ENOS - ENabling Onshore CO_2 Storage in Europe - H2020 project

Marie GASTINE

BRGM

Context

To meet its emission reduction targets, Europe cannot rely only on offshore storage.

Main challenge still facing onshore CCS :

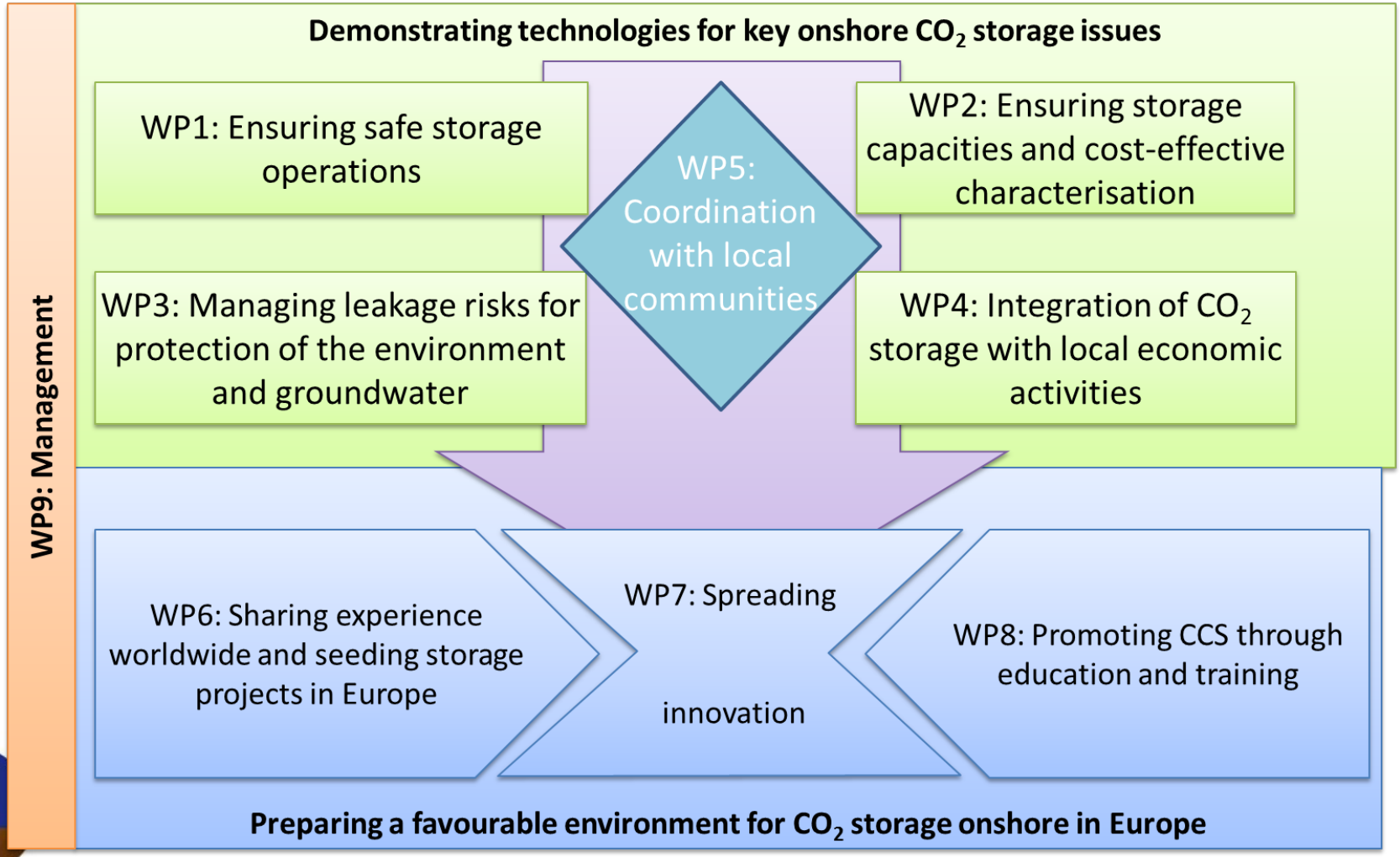
- Demonstration through practical experience that injection operations can be run safely and efficiently onshore, in a positive regulatory environment;
- Ensuring reliability of storage
- Demonstrating our capacity to understand, detect and manage potential leakage risks
- Integrating CO_2 storage into the local economic activities so that the benefits are also reflected at the local scale

Objectives

The objective of the project is to enable the development of CO_2 storage onshore in Europe by:

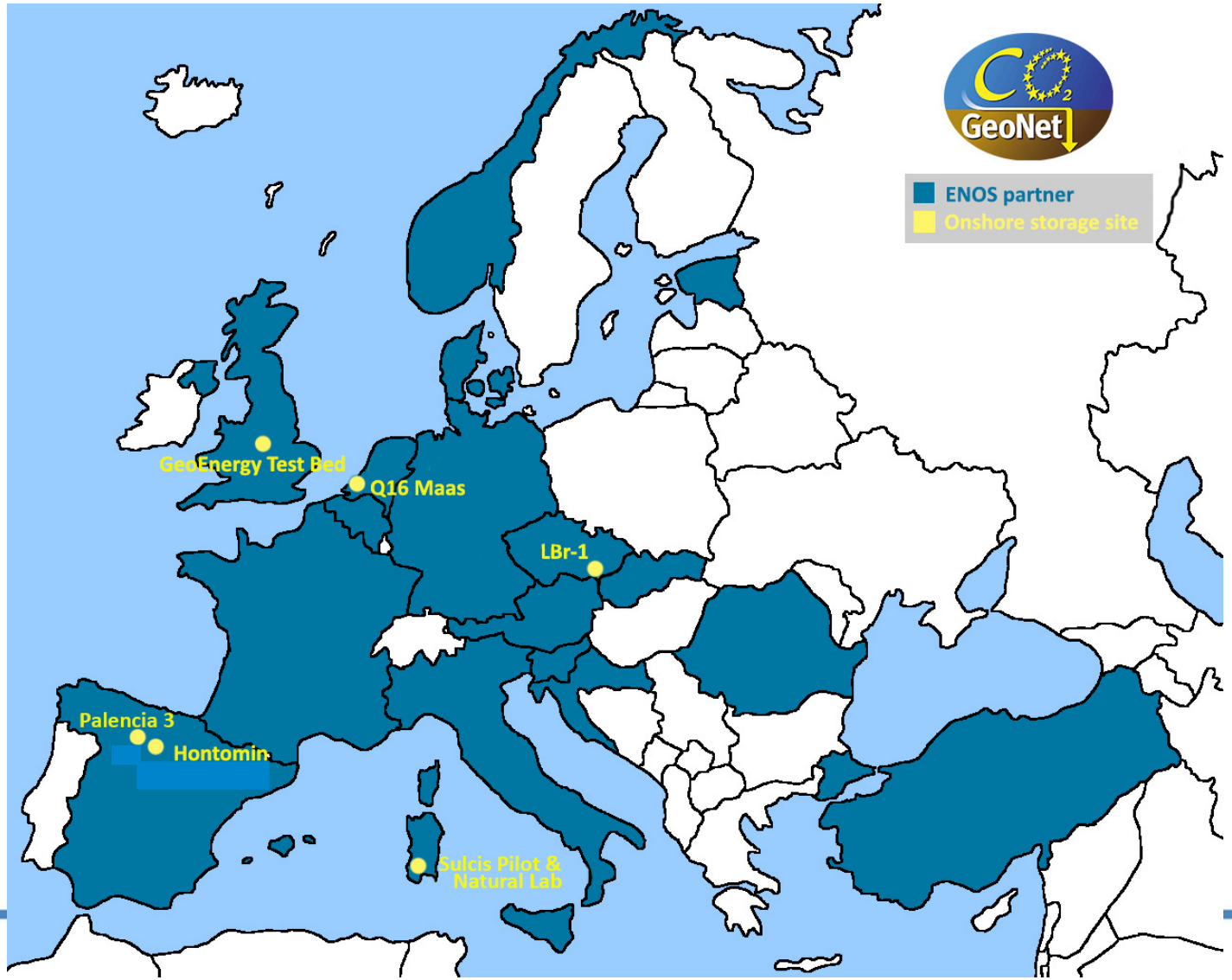
- **Developing, testing and demonstrating in the field, under "real-life conditions", key technologies specifically adapted to onshore contexts.**
- **Contributing to the creation of a favourable environment for onshore storage across Europe,**
  - supporting knowledge sharing
  - integrating research results and setting out best practices on key topics based on the findings from real-life experiments
  - supporting the preparation of new pilot projects and upscaling from pilot to demonstration,
  - bringing innovation to society through dialogue and communication
  - promoting CCS through training and education.

Work plan



GeoNet

Sites



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ENOS SITES

- Hontomin
  - Earlier presentation (today at 9.30) and tomorrow at 16:40
- GTB
  - tomorrow at 17:00
- LBR 1
  - Previous presentation and tomorrow from 15:00
- Q16maas
  - Tomorrow at 17:20
- Sulcis Pilot and Sulcis fault lab
  - earlier presentation
- Palencia 3

Palencia 3 exploration permit

Consortium

➔ 13 Research partners:

BRGM

BGR,BGS, Czech Geological Survey, CIEMAT, IRIS, OGS, SGIDS, TNO, Sapienza University of Rome, University of Nottingham

CO_2GeoNet (GBA, GeoEcoMar, GEOINZ, GEUS, GSB-RBINS, Heriot Watt University, IGME, METU-PAL, TTUGI, UNIZG-RGNF)

Site owner:

CIUDEN,

Sotacarbo

Consortium

6 industrial partners:

- Technology providers:

Flodim (fluid sampler)

IDIL fibres optiques (Downhole CO2 sensor)

NHAZCA (ground deformation monitoring tool)

Silixa (IDAS)

- CO2 storage engineering

Geogreen

- Site operator

Palencia 3 (Enagas, Gas natural Fenosa, IPF)

CIUDEN

HONTOMIN

WP1 objectives
Ensure safe operations

- demonstrate innovative injection strategies and history matching approaches for increased confidence of operators in managing sites safely
- validate microseismic monitoring network data to manage induced seismicity risk
- develop smart integration of the different monitoring data acquired during operation.
- develop an integrated risk management workflow leading to reliable and safe CO_2 storage operation, fulfilling the requirements of the European Directive for CO_2 Storage, in order to meet the needs of regulators, local population and operators
- to perform an integrated approach for the definition of technical guidelines for CO_2 storage operation, through cooperation in R&I of research institutions, industry and service providers.

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WP2 objectives
Ensure Storage capacities and cost effective charcaterisation

- Further investigate potentialities of next-generation 'high resolution' reservoir modelling to assess impact of heterogeneities on CO_2 storage capacities;
- Quantify the reliability of storage capacities estimates;
- Lower characterisation costs through (i) the validation of methodology to optimize exploration program, and (ii) the development of front-end engineering study for low cost drilling

BGS

GTB
Sulcis fault lab
LBR-1

WP3 objectives
managing leakage risks for protection of environment and groundwater

- Improved understanding of leakage and its potential impact to enhance development of monitoring technologies
- identifying and quantifying any CO2 emissions into the atmosphere, using practical experience from real-life sites.
- Advancing targeted monitoring technologies for leakage detection and quantification from TRL 4-5 to TRL 6 or 7.
- Integrating the different tools into a comprehensive monitoring solution with consideration of other state-of-the-art tools

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WP4 objectives integration of storage in local economic activities

to evaluate and develop demonstration of CO_2 storage integrated in other economic activities:

- enhanced hydrocarbon production,
- CO_2 buffering for different types of utilization and CO_2 buffering as part of a CO_2 (shipping) terminal, prior to transport and large-scale storage

WP5 objectives
Coordination with local communities

- To gain the involvement of the local population in the development of best practices by organizing collaborative research processes between lay citizens and experts
- To support the ENOS project in developing best practices which are proven for societal aspects, in particular with regard to safety and potential impacts
- To provide a methodology to link the scientific and technical development of the best practices with societal concerns and implementation issues at local level
- To develop an online public information tool based on input and feed-back from the local population

Preparing a favourable environnement

WP6: CGS

- Knowledge sharing with European and international projects
- Identifying success criteria for new storage sites to be successful;
- Paving the way for pilot sites in the ENOS project portfolio to further develop
- Preparing a Roadmap for upscaling identified synergies of CO_2 storage with CO_2 utilisation

- WP7 IRIS
  - To facilitate research integration and dissemination across WPs
  - To author best practice guidance documents aimed at industrial sector and policy makers to favour market uptake of the research results
  - To promote exploitation of project results among the research community

Preparing a favourable environnement

WP8

CO2GeoNet-GEUS

- Develop intensive training weeks, for young scientists, dedicated to Onshore CO_2 geological storage and the implementation of the EU- Directive
- Build awareness on climate change and opportunities for mitigation action utilising CCS through building e-learning courses
- Initiate a university cooperation on CO_2 storage education and a coordinated Master and post-graduate Master programmes through the development of a network of institutions and laboratories, and the development of educational modules
- Provide short courses for journalists and media to raise awareness on CCS and enhance communication between scientists and journalists.

Key figures

- Status: Under negociation with the EC
- 4 year project, starting Autumn 2016
- H2020 grant: 12.6M€
- Additionnal funding is being sought through sponsorship

Thank you for your attention

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