eENVplus - eEnvironmental services for advanced applications within INSPIRE (eENVplus Training Framework)

ICT- CIP – Pilot Action

Grant agreement no: 325232

Starting date: 01 January 2013

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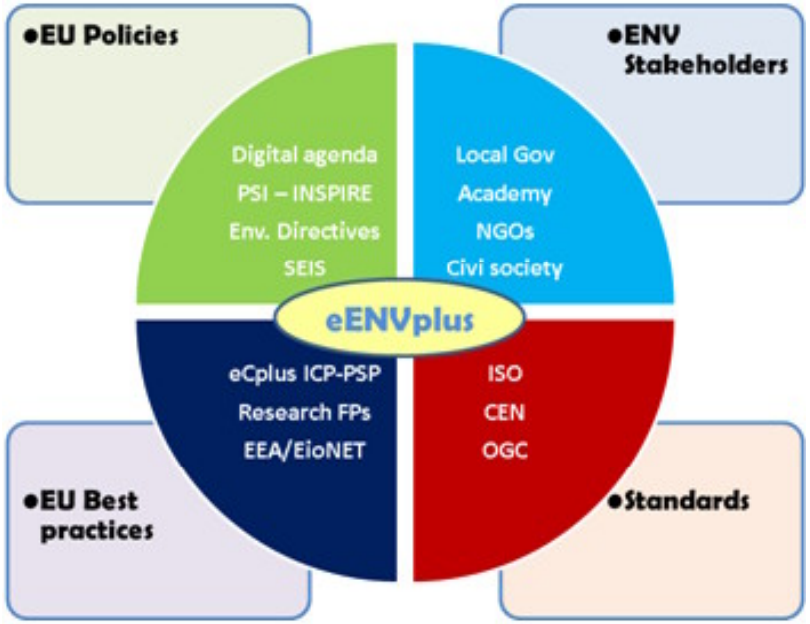
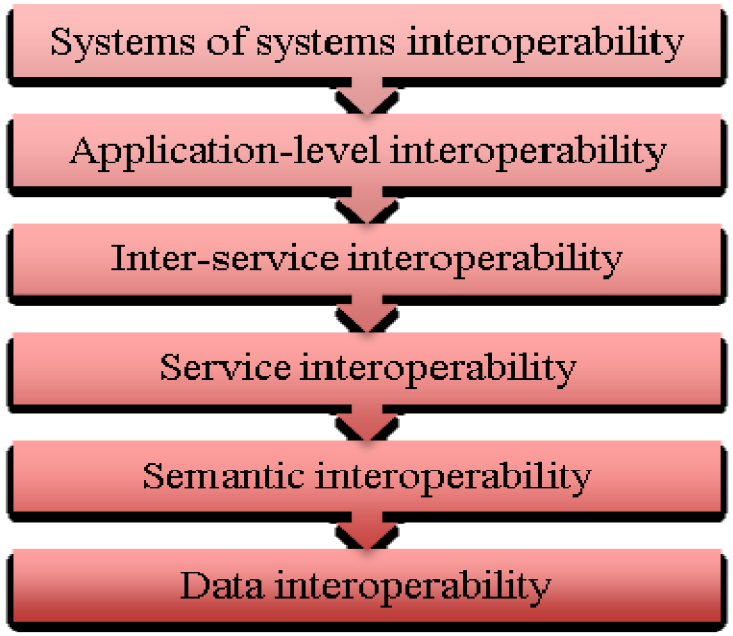
GISIG Coordinator

GeoCapacity @ Geospatial World Forum - 5 May 2014, Geneve (CH)

Key objective

- to support INSPIRE and SEIS implementation
- through deployment and integration of value-added eEnvironment services
- available at national level and through past/on-going key EC-funded project
- eENVplus provides Members State and the GI Communities, with tools addressing a **multi-level interoperability stack**:



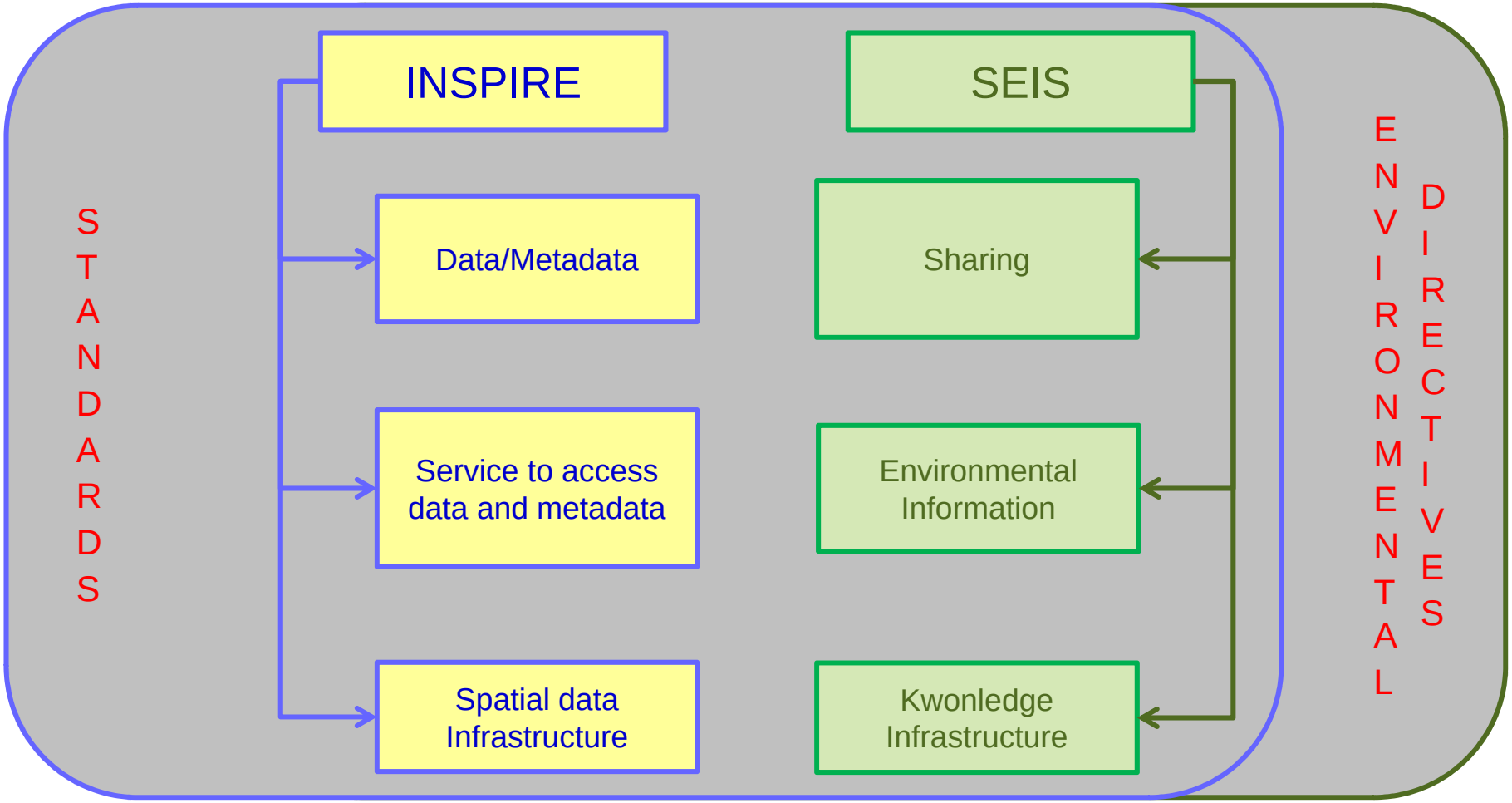


Partnership

- **National Agencies:**
  - Environmental Agencies: VMM (BE), ISPRA (IT), CENIA (CZ), SAZP (SK), MRD (HU) with support of GEO (HU); moreover, EPSILON in close cooperation with GR EA
  - Mapping Agencies: DGT (PT), NLSI (IC, in close cooperation with IC EA)
  - Thematic Agencies: Geological (GeoZS, SLO), Nature (ATEN, FR)
- **Technical partners:** CNR-IMATI, Epsilon, Sinergis, Graphitech, disy, EPSIT, PKH
- **University:** GEO
- **Standardization Body:** GISt (Secretary of CEN TC/287 Geographical Information)
- **European Association:** GISIG (eENVplus Coordinator)

19 partners from 12 countries

Contribution to the EU policy



Scenarios – Pilots - Use Cases

- Scenarios (9): the different application domains addressed by the projects
- 10 pilots (3 cross-border): the actual implementation of the scenarios in a geographical area
- Use Cases (26): a methodology used in system analysis to identify, clarify, and organize system and user requirements

[redacted]

issues) or regional example (integration among cross-border cases)

eENVplus

SEIS for air quality data.

Natural Areas INSPIRE Compliance Toolbox.

INSPIRE Geoportal.

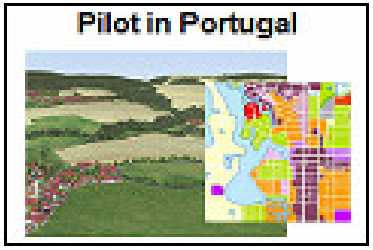
Utility services, the case of sewage networks in Flanders.

Forest Fire Management.

Geological Map Harmonization in Italy and Slovenia.

Csspire (Everyday life issues connected to Environmental aspects).

Window on the Protected Areas- Mobile Conservation Map.



Urban Landuse Planning.

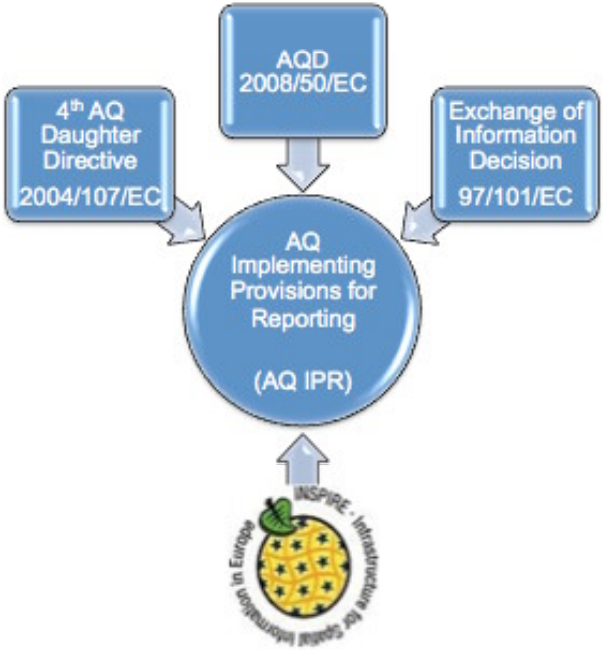
Underlying content, INSPIRE data Themes

- Various National datasets related to many INSPRE Annex I-II-III Data Themes, are considered for eENVplus (some are under IPR, many are Open Data)

Pilot Applications:	EP01	EP02	EP03	EP04	EP05	EP06	EP07	EP08	EP09	EP10
ANNEX I										
1. RS: Coordinate reference systems								■		
4. AU: Administrative units								■		■
6. CP: Cadastral parcels				■						
8. HY: Hydrography			■	■			■			
9. PS: Protected sites				■	■		■	■		
ANNEX II										
2. LC: Land cover				■		■				■
3. OI: Orthoimagery										■
4. GE: Geology									■	
ANNEX III										
1. SU: Statistical units										■
4. LU: Land use				■						■
5. HH: Human health and safety				■						
6. US: Utility and governmental services			■	■						
7. EF: Environmental monitoring facilities	■	■				■			■	
8. PF: Production and industrial facilities				■						
11. AM: Area mng/rest/reg zones & rep. units	■	■							■	
12. NZ: Natural risk zones									■	
13. AC: Atmospheric conditions	■			■						
14. MF: Meteorological geographical features						■				
17. BR: Bio-geographical regions				■	■					
18. HB: Habitats and biotopes				■	■					
19. SD: Species distribution				■	■					

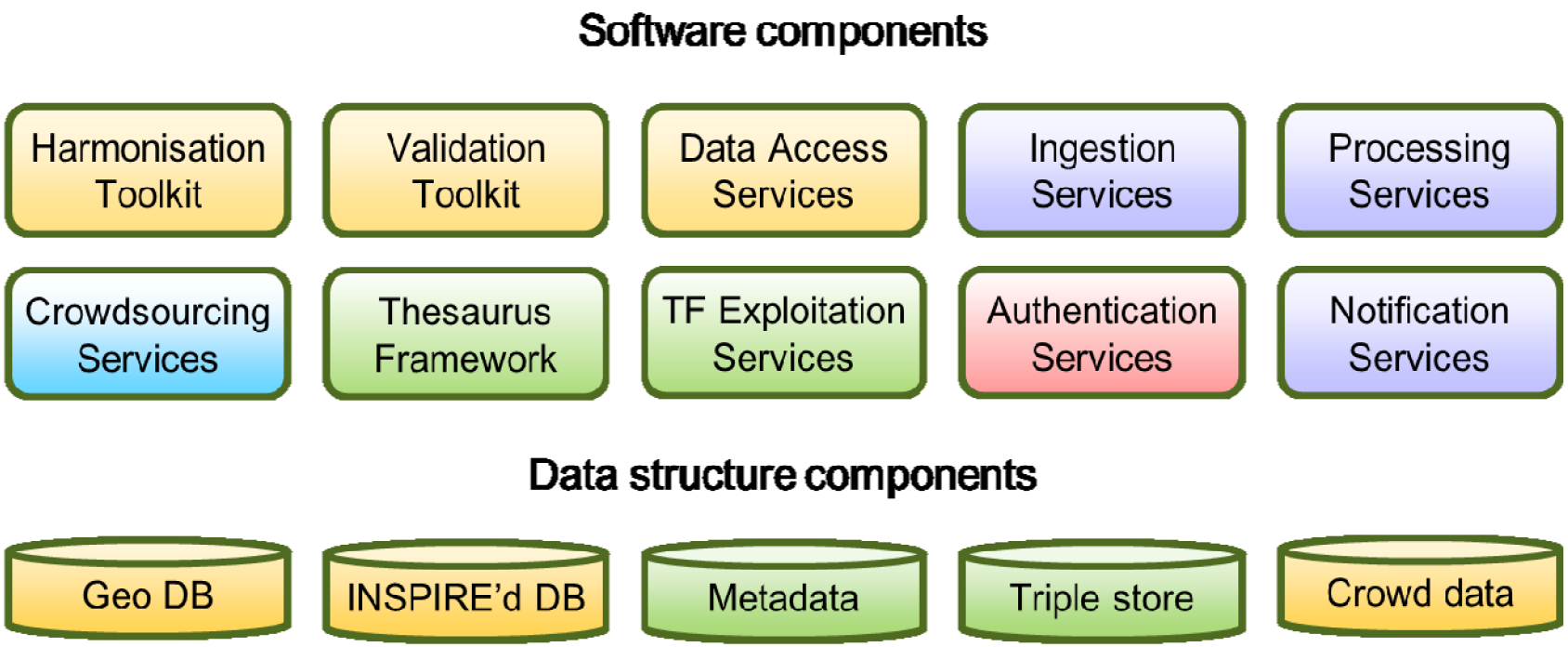
Metadata / data harmonisation

- implementing the environmental monitoring and reporting processes by the integration and adaptation of the existing EU directives (INSPIRE, ISA, eGov) and their implementing rules and guidelines, driving the process by the requirements and the constraints coming from the **operational application** of the directives in regional, national and European context.

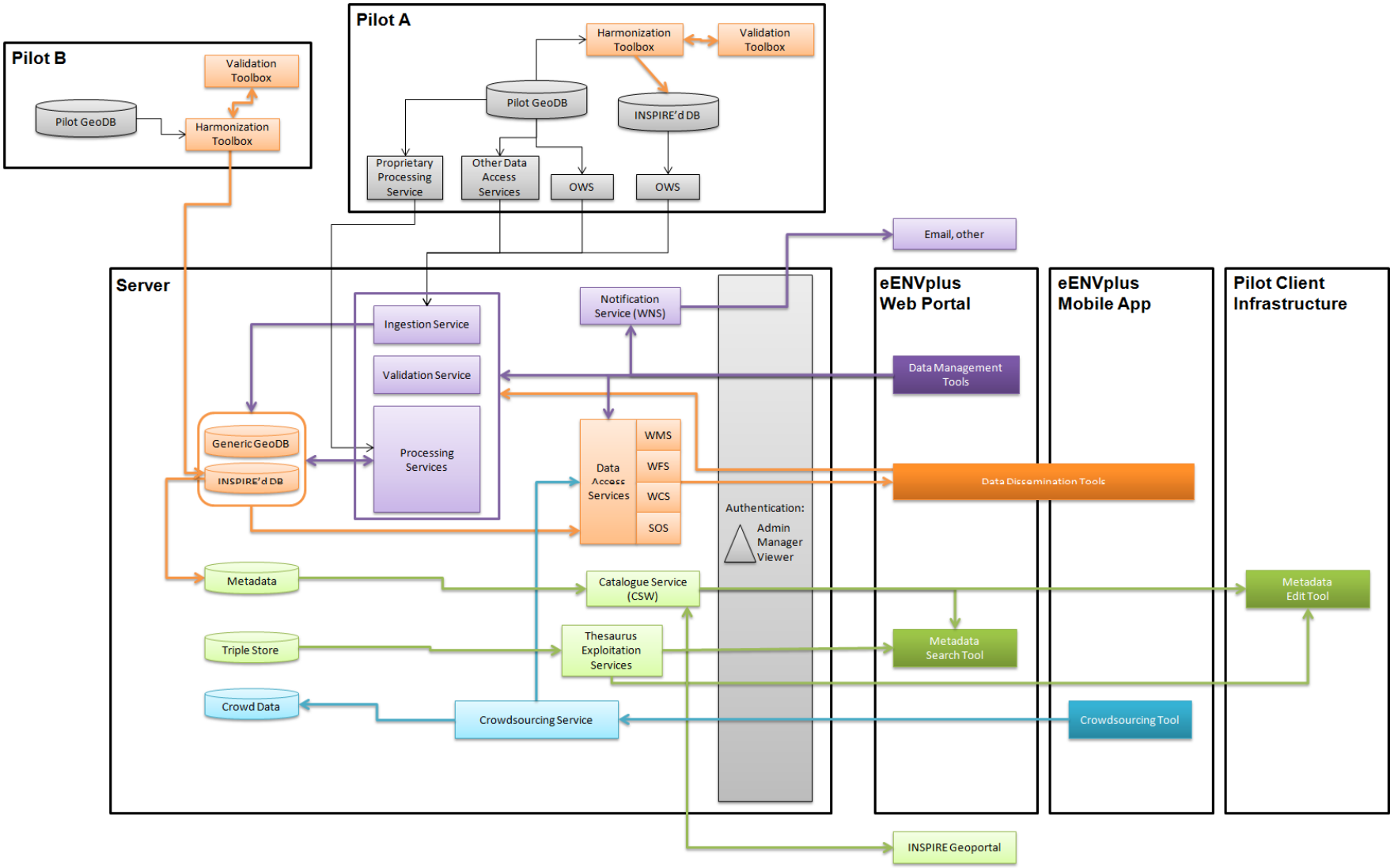


Technological solution

- eENVplus infrastructure is composed by a set of components combined into the nodes of the infrastructure

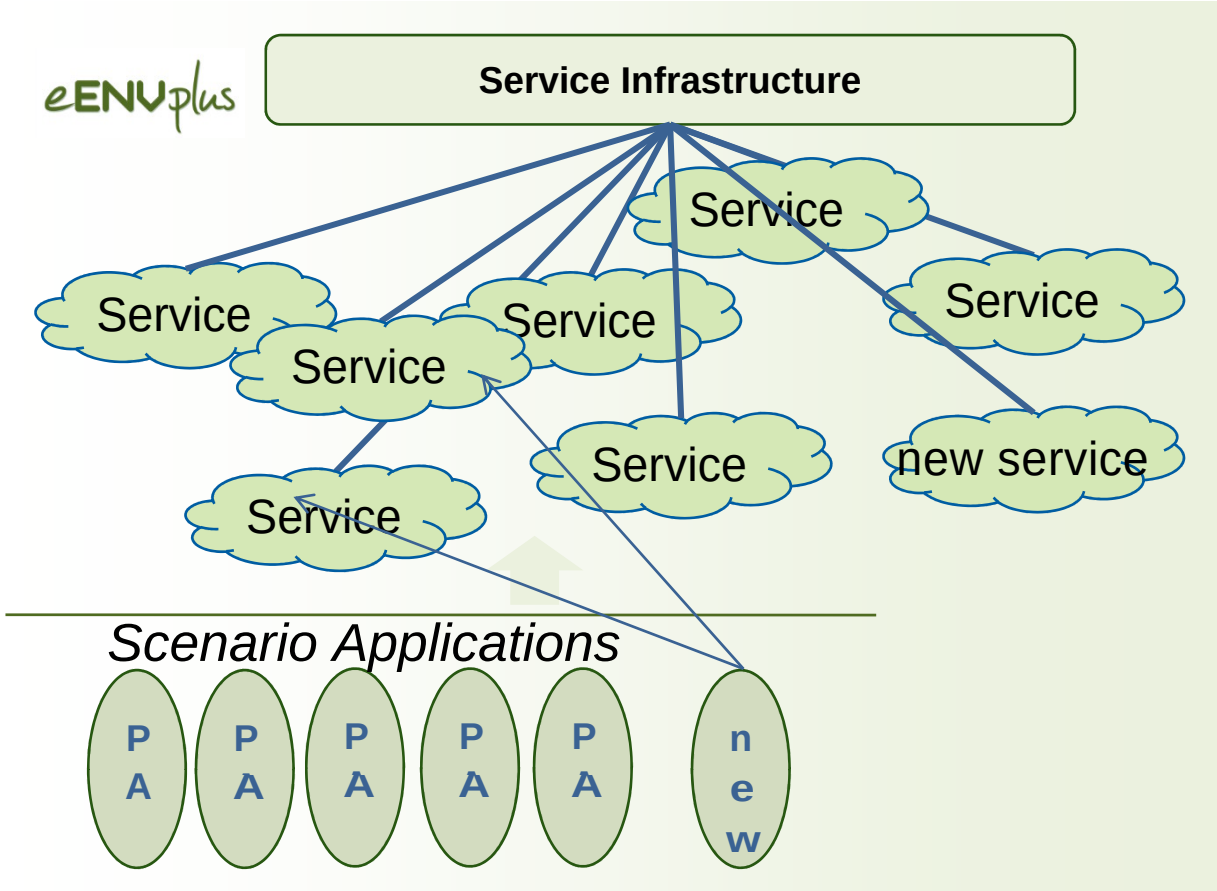


eENVplus Architecture



Sustainable perspective

- eENVplus Infrastructure is the base for including new applications and new services also within future projects at a European and National level



- eENVplus will be then the Framework for implementing/use/sharing eEnvironmental services

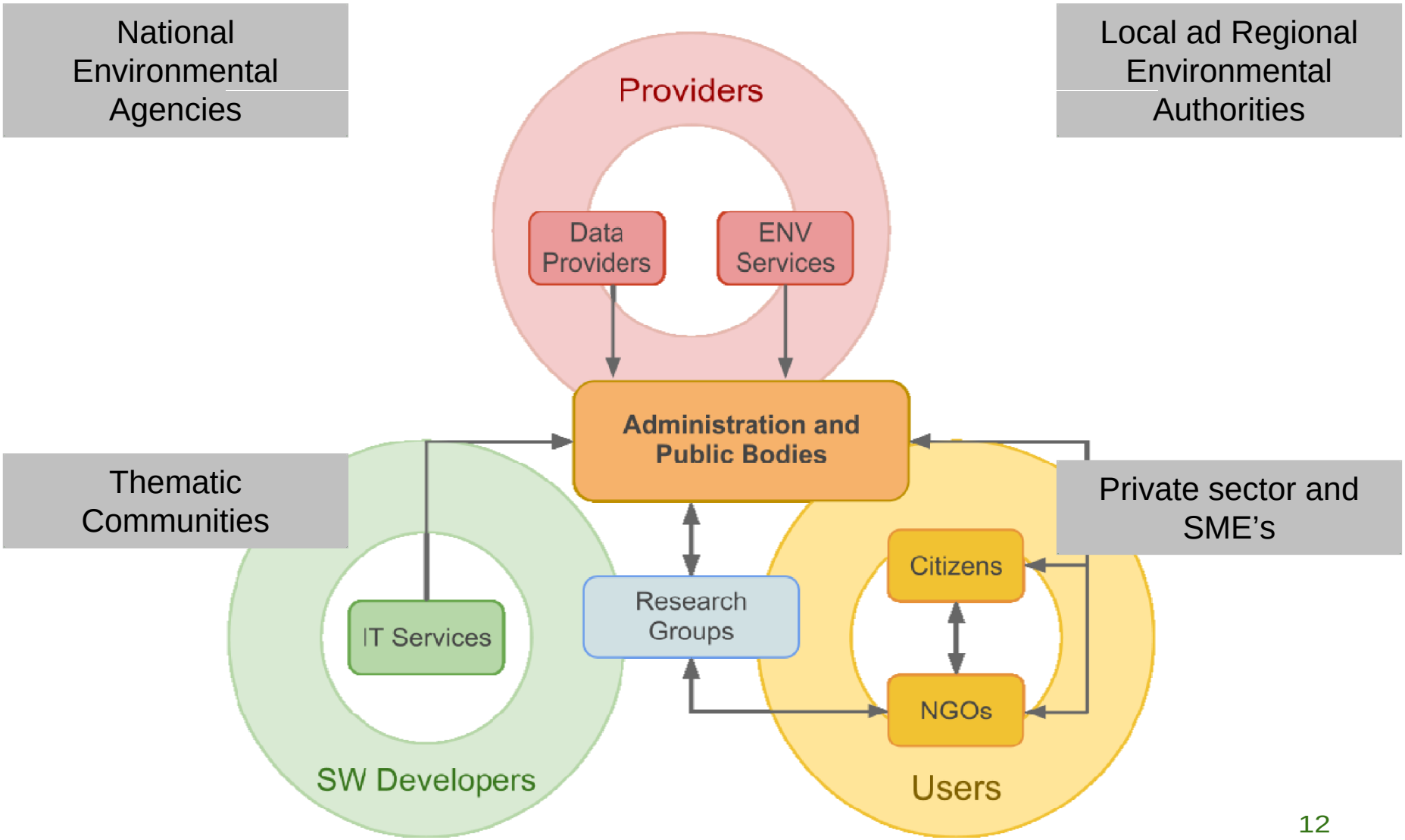
GeoSmartCity

new service

LIFE+IMAGINE

- That will be part of the long term sustainability plan after the project conclusion

Target Groups

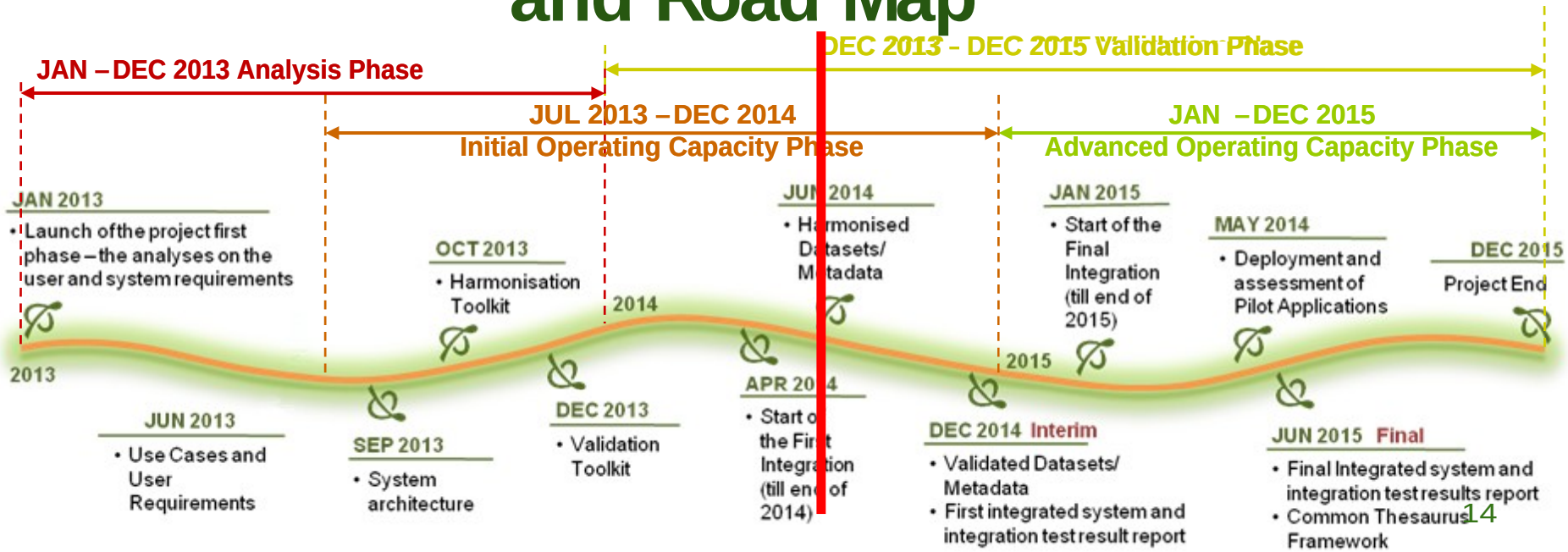


Strategic requirements

- Making the eENVplus services operational means to make operational also the involved stakeholders which have to manage and exploit the designed technological solutions
- ➔ to support the stakeholders for building the capacity in organizing, managing and exploiting these new technologies through a set of actions focused on:
  - Increasing the awareness
  - Sharing the knowledge
  - Stimulating the cooperation and collaborations
- ➔ exploitation of a Training framework

Macro-actions foreseen by eENVplus

and Road Map

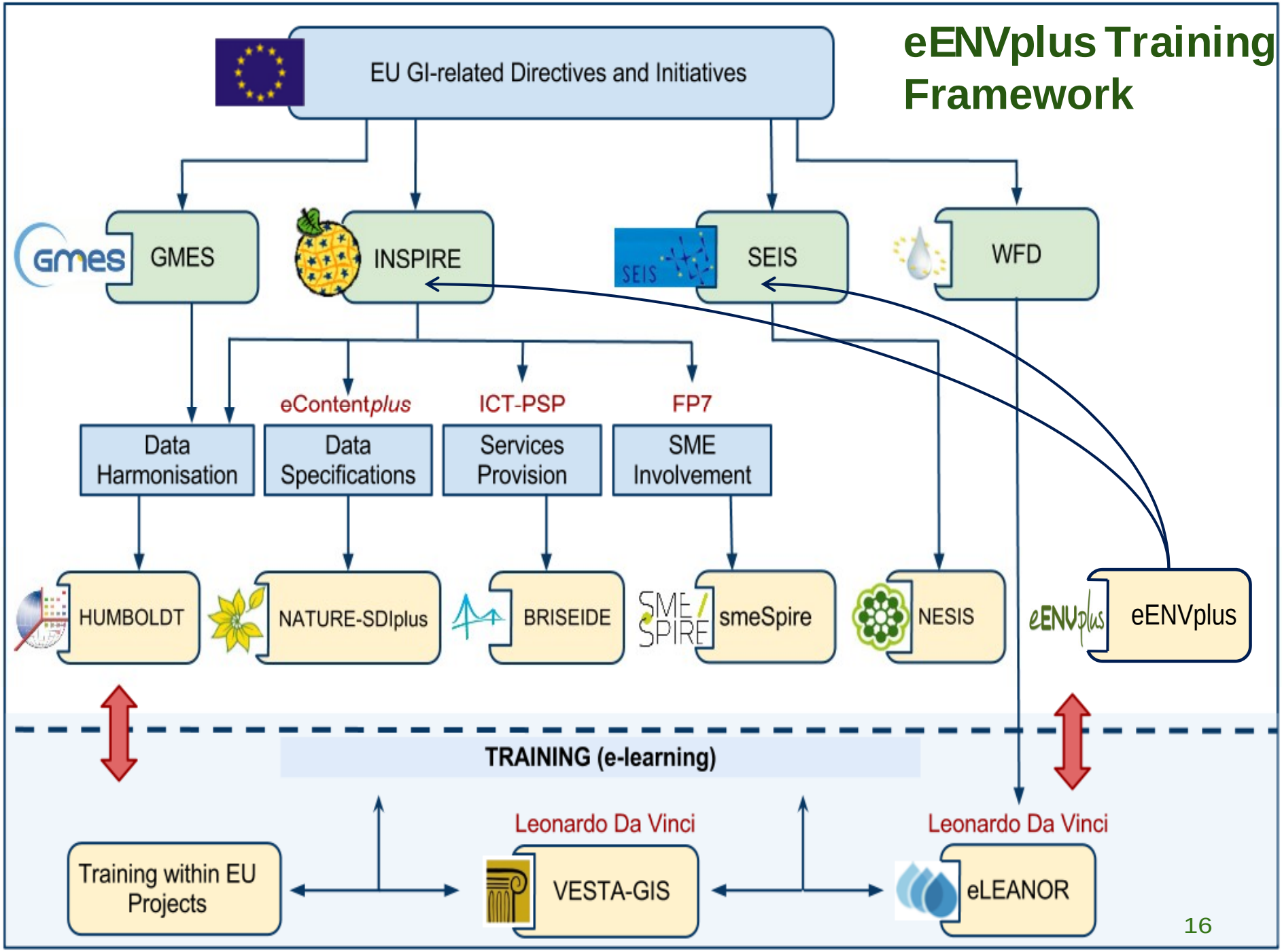


Objectives

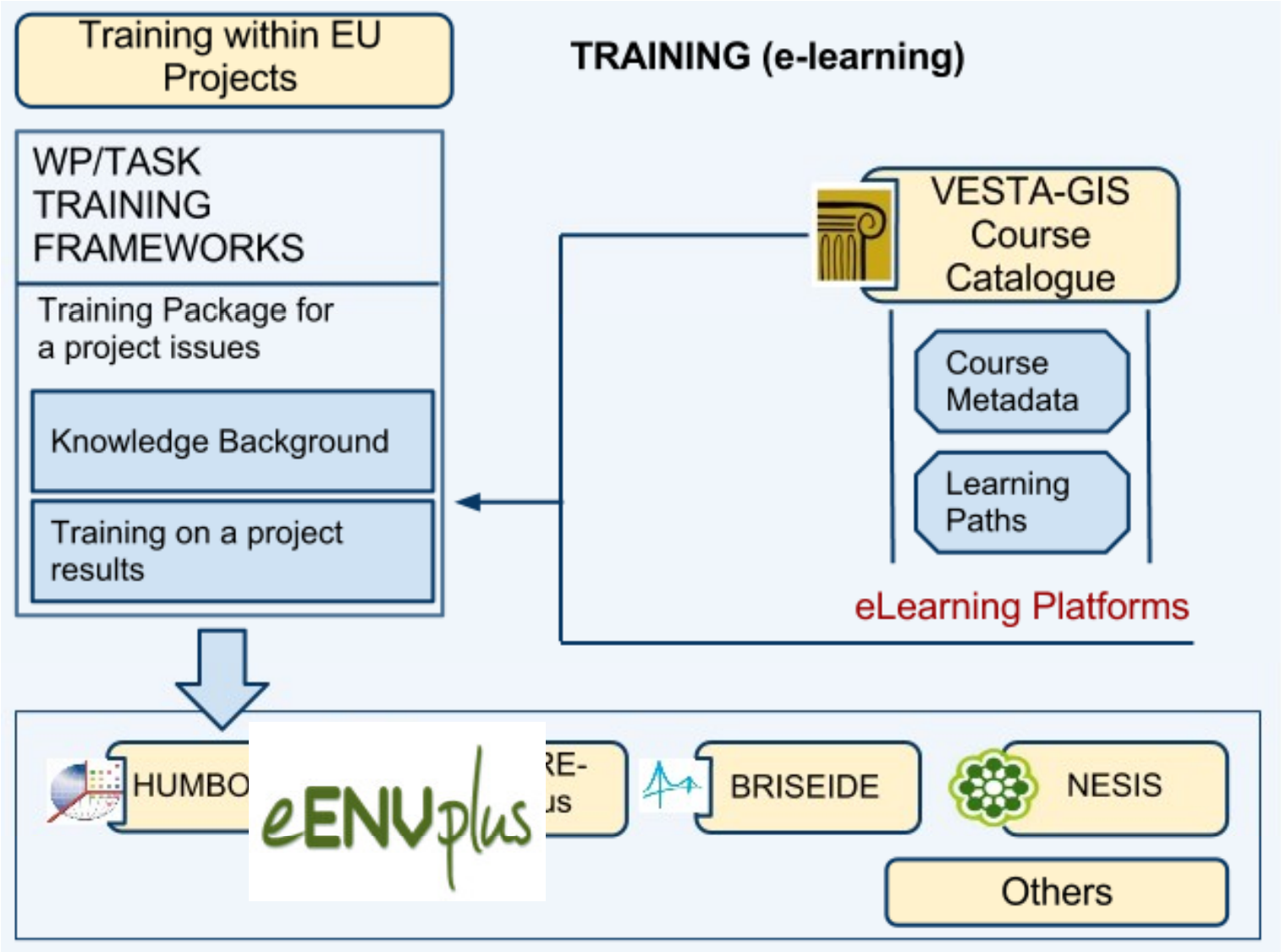
- To define customised, flexible Learning Paths for different profiles of stakeholders, built up upon a selection of the portfolio of training modules offered within the eENVplus
- Cluster with other initiatives (LINKVIT and smeSpire)

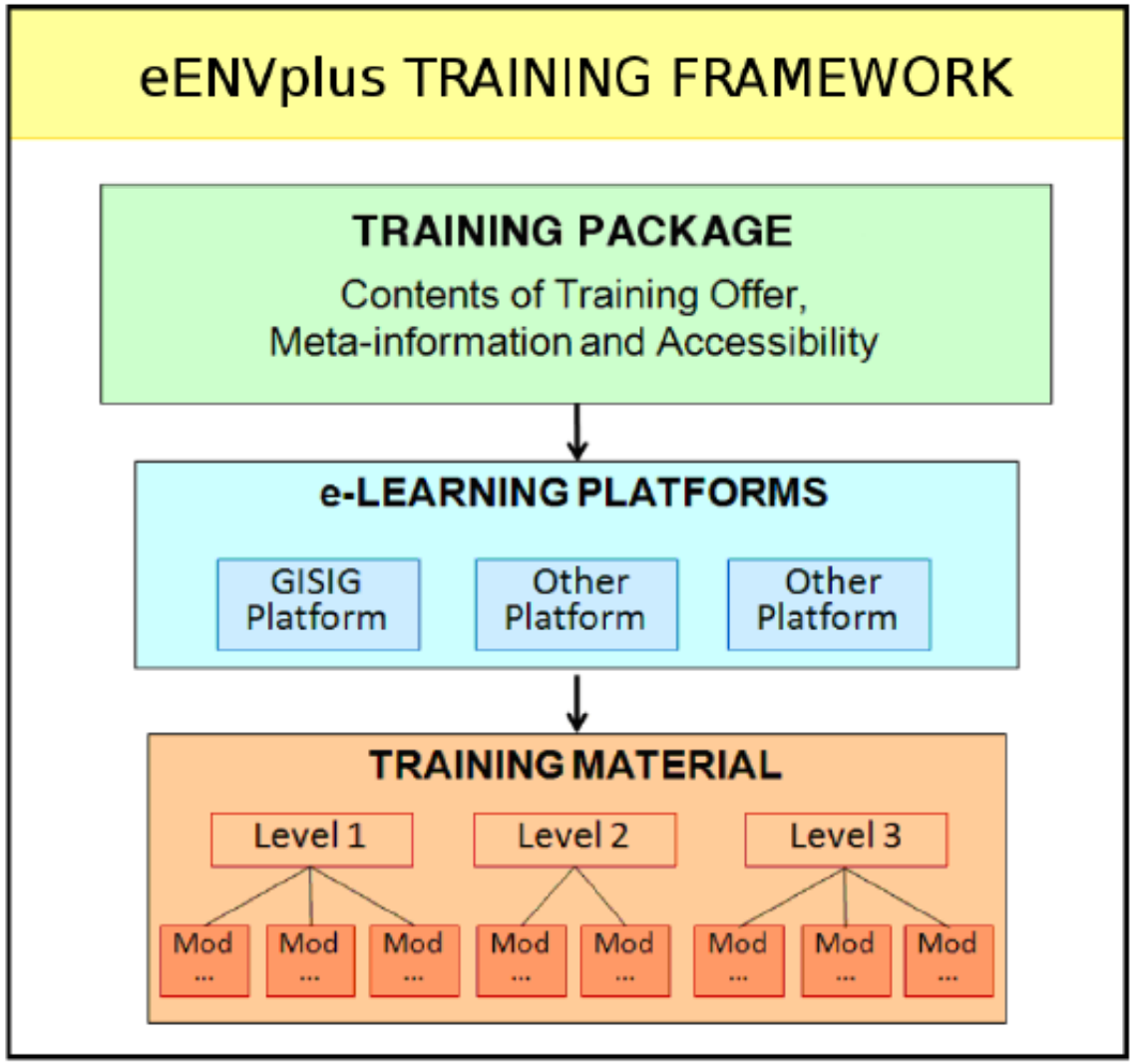
- Training Framework, based on **eLearning** platform to
  - support the basic background knowledge and skills around INSPIRE and related technical issues
  - support the use and exploitation of the project results towards the respective target audiences, with the use of advanced training tools

eENVplus Training Framework



Training Framework (e-learning)




eENVplus TRAINING FRAMEWORK
TRAINING PACKAGE
Contents of Training Offer,
Meta-information and Accessibility
e-LEARNING PLATFORMS
GISIG Platform
Other Platform
Other Platform
TRAINING MATERIAL
Level 1
Level 2
Level 3
Mod ...
Mod ...
Mod ...
Mod ...
Mod ...
Mod ...
Mod ...
Mod ...

Training Frameworks Content (before eENVplus)

	HUMBOLDT	NatureSDIplus	BRISEIDE	nesis
Number of Modules	**18**	**13**	**19**	**2**
Modules developed in the project	**15**	**8**	**14**	**2**

- Portfolio of Training Modules: 56 (including other VESTA-GIS modules)
- Users: about 500 users registered to access the modules on the e-learning Platform

On going Leonardo da Vinci project LINKVIT - ‘‘Leveraging Inspire Knowledge into Vocational Innovative Training’’,

- To update the VESTA-GIS infrastructure and to revise a kernel package of training modules, related to INSPIRE

- Liaison with eENVplus and other Training initiatives

Partners: GISIG (IT), ISPRA (IT), EPSILON (IT), IUAV (IT), PLUS – Salzburg Univ. (AT), KU LEUVEN (BE), NOVOGIT (SE)

Creation of training curricula

- Different Training Curricula have been defined according to different levels of skills and knowledge requirements for the different roles within the eENVplus implementation process.
- The development of the curricula is partially based on the experience gained in other EU-projects and on a survey launched in parallel with the definition of the User requirement.
- The curricula consist of a number of knowledge areas which are organized in logical units (Training Modules), and which allow establishing learning paths in view of pre-defined outcomes.

Training Topics

Training needs survey on the following training topics

- INSPIRE
- SEIS
- Water Directives
- Environmental monitoring
- Air pollution monitoring
- Nature conservation
- Forest fire management
- Environmental risk management
- GI standards
- OGC Web Services
- Data and metadata harmonization
- Data and metadata validation
- Linked Open Data
- Environmental Thesauri
- eENVplus infrastructure
- eENVplus services
- Mobile mapping

Training content and

eENVplus Training Framework

Training Module Metadata

Metadata structure discussed and agreed in synergy with other projects (LINKVIT and smeSpire), in a clustering training perspective, to allow interoperability of training modules within different project Training Frameworks.

- **Module Abstract – aim and objectives**
- **Reference Partner - author**
- **Source / Ownership – rules of use and exploitation of the module**
- **Module description – content specification**
- **Knowledge offered – learning outcomes**
- **Intended Audience – target group(s)**
- **Structure of the Module – table of contents**
- **Pre-requisites - prior learning**
- **Language**
- **Format – type of learning units**
- **Duration – expected workload**

Level 1 – Background Knowledge

Training Modules List	*Training topic(s)*
1.1 Data Harmonisation This module explains the basic concepts of data harmonisation in general and specifically schema translation.	Data and metadata / Harmonisation
1.2 Introduction to INSPIRE The aim of this module is to introduce the INSPIRE Directive, its background, development and expected impact.	INSPIRE
1.3 Basics of INSPIRE Data Specifications The module aims to teach participants on the INSPIRE data specification development approach. The module explains the standardized approach, the different interoperability components to be taken into account and how this was implemented in INSPIRE. The different steps are described in detail and illustrated with examples in the field of biodiversity. Demonstrations and hands-on exercises are part of the module in order illustrate the method and test it on some use cases.	INSPIRE / GI standards
1.4 Basics of INSPIRE Network Services The module introduces the concept of a Service Oriented Architecture (SOA). It describes and illustrates the 5 types of INSPIRE network services (discovery, view, download, transformation and invoking). It explains the link to existing standards of ISO and OGC (e.g. CSW) and also discusses the INSPIRE implementing rules that are applicable including conformity aspects	INSPIRE / OGC Web Services / GI standards

Level 1 – Background Knowledge

Training Modules List	*Training topic(s)*
1.5 Procedures for Data and Metadata Harmonisation This Module explains how to transform heterogeneous source datasets and metadata according to the relevant INSPIRE target schemas.	Data and Metadata harmonization / INSPIRE
1.6 Towards the ICT implementation of SEIS The module introduces to the SEIS requirements as defined in the NESIS project, to proposed SEIS ICT Components and to the available options of the ICT services that are proposed for the SEIS Implementation. Issues regarding the relationship between SEIS and INSPIRE as well as the SEIS specificity are also provided.	SEIS / INSPIRE
1.7 Good Practices for Environmental Management This module refers to the catalogued Good Practices proposed by the NESIS network members and chosen because they refer to carried out projects which led to an operational improvement of ICT aspects of environmental data management (technology, procedures, methods). The catalogue aim is to provide an on-line inventory of existing operational practices, from which it is possible to derive transferable experience for a wide users' audience of stakeholders.	SEIS / Environmental monitoring
1.8 Linked Data The objective of this training module is to acquire know how on the basic concepts of Linked Data principle. Linked data paradigm is employed to implement the Thesaurus Framework for the Environment in eENVplus project which would be employed for metadata compilation and data discovery.	Linked Open Data
1.9 Standards in Geographical Information (wiki resource as support documentation) Standards play an important part in the development of Information, Communication and Spatial Technology (ICST), in particular to resolve interoperability issues. Fifty or more standards have been created in the field of Geographic Information (GI).	GI standards /OGC Web Services

Level 2 –Thematic Knowledge

Training Modules List	*Training topic(s)*
2.1 Risk Management This module is based on the state of the art, main strategies and knowledge on Risk Management, reporting relevant international standards and practical experiences.	Environmental risk management Thematic domain
2.2 Water Directives The module aims at providing information primarily on Water Framework Directive (WFD) and its relative aspects within the Water EU Legislation Framework. It includes two self-study components providing knowledge on the WFD (2000/60/EC) and the related daughters and sisters directives.Its purpose is to spread the awareness of the EU Water Legislation Framework to the interested audience, aspiring to inspire public to be educated in this aspect, as the legislation touches important part of their life.	Water Directives Thematic domain
2.3 Nature Conservation and Natura 2000 Network The objective of the module is, at first, to give an overview of the most significant policies relevant to protected sites management and biodiversity conservation at the International and European level. Particular attention is committed to the EU most significant nature conservation policy: the NATURA 2000 Network. Additional lectures are related to other EU and International Policies on Nature Conservation (RAMSAR, IUCN, OSPAR…..).	Nature Conservation Thematic domain

Level 2 –Thematic Knowledge

Training Modules List	*Training topic(s)*
2.4 Nature Conservation and INSPIRE The module focuses on the role of the INSPIRE Directive in the field of nature conservation, providing a brief introduction to the four INSPIRE themes related to nature conservation and considered by the NATURE-SDIplus Project. Therefore, the module gives an overview on the main provisions coming from the Protected Sites data specification guidelines (INSPIRE, 2009 – D2.8.1.9). Additional lectures are the definitions given by INSPIRE for the four data themes on nature conservation (Protected Sites, Bio-geographical Regions, Habitat and Biotopes, Species Distribution).	Nature Conservation INSPIRE Thematic domain
2.5 Geological Data Harmonisation The Module is focused on: Spatial data definition; it refers to specific definition of geological data into INSPIRE directive and OGC GeoSciML standard. Harmonisation issues across political boundaries; it refers to evidence problems and solutions in the cross-border area.	INSPIRE Data and metadata harmonization Thematic domain

Level 3 - The eENVplus Infrastructure

Training Modules List	*Training topic(s)*
3.1 Examples of Data Transformation This module provides transformation examples of a source dataset into a dataset compliant to the INSPIRE Data Specifications.	INSPIRE / eENVplus infrastructure
3.2 Metadata and Data validation for INSPIRE This module provides validation examples of datasets and metadata against the Requirements of the INSPIRE Data Specifications.	Data and metadata validatiton / INSPIRE / eENVplus infrastructure
3.3 The eENVplus Architecture The objective of this training module is to offer a clear idea of the eENVPlus system architecture, the set of components that are available to support the stakeholders from the initial (harmonization and manipulation of original data) to the ending (visualization of data according with INSPIRE directive) phase. The aim of this module is to provide a set of guidelines that can be used to design INSPIRE compliant SDIs.	eENVplus infrastructure / INSPIRE
3.4 The eENVplus Thesaurus Framework The objective of this training module is to offer a clear idea of the Thesaurus Framework for the environment developed in eENVplus: the set of components (content and services) that are available to support the stakeholders in the metadata compilation as well as data discovery phase. This module is an user guide for the eENVplus Thesaurus Framework with the aim of describing each of the provided services in terms of how to properly use them, what kind of input is requested and what kind of output is expected.	eENVplus infrastructure **/** Environmental Thesauri

Level 3 - The eENVplus Infrastructure

Training Modules List	Training topic(s)
3.5 The eENVplus services This module is an user guide for the eENVplus services.The aim is to describe each of the provided services in terms of how to properly use them, what kind of input is requested and what kind of output is expected.	eENVplus services
3.6 eENVplus catalogue and connection to operational infrastructures The objective of the training module is to provide hints on how to configure and parametrize Discovery services to be included into the harvesting mechanism of the eENVPlus catalogue (derived from the INSPIRE geoportal implementation), and to provide information on how the harvested information is catalogued and presented to the users in order to optimize metadata for the presentation. In addition, an overview of the attached external services will be given.	eENVplus infrastructure
3.7 Mobile Mapping and advanced visualisation The objective of this training module is to acquire know how on the basic concepts of mobile mapping. Mobile mapping will be used to increase the number of information provided by eENVPlus by the use of a Crowdsourcing app for mobile devices. The second part of the module is devoted to the use of the Augmented Reality functionality provided by the eENVPlus mobile App, that allows to visualize data provided by the mobile mapping module on the real representation of the environment.	Mobile mapping / eENVplus Infrastructure

Components of the eENVplus services Modules

Training Modules List	*Training topic(s)*
eENVPlus Web Processing Services	eENVplus services
eENVPlus Crowdsourcing Services	eENVplus services
eENVPlus Ingestion service	eENVplus services
eENVPlus Notification service	eENVplus services
eENVPlus Data access services	eENVplus services
eENVPlus Validation service	eENVplus services

Level 4 – eENVplus Scenarios

Training Modules List	*Training topic(s)*
4.1 Implementation of a SEIS for air quality data	SEIS / Air pollution monitoring
4.2 Providing INSPIRE-compliant access to utility services: the case of sewage networks in Flanders	Water Directives /INSPIRE
4.3 CSspire	Environmental monitoring
4.4 Natural Areas INSPIRE Compliance Toolbox	Nature conservation
4.5 Forest Fire Management Scenario	Environmental risk Management /Forest fire management
4.6 Window on the Protected Areas - Mobile Conservation Map (WMA MCM)	Nature conservation / Mobile mapping
4.7 INSPIRE Geoportal	Nature conservation / INSPIRE
4.8 Geological Map Harmonization	Environmental risk management
4.9 Urban Landuse Planning: INSPIRE'd land use planning Indicators to monitor good urban planning practices	INSPIRE /Environmental Monitoring

Learning paths

- Managers
- Professionals
- End users

Managers

Recommended core training modules	Optional modules
Context knowledge	
1.1 Data and metadata harmonization	1.3 Basics of INSPIRE Data Specifications
1.2 Introduction to INSPIRE	1.4 Basics of INSPIRE Network Services
1.8 Linked Data	1.6 Towards the ICT implementation of SEIS
	1.7 Good Practices for Environmental Management
	Level 2 Modules, according to the thematic interest
Project specific	
3.3 The eENVplus Architecture	Other modules of Level 3
	Level 4 Modules, according to the thematic interest

Professionals

Recommended	Optional
Context knowledge	
1.1 Data and metadata harmonization	1.8 Linked Data
1.2 Introduction to INSPIRE	Level 2 Modules, according to the thematic interest
1.3 Basics of INSPIRE Data Specifications	
1.4 Basics of INSPIRE Network Services	
1.5 Procedures for Data and Metadata Harmonisation	
1.9 Standards in Geographical Information	
Professional modules	
3 The eENVplus infrastructure	1.6 Towards the ICT implementation of SEIS
3.1 Example of Data Transformation	1.7 Good Practices for Environmental Management
3.2 Metadata and Data validation for INSPIRE	Level 4 Modules, according to the thematic interest
3.3 The eENVplus architecture	
3.4 The eENVplus Thesaurus Framework	
3.5 The eENVplus services	
3.6 eENVplus catalogue and connection to operational infrastructures	
3.7 Mobile Mapping and advanced visualisation	

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eENVplus Training

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- eENVplus Project
- eENVplus Services
- eENVplus Pilots
- eENVplus Training
- eENVplus Factsheet

The eENVplus Training Framework

A Training Framework will be designed as a cornerstone of the project to make available existing knowledge and transfer developed skills to the target groups of users. In this context, training activities will strictly complement and support dissemination and exploitation, fostering Capacity Building.

Training will be implemented through an **open source e-learning platform** offering a training package based on specific and thematic vocational training curricula and different learning paths aiming at maximising the re-use of existing tools and training materials successfully tested in the frame of previous EU funded projects.

Training Impact

Our training will provide to the target audience of eENVplus (especially National/Regional Environmental Agencies) the **advanced skills required to cope with the INSPIRE implementation** process, knowledge related to the new ICT dimension of the environmental data (e-environment) and the documentation and the necessary means to interact, benefit and adopt the eENVplus Infrastructure.

The eENVplus Training Modules

The Training Package is organised in the following levels:

Level 1: Background Knowledge
Knowledge on Directives/ Technologies

- Data Harmonisation
  This module explains the basic concepts of data harmonisation in general and specifically schema translation.
- Introduction to INSPIRE
- Basics of INSPIRE Data Specifications
- Basics of INSPIRE Network Services

Thanks for your attention!

You are all invited to join the eENVplus network

www.eenvplus.eu