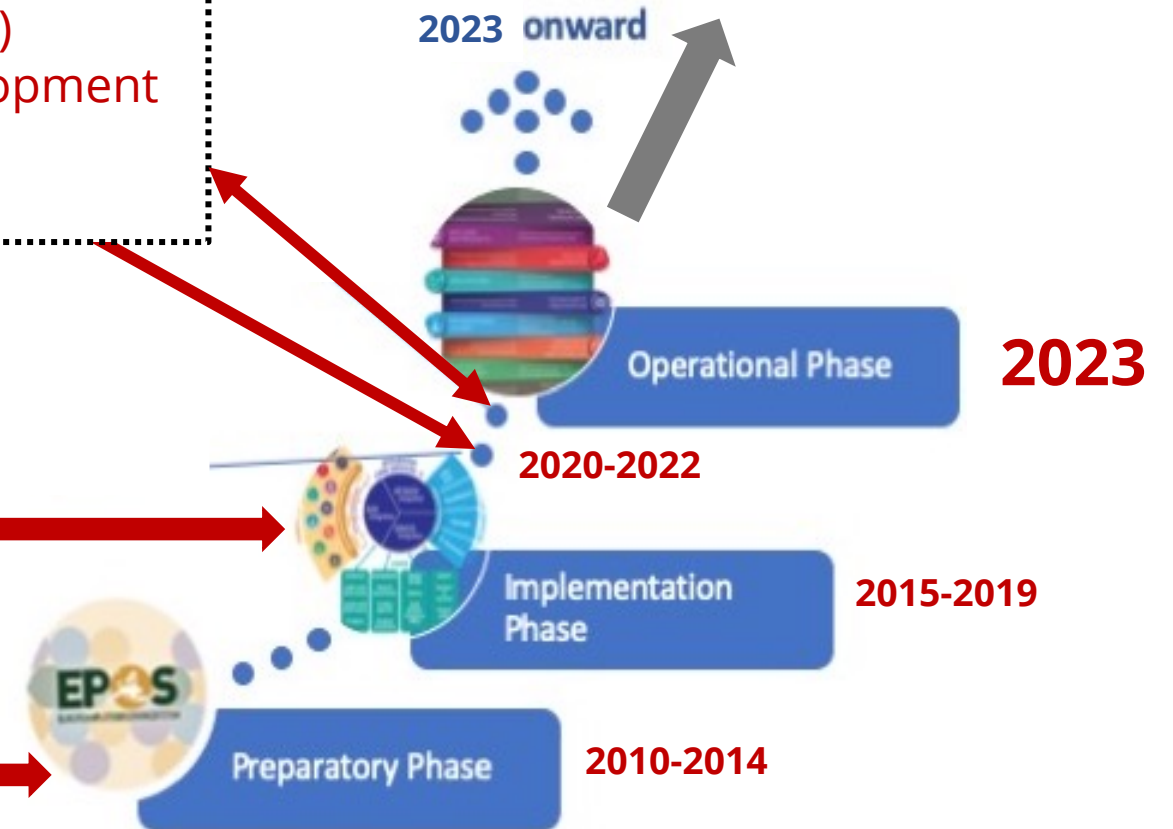
### Pilot Operational Phase (POP)

- EPOS ERIC Governance & Operation
- 2020-2022 Strategic Plan (construction)
- ICS-C hosting and operation – IT development
- TCS implementation & construction
- Pilot Operational Testing for operation

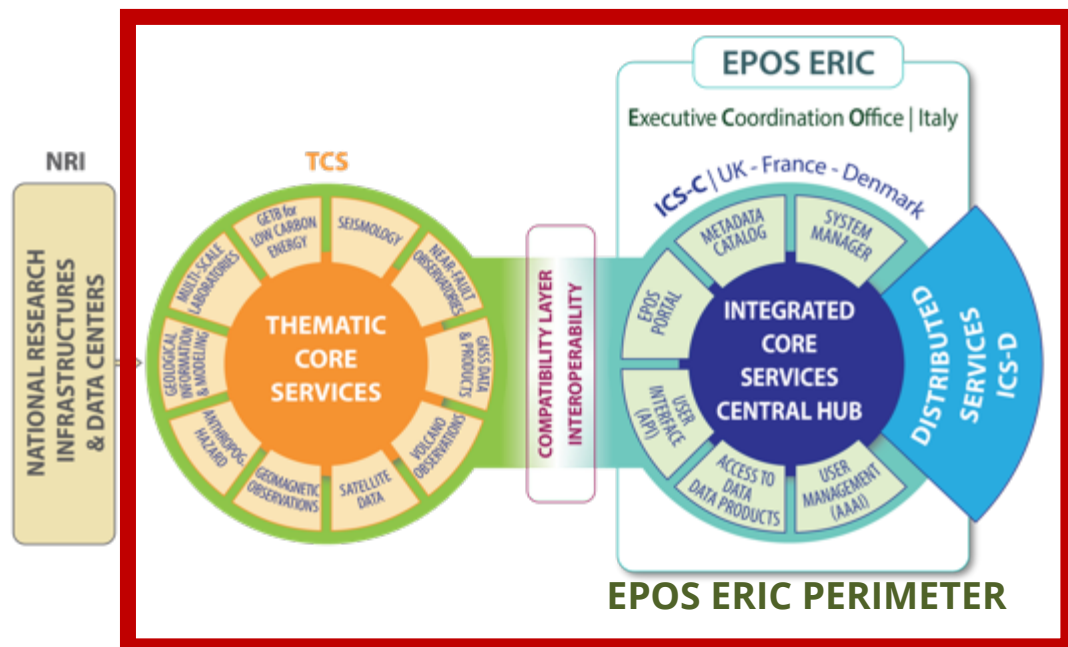
- Vision and Mission confirmed
- Implementation of functional architecture
- Thematic & Integrated Core Services TCS - ICS
- ERIC established – EPOS ERIC construction

- Vision and Mission shared with communities
- Design of the functional architecture
- Thematic Working Groups
- ERIC perspective and choice

- ERIC Governance
- TCS-ICS system robustness
- Financial Viability
- User strategy
- FAIR data management



# EPOS Delivery Framework



- Robust Governace
- Effective Legal Framework
- Financial Viability
- Technical Robustness
- Trust & Credibility

## EPOS Federated Approach

FEDERATED means:

- TCS communities
  - ❖ 9 TCS Governance & Coordination
  - ❖ 1 Candidate TCS
  - ❖ 1 new community (from SERA)
  - ❖ 35 Service Providers
  - ❖ Data & Service provision: 200 DDSS, 236 web-services
  - ❖ TNA Coordination & Provision
- TCS-ICS system
  - ✓ ICS-C Data Interoperability
  - ✓ Shared IT developments
  - ✓ Procurement ICS-D
- 14 Research Organizations (65 in TCS)
- 5+1 International Organizations



# EPOS POP 2020-2022 Strategic Plan

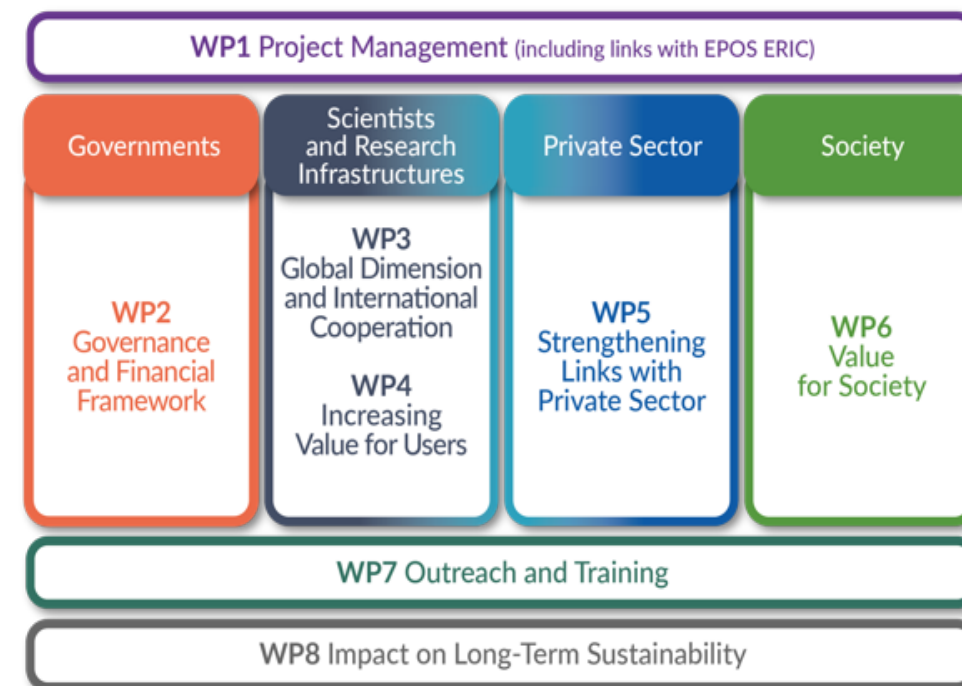


## Building the EPOS Delivery Framework

1. finalizing the ICS-C hosting COMPLETED
2. establishing the TCS Governance and Coordination COMPLETED
- ✓ 3. enabling the TCS data and service provision
4. implementing and establishing TNA coordination and provision
5. fostering the IT development of the TCS-ICS delivery system COMPLETED
- ✓ 6. Supporting Sponsored Research Activities

## Sustainable EPOS Delivery Framework

### EPOS SP Project



# EPOS Approach to Long-Term Sustainability

- **Scientific Excellence**

- ❖ Scientific perspectives
- ❖ Scientific Impact
- ❖ Science for society
- ❖ Innovation

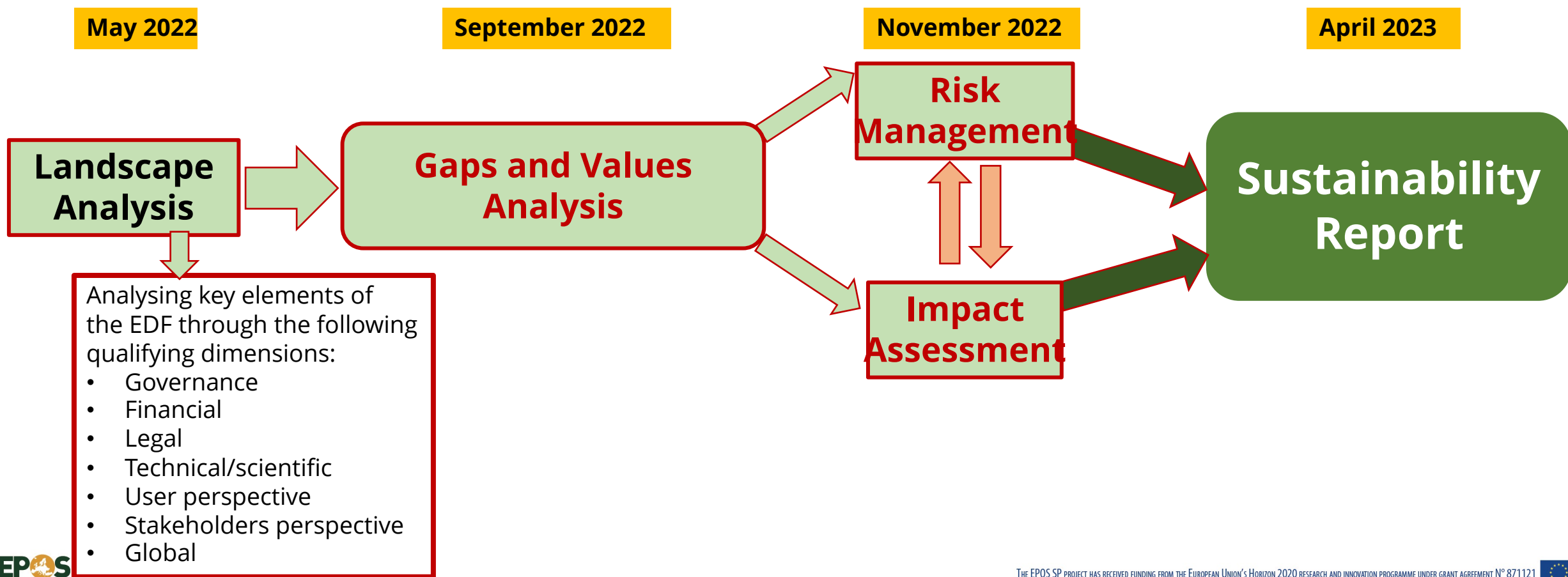
- **Sustainable operation**

- ❖ RI key elements:
  - ✓ ECO
  - ✓ ICS-C
  - ✓ TCS
- ❖ Technical readiness for operation (POT outcomes)
- ❖ Effective Governance
- ❖ Financial Viability



# EPOS Roadmap to Long-Term Sustainability

- EPOS SP mail deliverable: Long-Term Sustainability Report
- From construction to sustainable operation of the RI addressing Long-Term Sustainability



# Landscape Analysis Background

EPOS Landscape can be seen as a synthesis of **organizational elements** and founding **structures** of various nature (collaborative environments, data suppliers, service providers, technological infrastructures) **characterizing** the **EPOS Delivery Framework** and the **RI architecture**.

The Landscape Analysis (LA) is aimed at presenting to well identified target stakeholders (LA's users) the **organization and functioning** of the EPOS RI **as a continuity of architectural/organizational elements interconnected to ensure RI sustainable operation**, requiring human resources, skills, technologies and coordination.

To understand and manage the complexity of the EPOS RI and the evolutionary mechanisms of its architecture and organizational structure an **analytical and in-depth study is necessary**.

The overarching goal is to increase **knowledge** and **awareness** on EPOS workings

# Landscape Analysis: Scientific Perspectives

**Providing access to solid Earth science data, data products, software, and services (DDSS) to enable scientific research and serendipity by the:**

- integration of data and products already available independently of EPOS;
- access and integration of data and products not available without EPOS;
- provision of new data and scientific products implemented by TCS.

**Fostering multidisciplinary use of solid Earth science data and products (DDSS) by the integrated use of multidisciplinary products supporting scientific research in solid Earth science;**

- exploitation of new services for data visualization and analysis.

**Enabling cross-disciplinary use of solid Earth science data and products for Earth science through:**

- collaborations with environmental RIs;
- contributions to the Earth Observation System.

**Contributing to progress in hazard assessment and risk mitigation for both:**

- natural hazards;
- anthropogenic hazards.

**Strengthening Computational Earth Science making available:**

- new data products from High Performance Computing applications;
- fast High Performance Computing applications for hazard scenarios;
- contributions to Digital Twins and Digital Earth.

# Landscape Analysis: Scientific Perspectives

## SCIENTIFIC PERSPECTIVES

### **Contributing to IT Innovation and FAIR Data Management fostering:**

- scientific progress from effective FAIR data management from sparse and small data providers (laboratories, small observatories, project outcomes);
- facilitating FAIR data management for collaborative research.

### **Fostering upstream developments of services for society to be used by community operators through downstream applications with particular focus on:**

- progress in forecasting and predictability;
- services for Early Warning and Alert.

### **Strengthening international collaborations and global dimension of research in solid Earth science through:**

- participation to international initiatives (GEO, GEM, NEAMT);
- new frameworks for Trans-National Access.

### **Promoting training and dissemination on Solid Earth Science.**



# Key elements - Structural Elements for the Operation

## • EPOS ERIC Perimeter

- ECO
- ICS-C
  - ❖ ICS-C Office
    - ICS-C Hosting and Operation
- Decision, Support, Advise
  - ❖ General Assembly
  - ❖ Executive Committee
  - ❖ Service Coordination Committee
  - ❖ External Advisory Boards

## • EDF Perimeter

- TCS
  - ❖ TCS Consortium
  - ❖ Service Providers
  - ❖ Data Providers
  - ❖ TCS Operation
- ICS-D
- Development
  - ❖ TCS-ICS Interactions
  - ❖ ICS-C Development
  - ❖ TCS Development
  - ❖ IT Board

## • External to perimeters

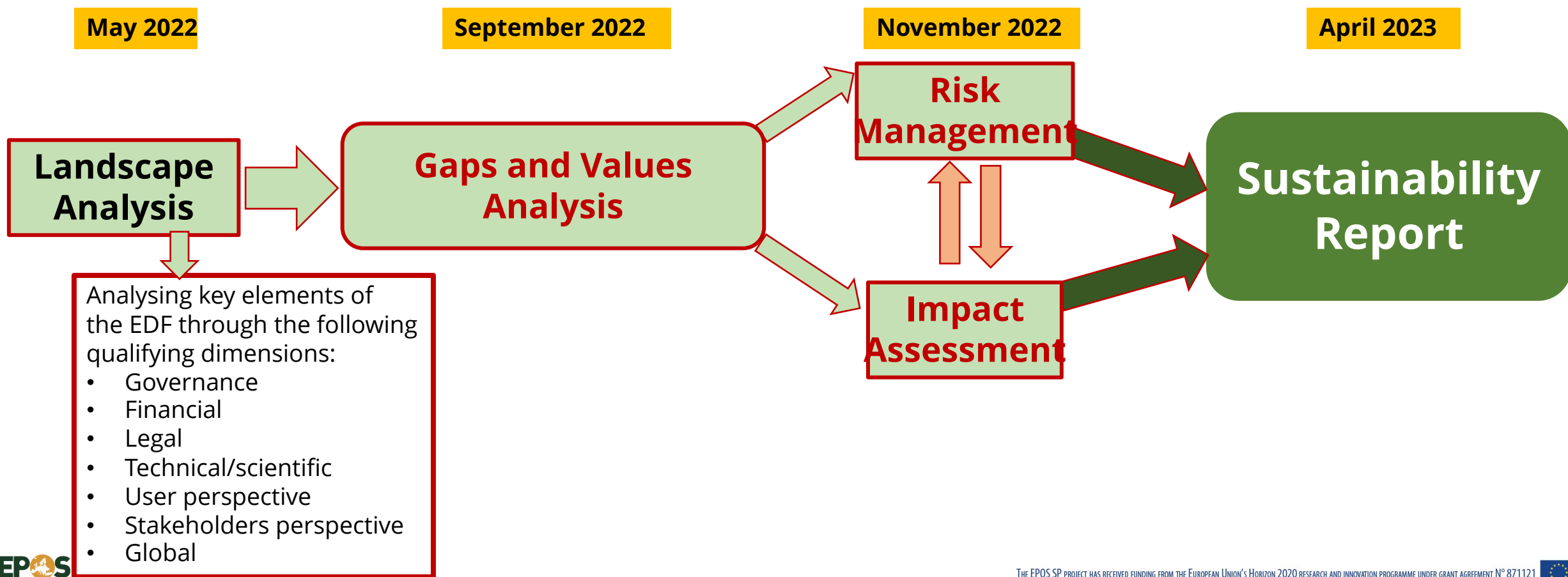
- NRIs
- Cooperative Framework

### Qualifying Dimensions

- Governance
- Financial
- Legal
- Technical
- Users
- Stakeholders
- Global

# EPOS Roadmap to Long-Term Sustainability

- EPOS SP mail deliverable: Long-Term Sustainability Report
- From construction to sustainable operation of the RI addressing Long-Term Sustainability



## 4. EPOS ERIC key documents on sustainability

### EPOS-SP

#### Long-term Sustainability report (LTS)

Project deliverable including including LA, gaps/added values, risks, impact. Distribution at project level.

**Due: Nov. 2022 (draft) & Apr. 2023 (final)**

### EPOS ERIC

#### Sustainability scenarios

Support document with scenarios derived from the draft EPOS-SP LTS report, to be shared with GA for discussion during GA meeting of December 2022.

**Due: Nov. 2022**

#### Science Program (2023-2027)

EPOS ERIC strategic document, with the scientific objectives of the EPOS RI for 2023-2027. Shared with GA.

**Due: Dec. 2022 (draft), Apr. 2023 (final)**

#### Sustainability plan (2023-2027)

EPOS ERIC strategic and operational document, that includes the non-scientific objectives of the concerned period; and business implementation plan with the selected sustainability scenario to be pursued after discussion with GA.

**Due: Apr. 2023**

# Questionnaire structure

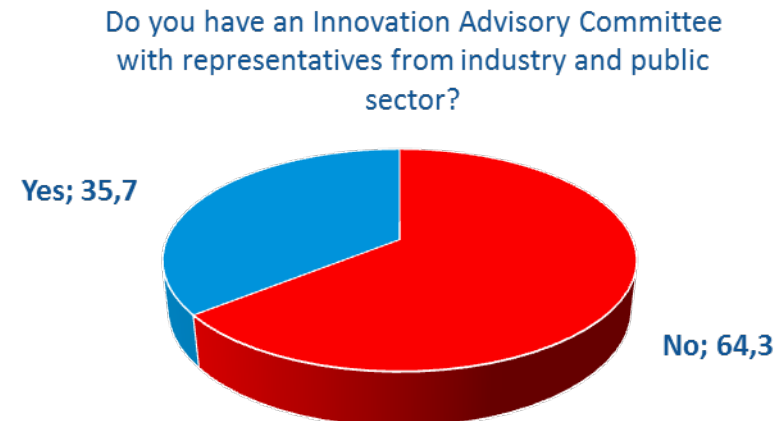
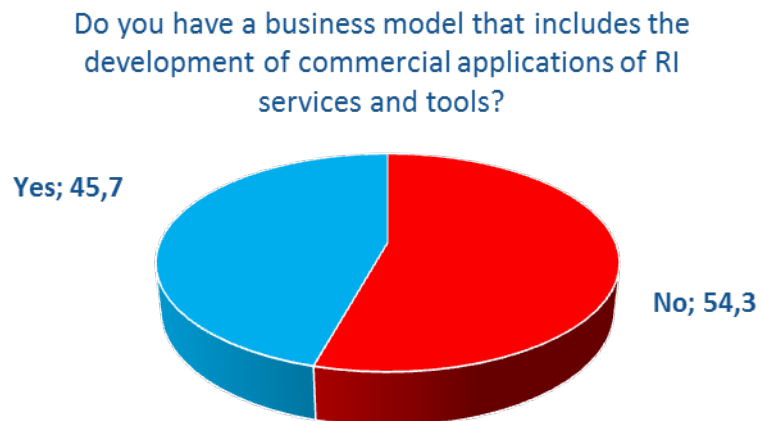
## *Long Term Sustainability Preconditions:*

- ➡ A. Ensuring Scientific excellence
- B. Skills of managers, operators and users
- ➡ C. Unlocking the Innovation potential of RI
- ➡ D. Measuring socio-economic impact of RI
- ➡ E. Exploiting better the data generated by the RI
- F. RI Life cycle – Upgrading of RI
- G. RI Life cycle – Decommissioning of RI
- ➡ H. Ensuring sustainable governance of RI
- ➡ I. Funding the construction and operation of RI
- ➡ J. Structuring the international dimension of RI



# Unlocking the innovation potential of RI

- **54% do not have a business model** that includes the development of commercial applications of RI services and tools
- **64% do not have an Innovation Advisory Committee** with representatives from industry and public sector



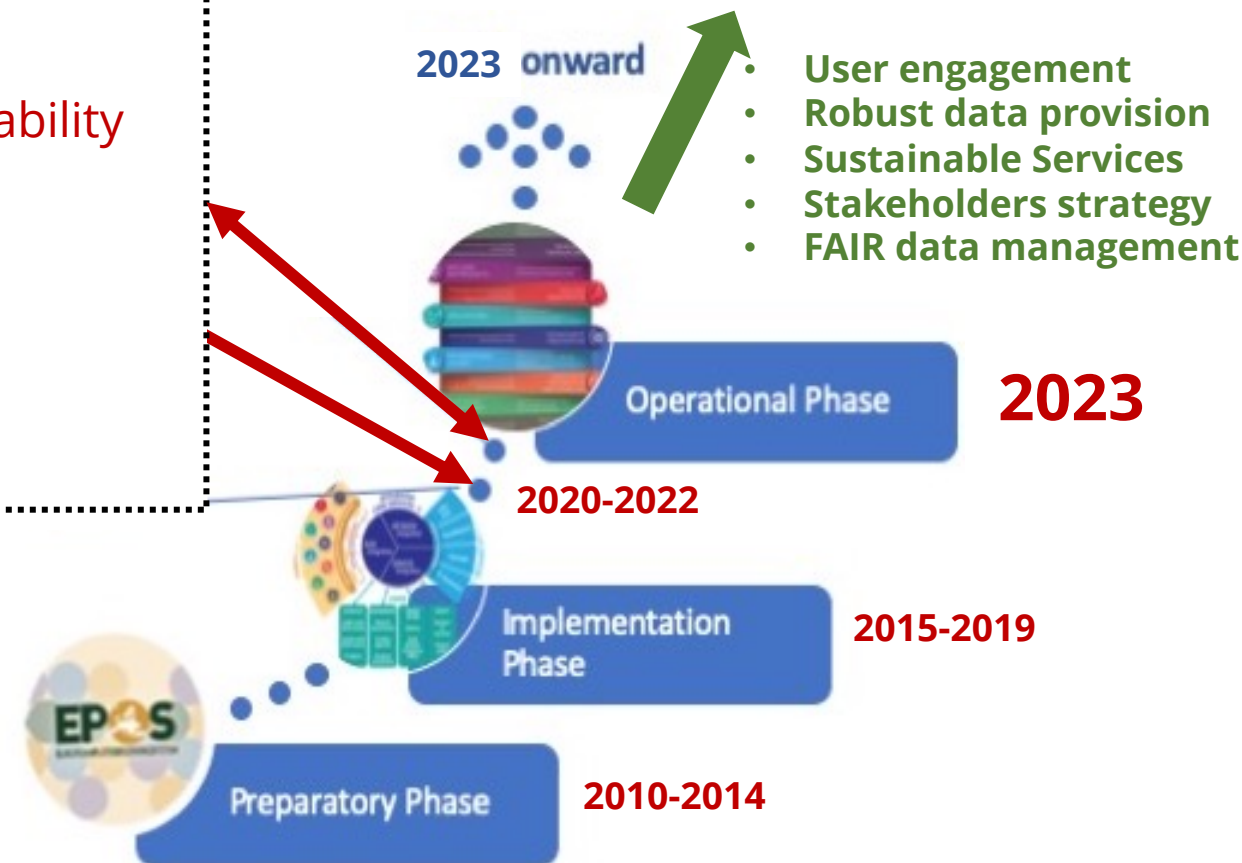
# Entering in the Operational Phase

**We need a strategy to manage the progressive entrance of data and serviced into the operational phase**

## **Pilot Operational Phase (POP)**

- Concluding EPOS POP
- Outcome of Pilot Operational Testing:
  - ✓ Readiness of services & interoperability
  - ✓ Access to data, products (DDSS)
  - ✓ Use of aggregated data sets
  - ✓ Multidisciplinary use
  - ✓ Cross-disciplinary use
  - ✓ Inferences for user strategy

- Science Program
- Sustainability Plan



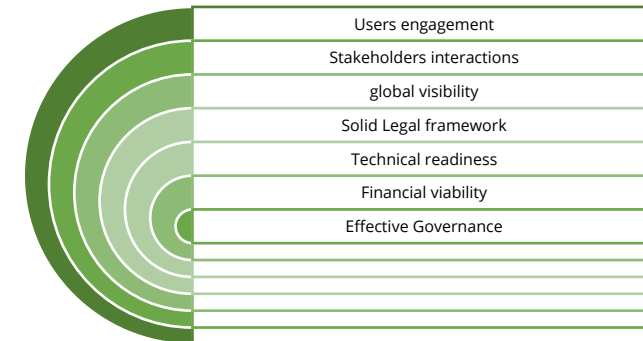
## Website



## Newsletter



## Social Media



*Thank You*

# Pre-conditions

(ranking scale 1-10: averages)

