CO2 REMOVE

research monitoring verification

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Partners

- European Commission, FP6
- Research organisations
  - TNO, GFZ, SSR, EPS, CMI, BGS, GEUS, IFP, SINTEF PR, BRGM, Imperial College, MEERIPAS, BGR, OGS, URS, ECN
- Industry
  - BP, Statoil, Total, Wintershall, Vattenfall, DNV, Quintessa, IEA, ExxonMobil (USA), ConocoPhillips (USA), Vector (New Zealand)
- TTC
  - CSIR (South Africa), La Plata Univ (Argentina), ISM (India),

The Perspective

- To enable geological storage as a tool in ETS (Emission Trading System)
- To ascertain the safety of the operations
  - Short and long term
  - Lateral and vertical
- To speed-up the deployment of CCS (Carbon Capture and Storage)
- To integrate all available expertise

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The Objectives

- Develop and test methods for base-line site evaluation
- New tools for monitoring storage and possible well and surface leakage
- New tools to predict long term behavior and risks
- A generic risk assessment methodology for different sites and time-scales
- Guidelines for best practice

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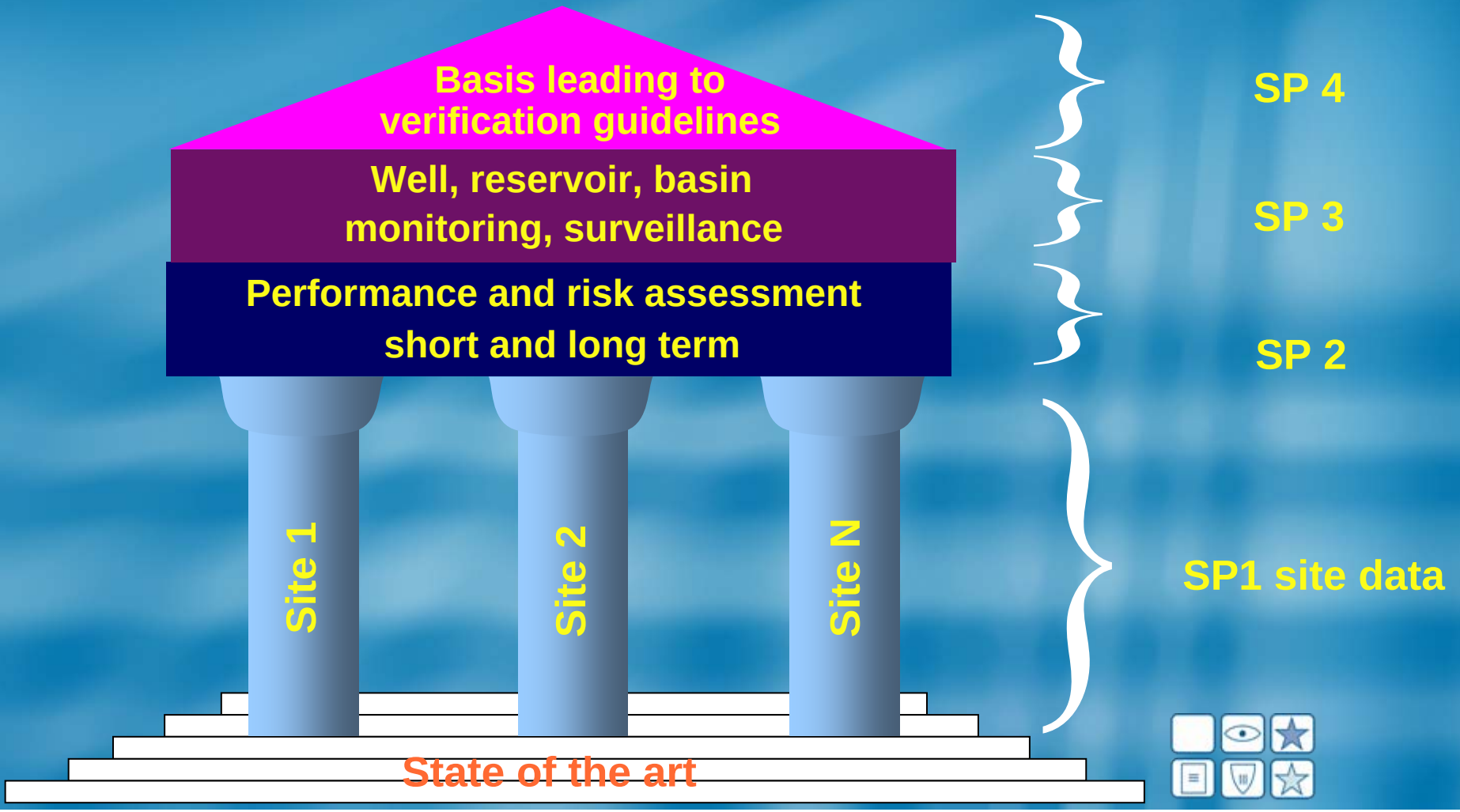
CO_2ReMoVe project structure



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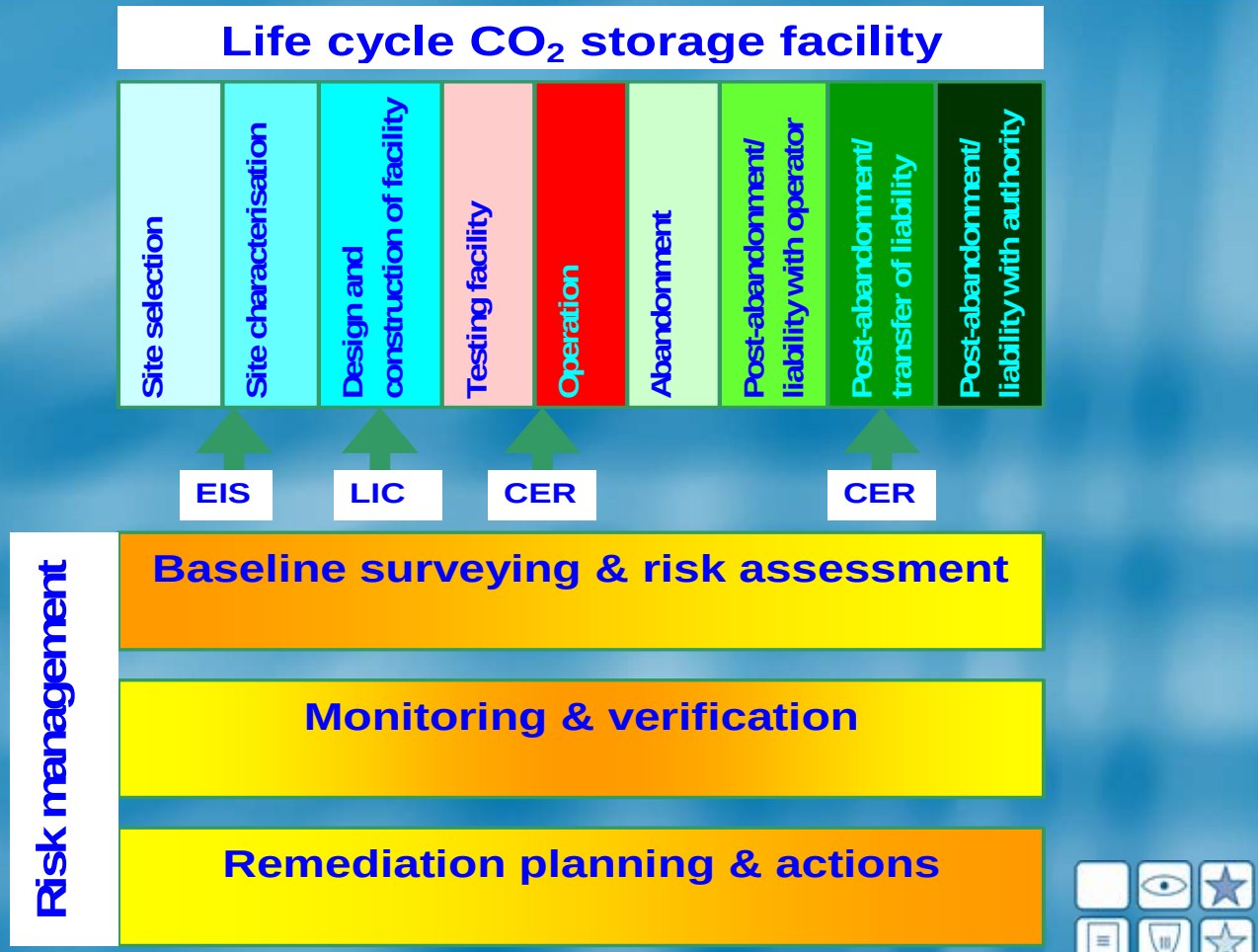
The CO2 storage lifecycle



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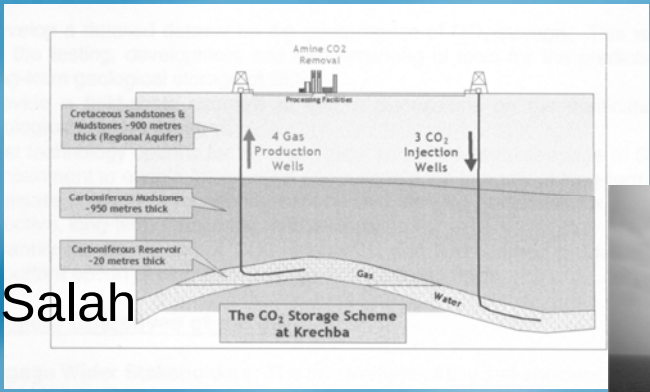
Key issue for a successful project: DATA



In Salah

Ketzin

Snohvit

Sleipner

Natural seepages

K12B

Kaniow

Weyburn

Tarnow

Any other new opportunity

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The timeframe

* CO2 injection, start
CO2 monitoring project name

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The way forward

- The industry is taking on big projects
- But a number of problems still need to be solved
  - Public acceptance
  - Affordable monitoring on the long term
  - Practical and realistic risk assessment
  - The cost aspect

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Some of the knowledge gaps

- mineralisation as result of CO2
- CO2/water solution effects
- Pressure/fracking
- Sealingness caprock
- Well integrity
- Movement along and across faults
- Regional groundwater movement

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Tools needed

- Multi-phase modeling for all dimensions and time scales (including overburden)
- Well modeling tools
- CO2 and material interactions studies
- Qualitative and quantitative risk assessment tools
- Decision support systems
- Cheap, efficient, real time monitoring tools
- NEN, CEN, ISO

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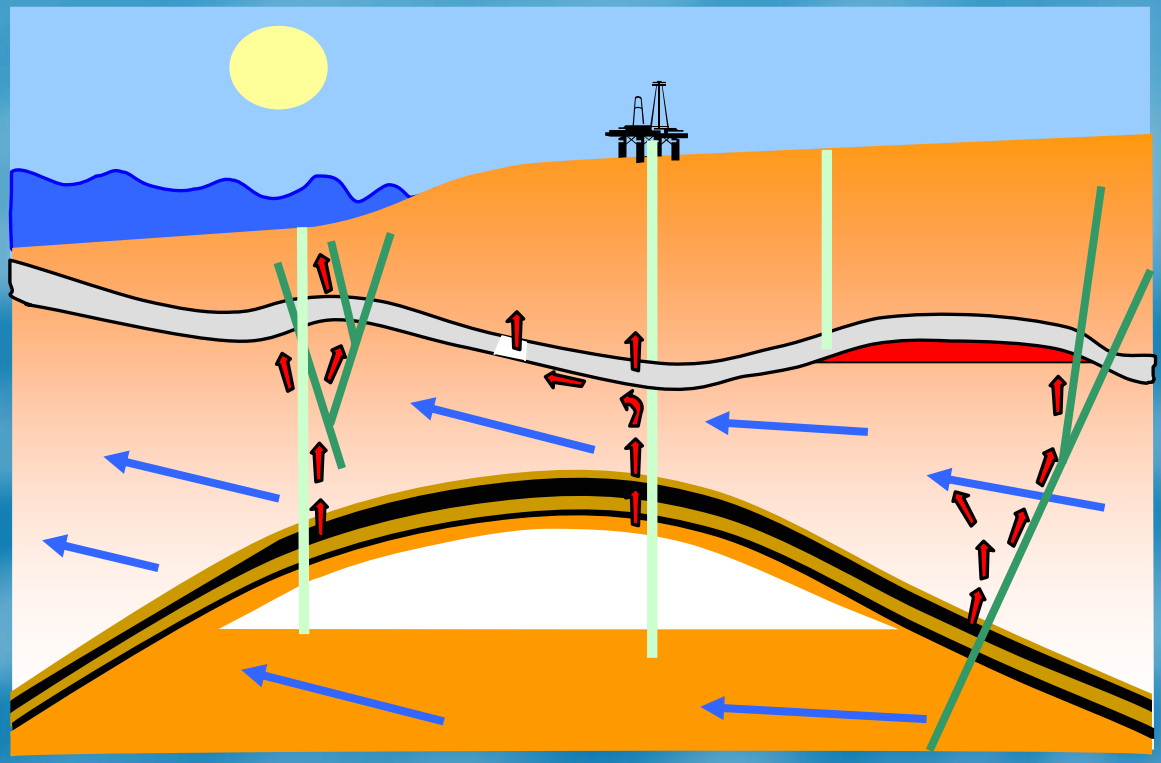
Possible leakage paths



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Years Ahead for Geological Storage

- **Industrial** application
- STREP type **research** projects
  - Covering research gaps
  - Developing new tools
  - Optimisation of CO2/EOR
- Mutual **data portals**
  - For testing of new tools and concepts
  - For exchange of experience

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