PilotSTRATEGY, Portugal

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@ International Workshop on Offshore Geologic CO_2 Storage, Bergen, Norway, 20-22 April 2026

PilotSTRATEGY Project

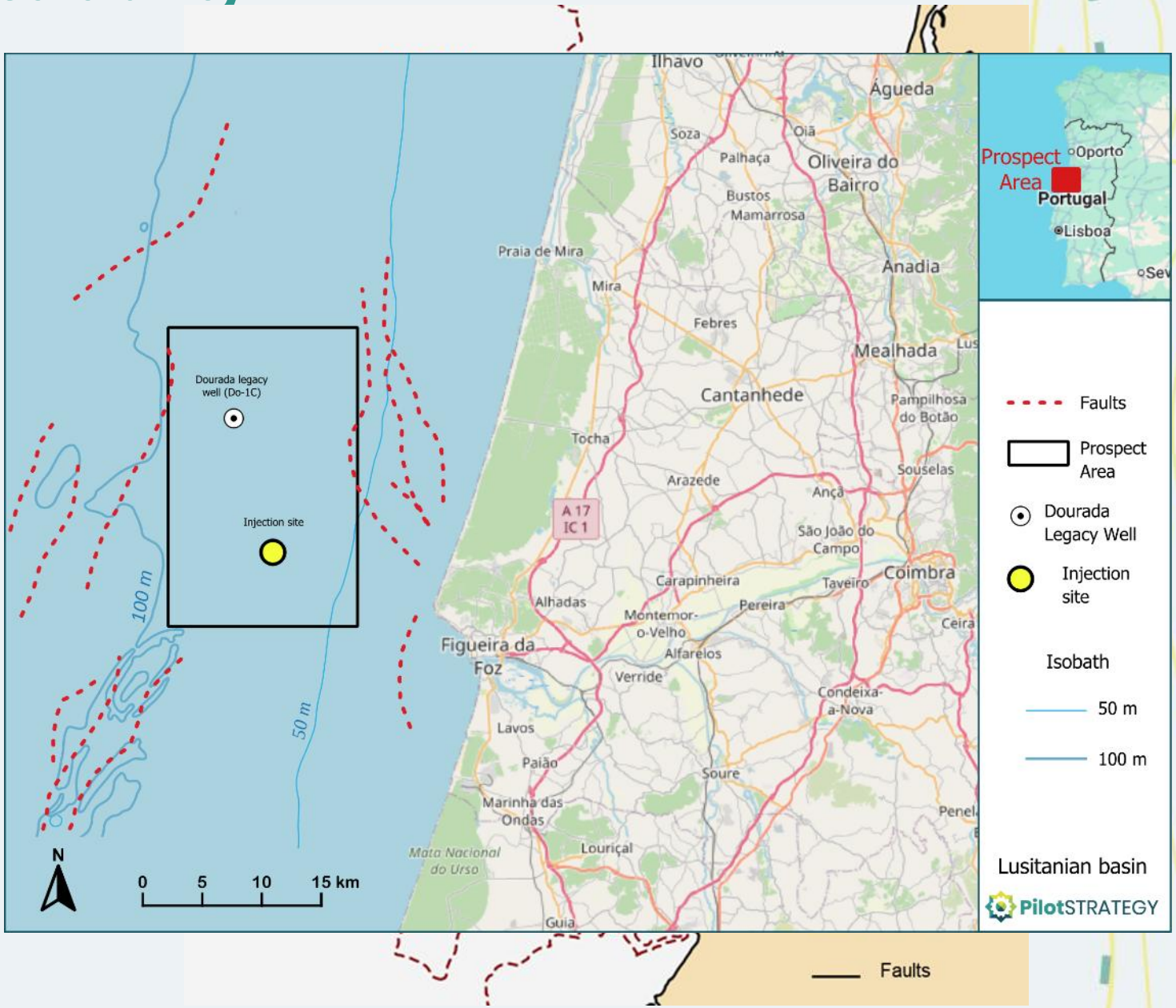
Scaling up CO_2 storage – pilot studies in regions with promising geological resources

- **5 years R&D Project** (2021-2026)
- **Research and Industrial partners** of 7 countries
- **Detailed characterization of CO_2 geological storage pilot sites** in selected areas of interest
- **Deep saline aquifers:** large capacity for storing CO_2
- **Support the development** of large-scale carbon capture and storage (CCS) in **Southern and Eastern Europe**
- **Pre-investment proposal** for the **3 pilots in France, Portugal and Spain**
- **Increase maturity of storage capacity** for Poland and Greece regions

Site location: offshore for scalability

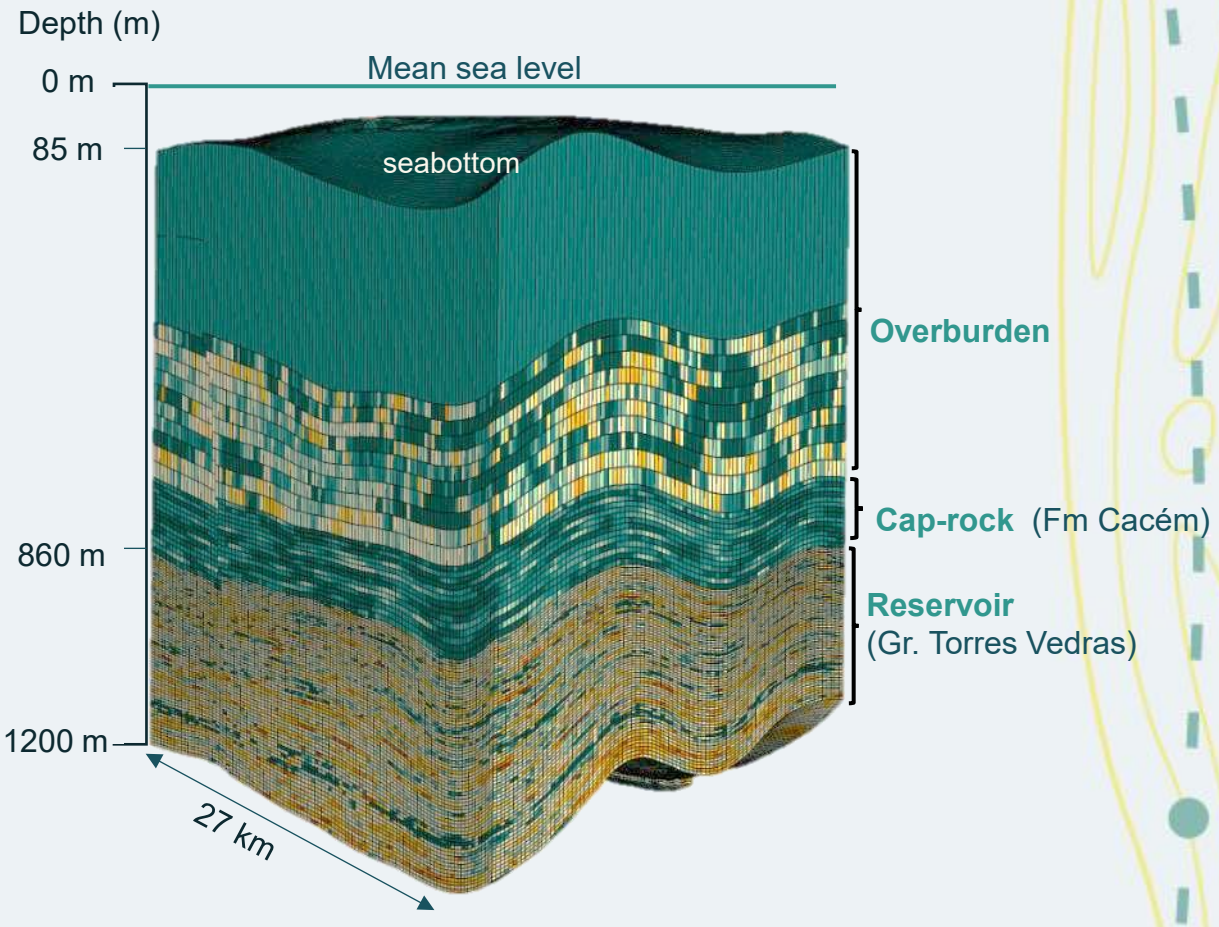
Offshore enables the scale Portugal needs for CO_2 storage to comply with decarbonization targets.

- **Excellent reservoir quality**
- **Low** active seismicity
- Conditions for **safe storage**
- Dynamic storage capacity > **93Mt CO_2**
- Around 20 km from **Figueira da Foz Port**



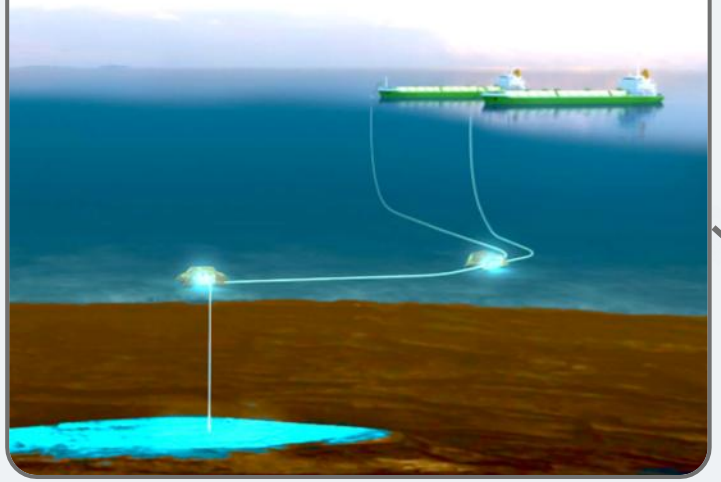
Storage complex

- **Water Column Depth (average):** 85m
- **Reservoir Top Depth (average):** 860m
- **Reservoir Bottom Depth (average):** 1200m
- **Reservoir Thickness (average):** 300m
- **Petrophysical Properties (average):**
  - **Reservoir:** ϕ = 22% | k = 229mD
  - **Seal:** ϕ = 7% | k = 0.04mD



Multimodal transport

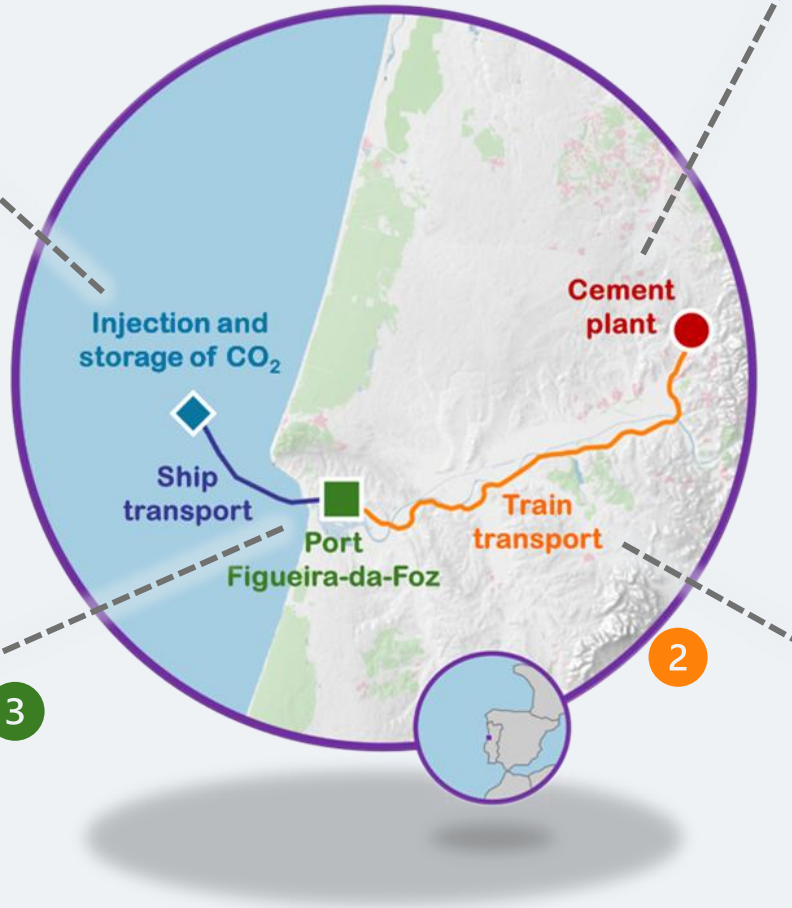
Transport and injection by ship



Injection period 12-15 months

<100 kton CO_2

4



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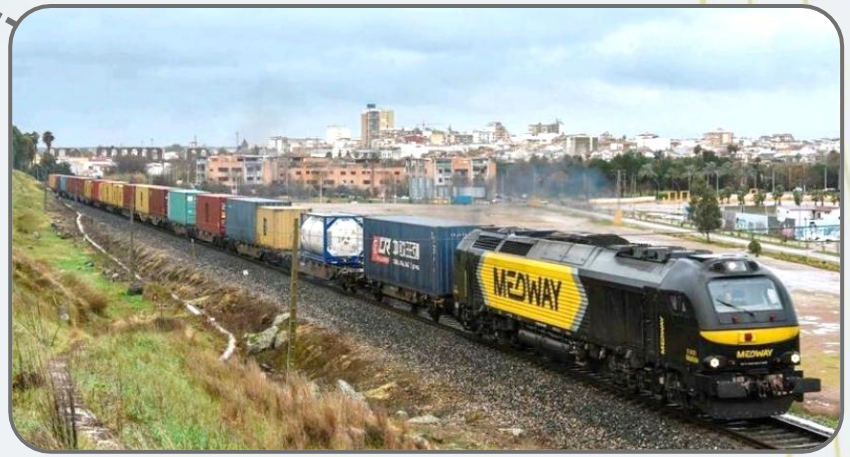
Liquefaction

Cryogenic containers, 23.5 ton CO_2 (P=15bar, T=-29°C)

2



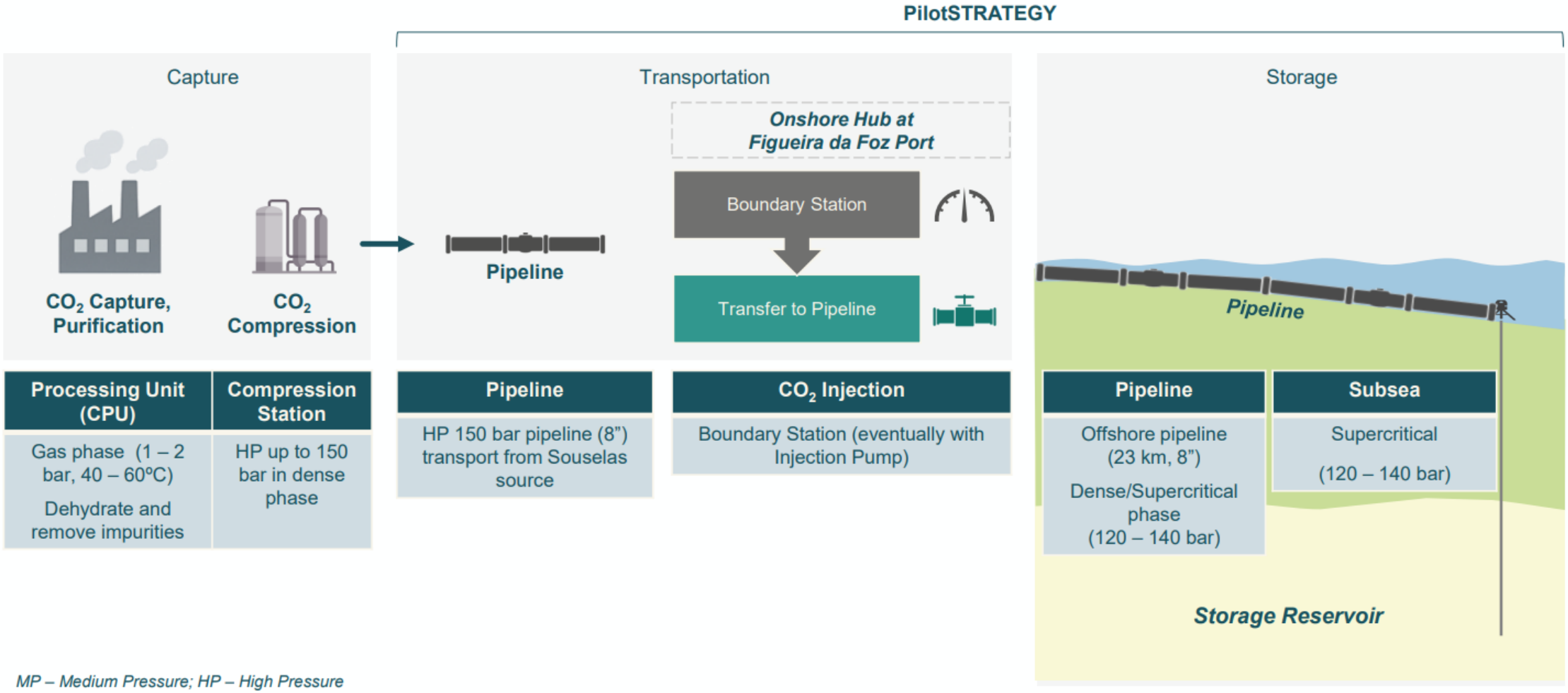
Train, ~650 ton CO_2

3

Port handling

Phase 2 – Commercial (Pipeline)

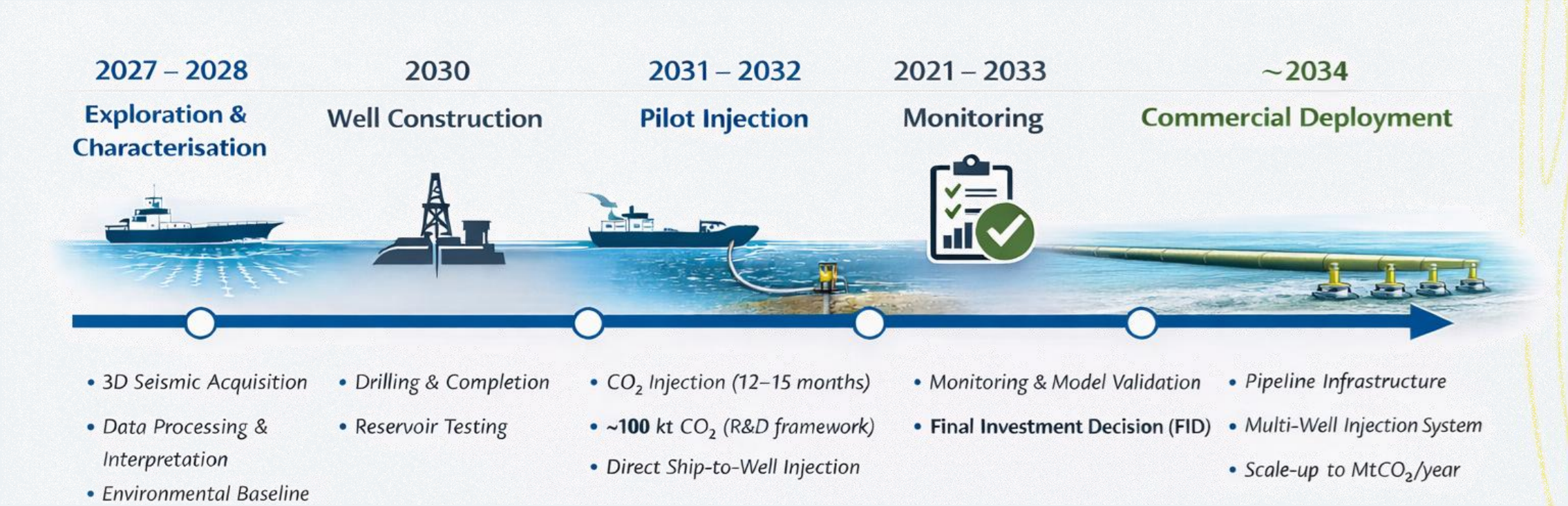
(not to scale)



Processing Unit (CPU)	Compression Station	Pipeline	CO_2 Injection
Gas phase (1 – 2 bar, 40 – 60ºC) Dehydrate and remove impurities	HP up to 150 bar in dense phase	HP 150 bar pipeline (8") transport from Souselas source	Boundary Station (eventually with Injection Pump)

MP – Medium Pressure; HP – High Pressure

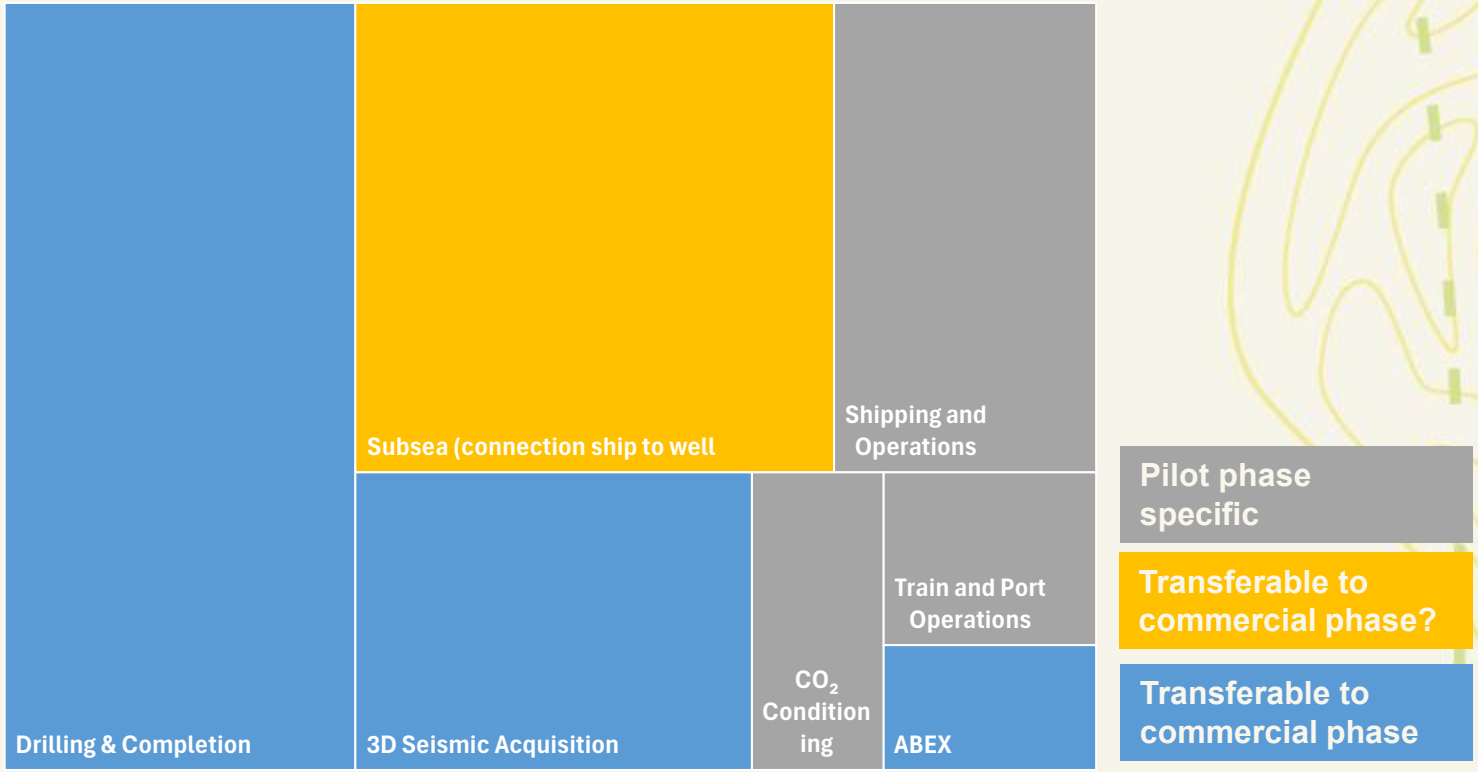
Project Timeline – from pilot to commercial



Clear decision gate for large-scale CCS deployment in Portugal

Cost structure

COMPONENT	SUB-TOTAL (M€)
CO_2 Conditioning	4.6
Train and Port Operations	4.3
Shipping and Operations	14.4
Subsea (connection ship to well)	26.3
Drilling & Completion	31.5
3D Seismic Acquisition	13.8
ABEX	3.1
Total	**98**



- Well and offshore infrastructure main components.
- Part of costs reusable in a commercial phase.
- **The pilot is not designed to be profitable — it is designed to reduce risk.**

Key takeaways

- Portugal has a technically credible candidate site for offshore CO_2 storage, with injectivity and storage capacity.
- **The pilot project is not a cost. It is a necessary condition for Portugal to achieve carbon neutrality and for the industry to have a decarbonization solution.**
- Pilot should start in 2027 to allow commercial project in 2034. Move forward immediately.
- Regulation problems do not prevent the implementation of the pilot, if configured as a research project.
- **The main constraints for future scale-up are now primarily institutional:**
  - **political support, maritime planning for CO_2 storage, subsurface governance, legal clarity and inter-authority coordination.**

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Acknowledgements

The PilotSTRATEGY project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101022664