The role of carbon storage in the Med

The COREu project and Prinos

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The COREu project

COREu - CO_2 Routes across Europe

Period: January 2024 to December 2027 (4 years)

Funding Agency: Horizon Europe

Total budget: 35.7 M€ (EU contribution: 29.3 M€)

Consortium:

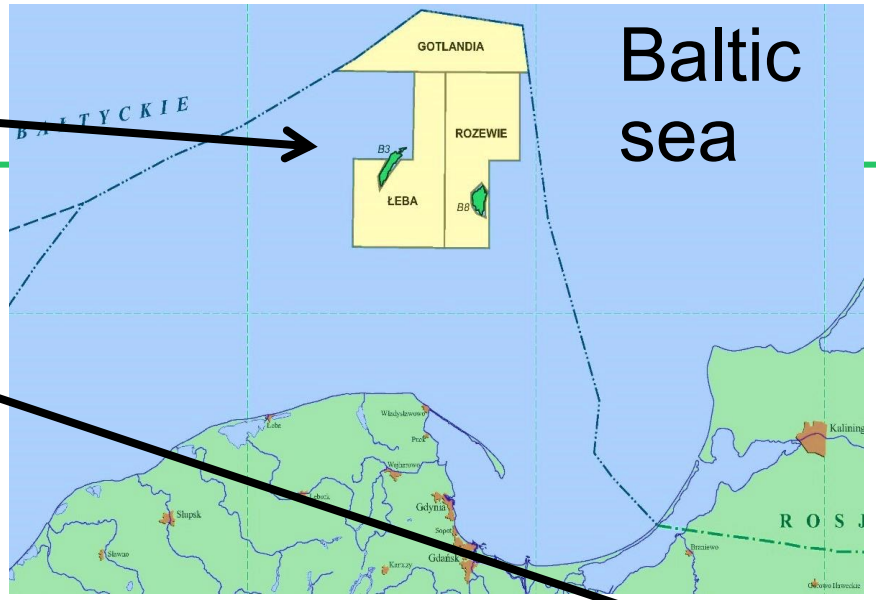
- Lead partner – Sintef Energi AS
- 40 partners, consisting of emitters, technology providers, gas transport systems operators, transportation companies, research institutes and universities

COREu Overview

- demonstrate key technologies for the entire CCS value chain in southern Europe and support the development of CCS routes in central - eastern Europe.
- initiate the development of an open-access, transnational network to connect emitters with storage sites across Europe
- this work that will help promote the necessary demand and investment rationale for the deployment of CCS

Research focused in 4 areas

COREu sites



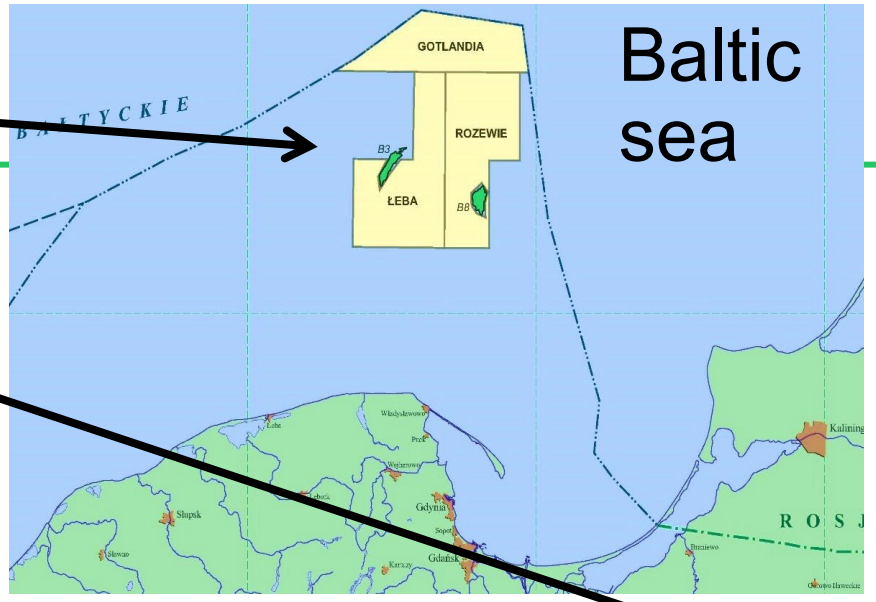
Baltic sea

- Scenarios for efficient, open-access, cross-border CO_2 transport infrastructures will be developed
- Storage capacity, LCA, environmental monitoring and risks will be assessed for all routes

Eastern Czechia

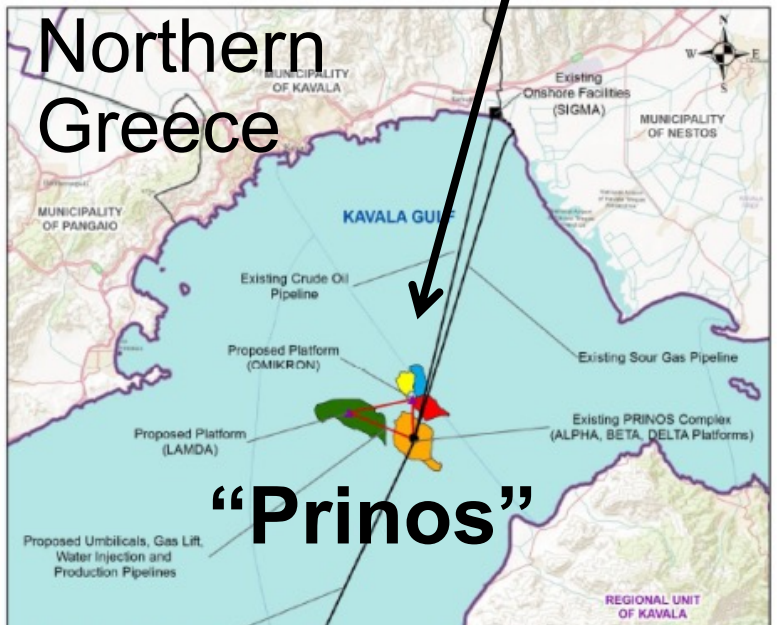
Western Ukraine

COREu sites



Baltic sea

The Prinos off-shore site in north-eastern Greece will be a full-chain demonstration site



Northern Greece

Eastern Czechia

Western Ukraine

COREu – WP2 tasks

WP2 – Core Technologies

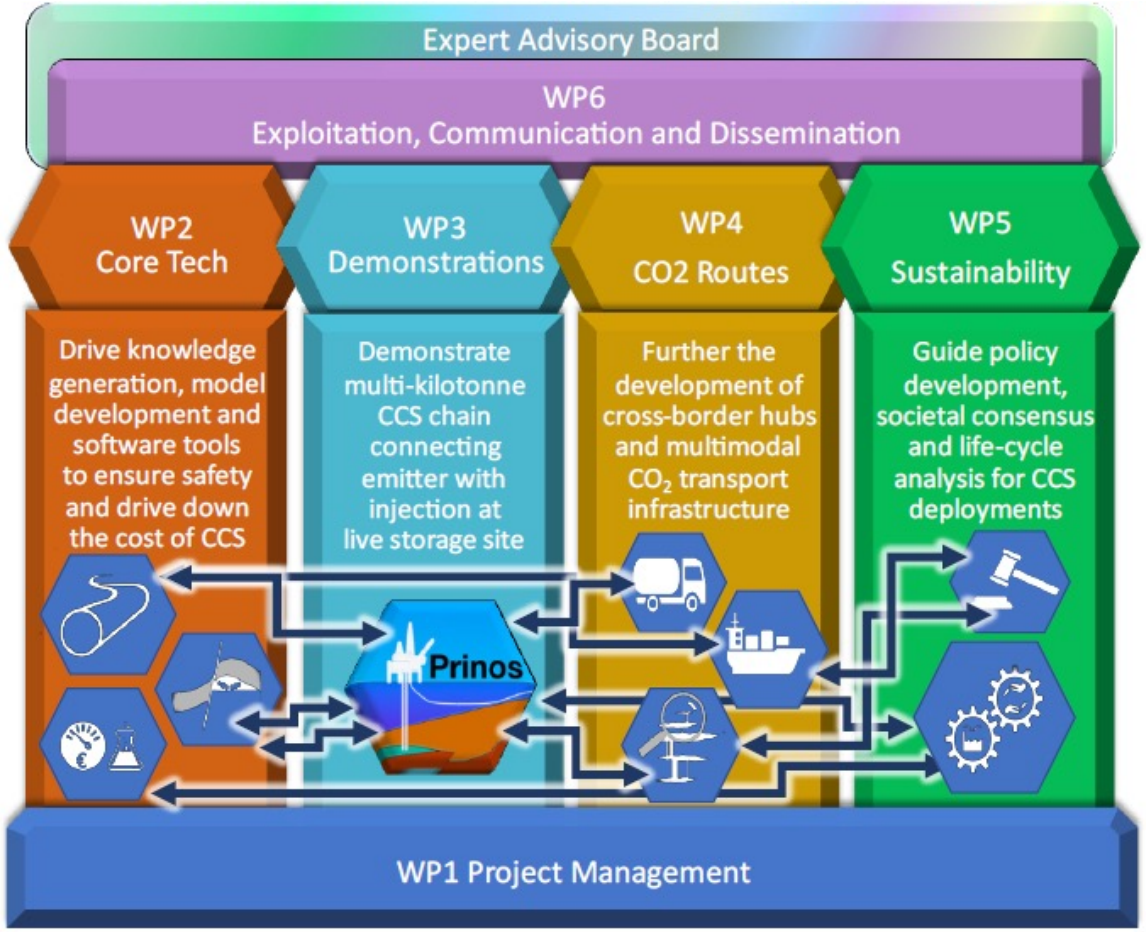
T2.1: CO_2 composition and impact on transport and storage

T2.2: Safe design and operation of CO_2 transport networks

T2.3: Metering and analysis of CO_2 streams

T2.4: Enabling multimodal transport and interoperability

T2.5: Tools to de-risk and optimize storage



COREu – WP3 tasks

WP3 – Demonstrations

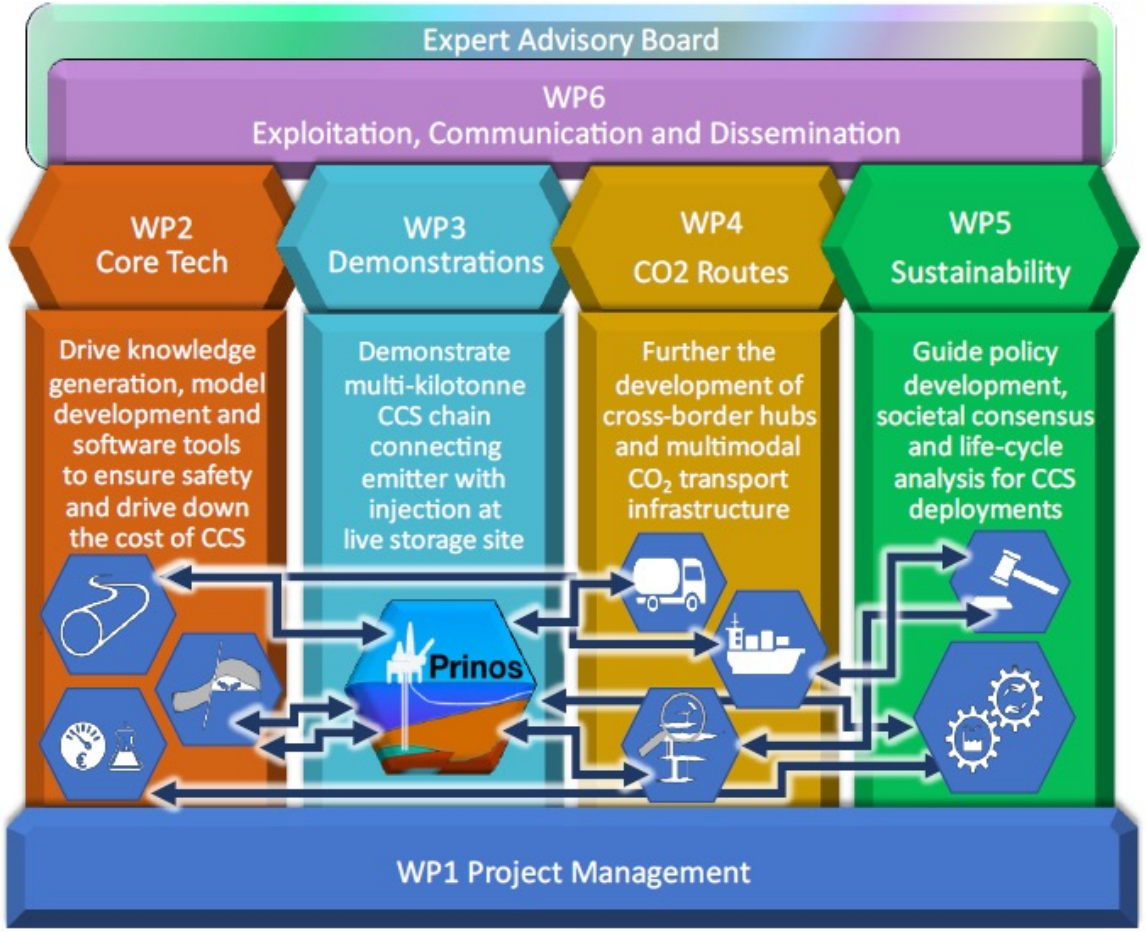
- T3.1 Prinos demonstration

  T3.1.1 Capture

  T3.1.2 Transport

  T3.1.3 Storage

- T3.2 CO_2 transfer and injection systems demonstration



COREu – WP4 tasks

WP4 – CO_2 Routes

T4.1: Regional geological / infrastructure scenarios for CO_2 routes

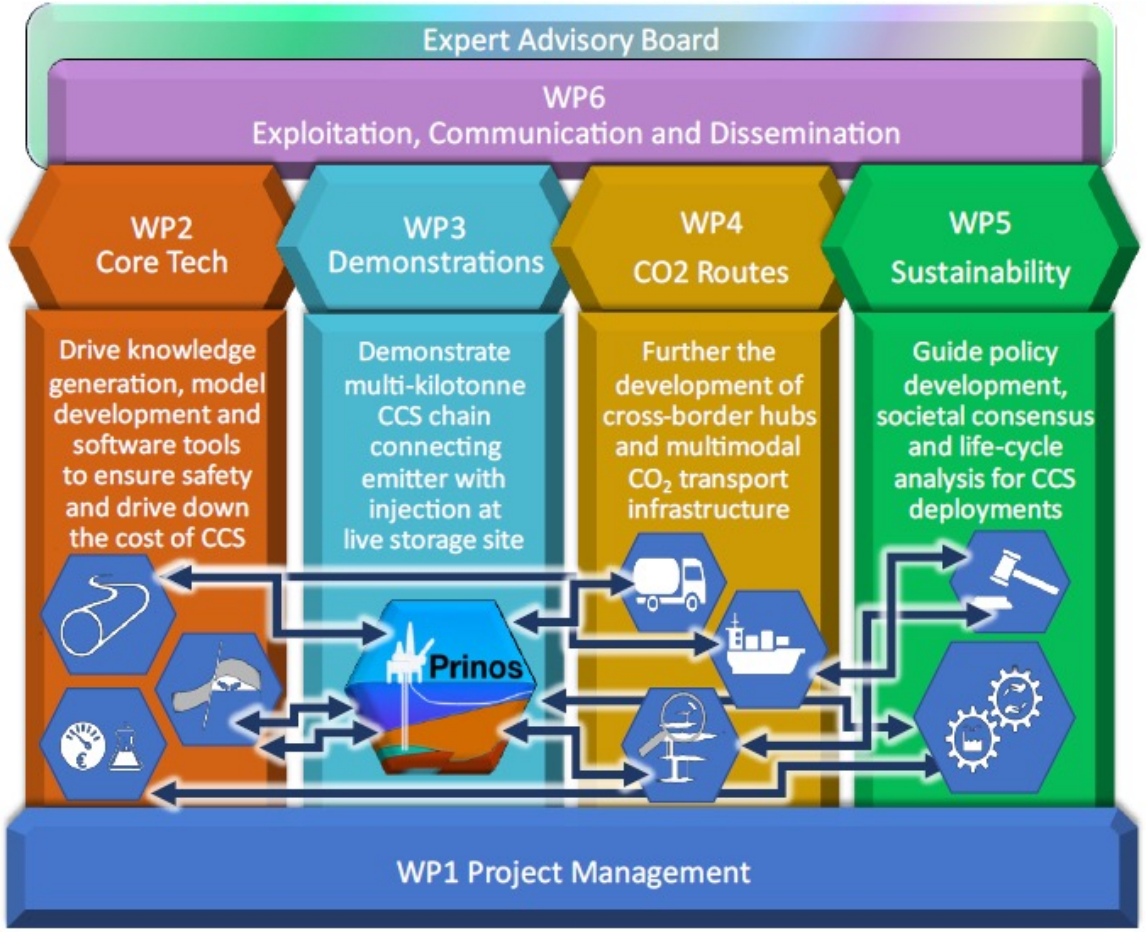
T4.2: Techno-economic evaluations of regional scenarios

T4.3: Cost benefit analysis (including environmental and public health)

T4.4: Governance of regional CCS hubs

T4.5: Optimal deployment of shared, open access CO_2 transport networks

T4.6: Pre-normative input for safety risk management in CCS applications



COREu – WP5 tasks

WP5 – Sustainable development and consensus management

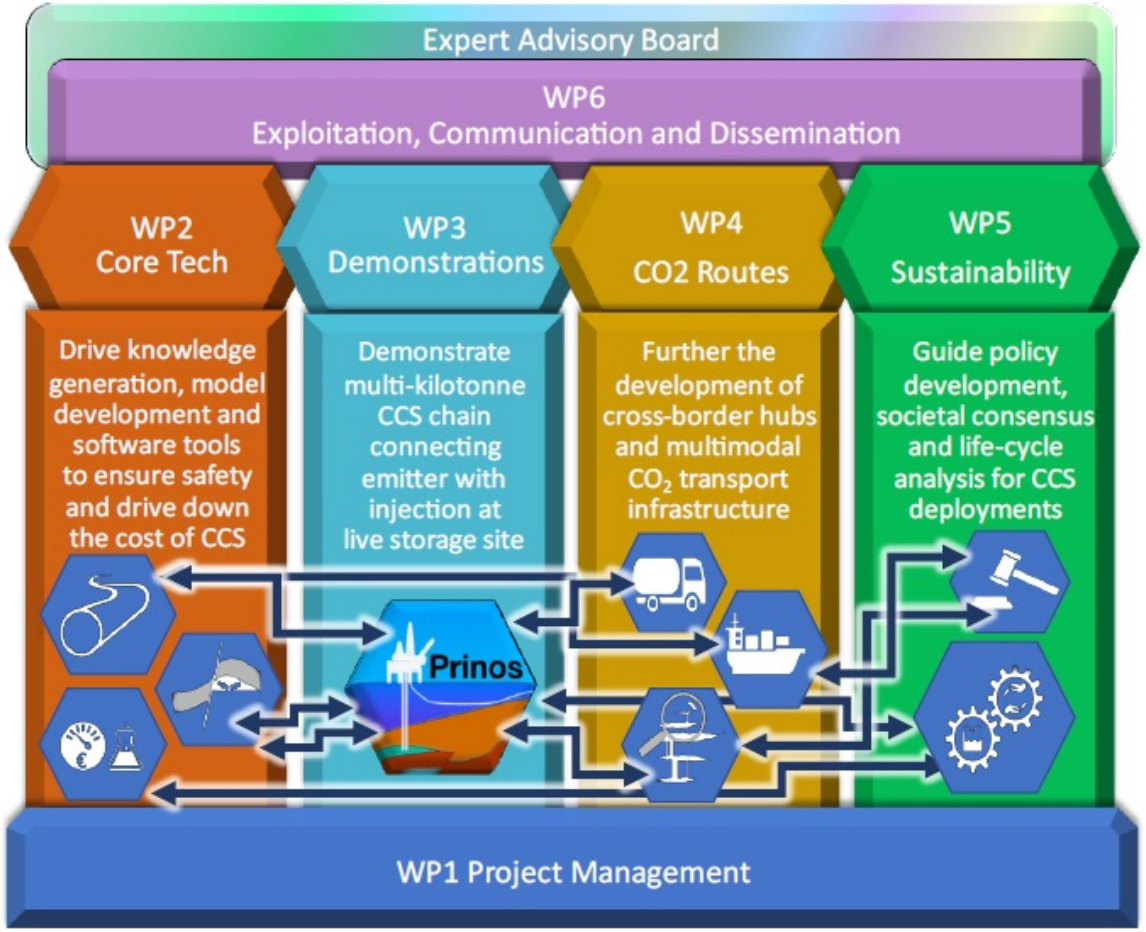
T5.1: Policy framework

T5.2: Social acceptance

T5.3: Environmental assessment

- T5.3.1: Prinos monitoring
- T5.3.2: Monitoring eastern Europe sites
- T5.3.3: Risk studies

T5.4: Life Cycle Assessment (LCA)



Prinos CCS Hub Project – Overview & Timeline

Energean is the operator and has 100% working interest in the Prinos licence

June 2021 – EU endorses Prinos inclusion in Greece's Recovery and Resilience Plan

Sept. 2022 – Energean obtains 22 month licence to explore Prinos as CCS site

Nov. 2022 – estimate of 2.5-3 MTPA CO_2 injection for 25 years

Jan. 2023 – start of EU-funded Herccules project

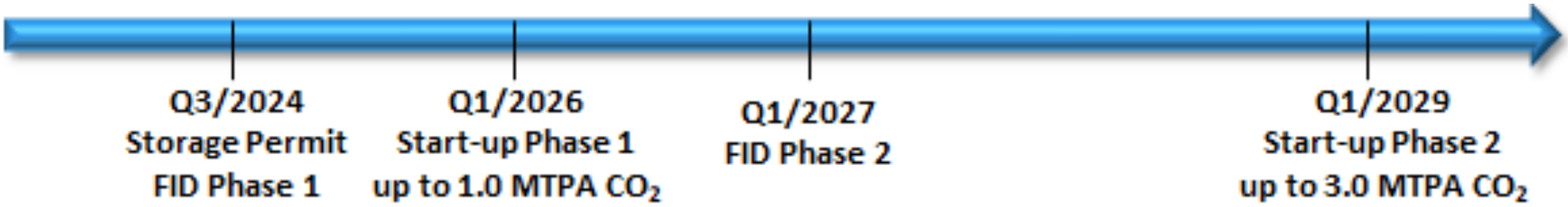
Jan. 2024 – start of EU-funded COREu project

- **Included in European Union list of "Projects of Common Interest"**
- **Energean has signed 8 MOU's with emitters for storage of 4.9 MTPA, above estimated capacity**

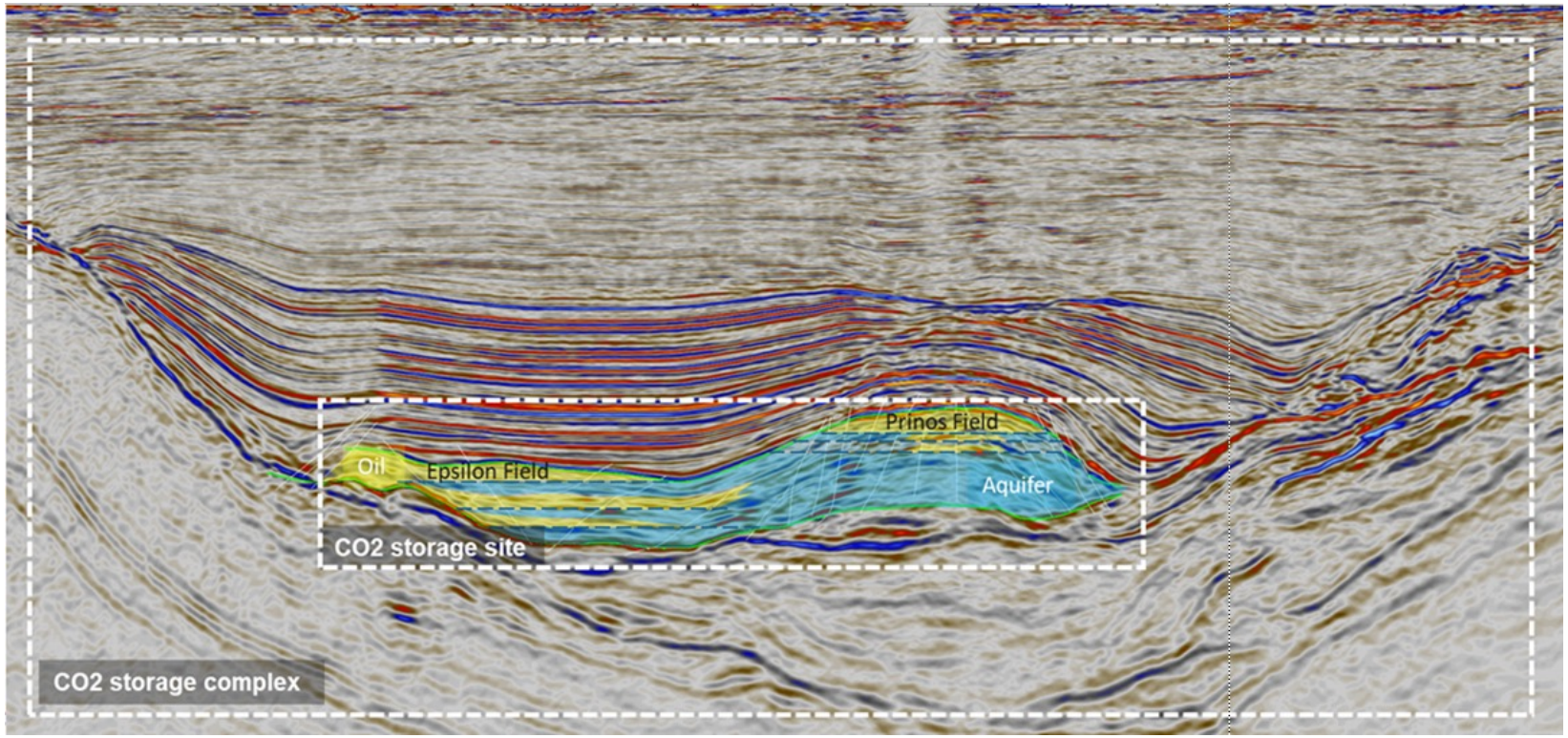
Prinos CCS Hub Project – Overview & Timeline

Project infrastructure will be developed in 2 phases

1. re-purpose existing infrastructure to achieve an injection capacity of 1 Mt CO_2 / year. Will be able to receive CO_2 in compressed form by beginning of 2026 and liquid CO_2 by mid-2027.
2. Increase injection rate to around 3 Mt CO_2 / year of liquid CO_2 in Q1 of 2029, acting as a local and regional storage hub for decarbonizing hard-to-abate industries in SE Europe.



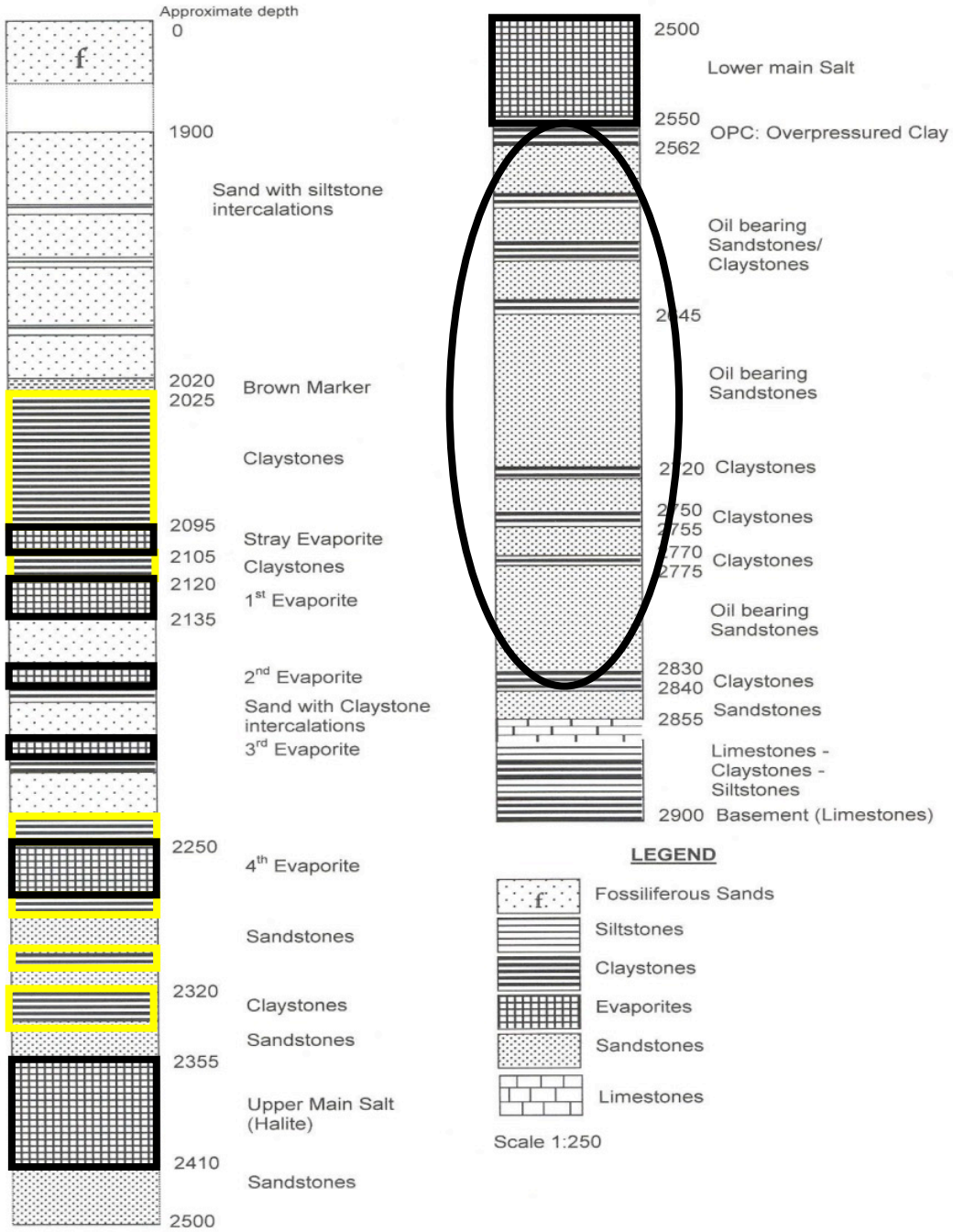
Prinos geology



Reservoir

- The Prinos field is formed by a low relief faulted anticline at 2490 to 2770 m depth.
- Reservoirs are Miocene turbidites and clastic sand-stones in a closed system
- CO_2 injection in saline aquifer underlying Prinos Complex oil fields
- Therefore <u>not</u> EOR

Prinos geology



Caprock

- The Prinos-Kavala basin was filled by an 800 m thick evaporitic and clastic sequence during the Miocene.
- Multiple claystones and seven evaporitic cycles of probably Messinian age form the caprock
- Evaporites are an excellent caprock given their low permeability and seal-sealing capabilities

COREu work at Prinos demonstration

Capture

- CO2 will come from the demo plant to be built in the HiRecord EU project. COREu will design, install, operate the conditioning / compressing station for the transport vessels.

Transport

- containerized compressed gas cylinders will be filled and transported by truck to to Kavala, and then the gas will be transferred offshore for injection (small total volume)

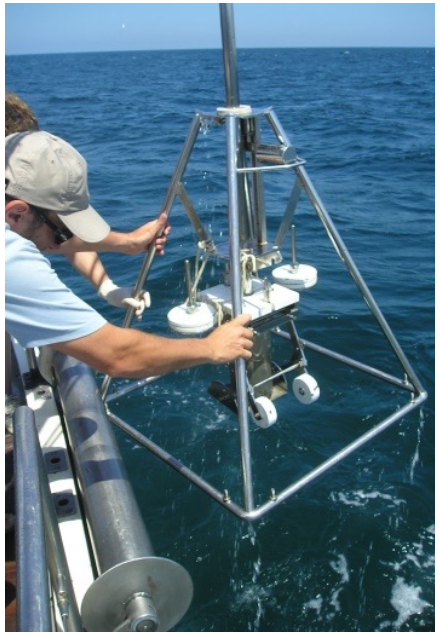
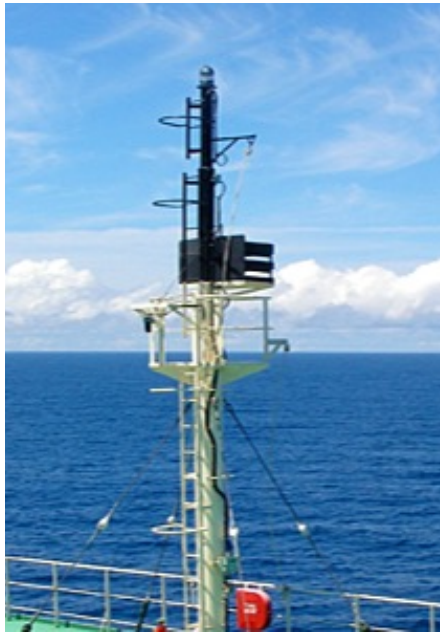
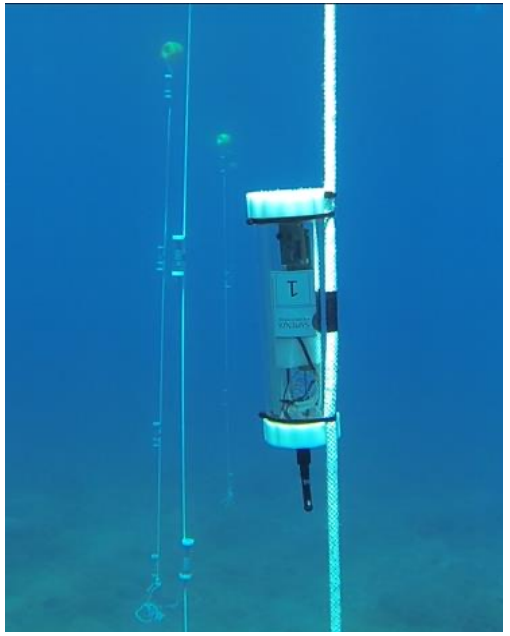
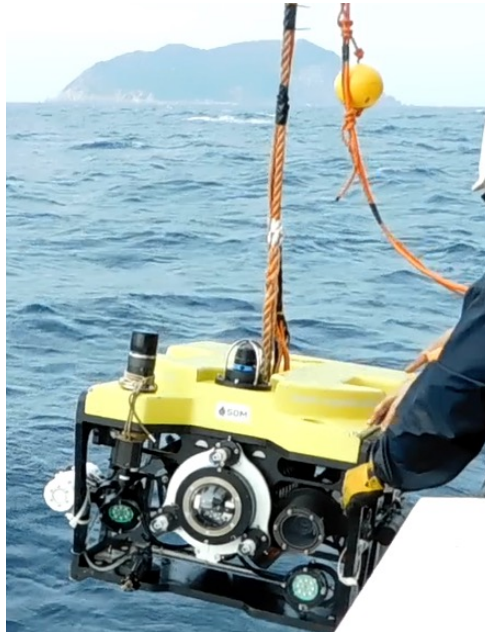
Storage

- Injection at a depth of 2700 to 3000 m.

COREu work at Prinos demonstration

Monitoring

- Seasonal baseline of biological / chemical parameters
- pCO_2 and pH sensors mounted on a mobile AUV platform
- fixed pCO_2 sensors
- Seafloor geophones for microseismic monitoring

Thank you