CURRENT DEVELOPMENTS IN GLOBAL CO_2 STORAGE

GLOBAL CCS INSTITUTE

CHRISTOPHER CONSOLI

SENIOR CONSULTANT

- **Consultancy** with experts across the full technical chain of CCS, including policy, law and regulation. We live and breathe CCS.

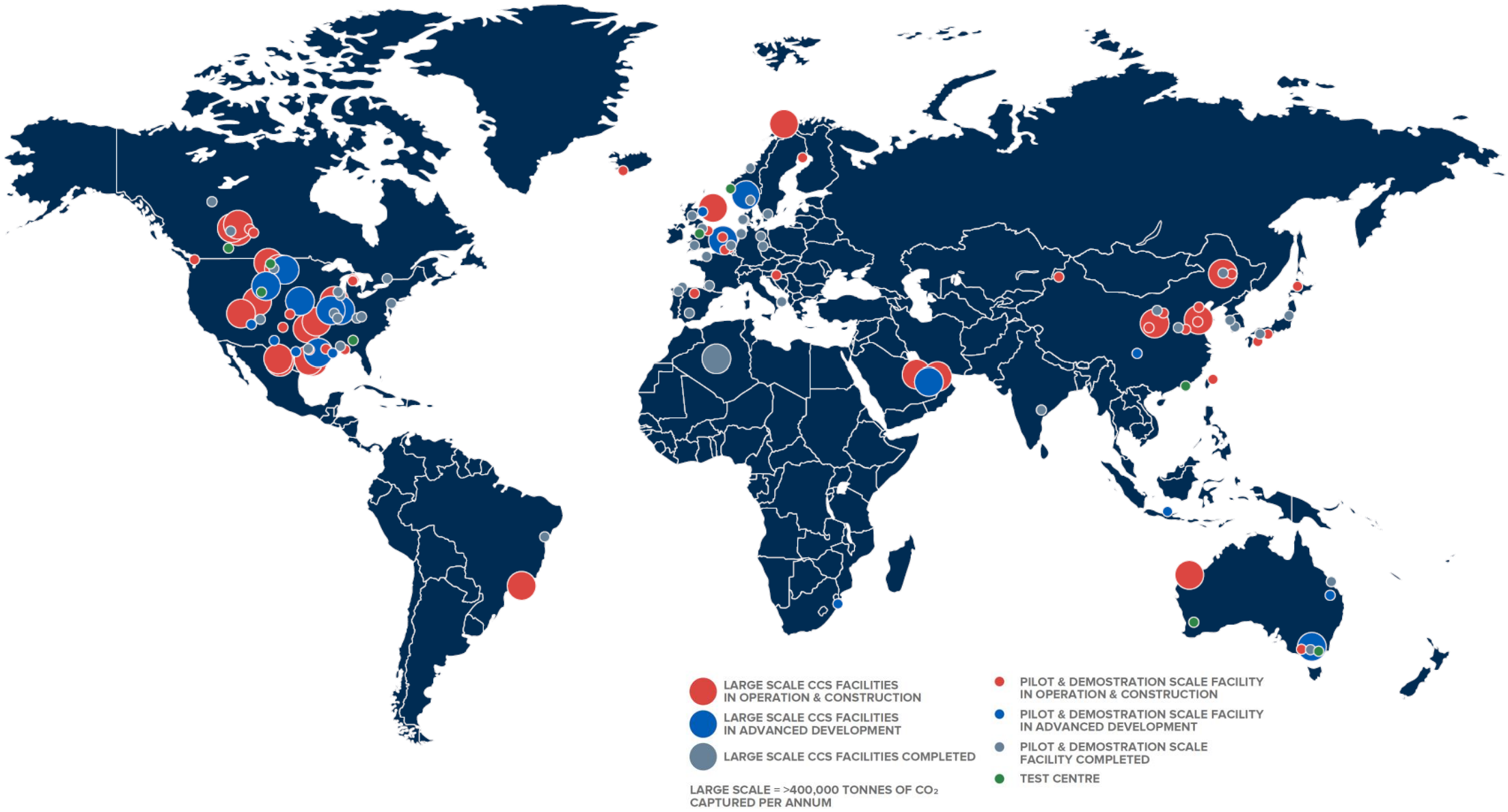
- **International think-tank** backed by governments, businesses and NGOs

- **Mission**: Accelerate the deployment of CCS globally

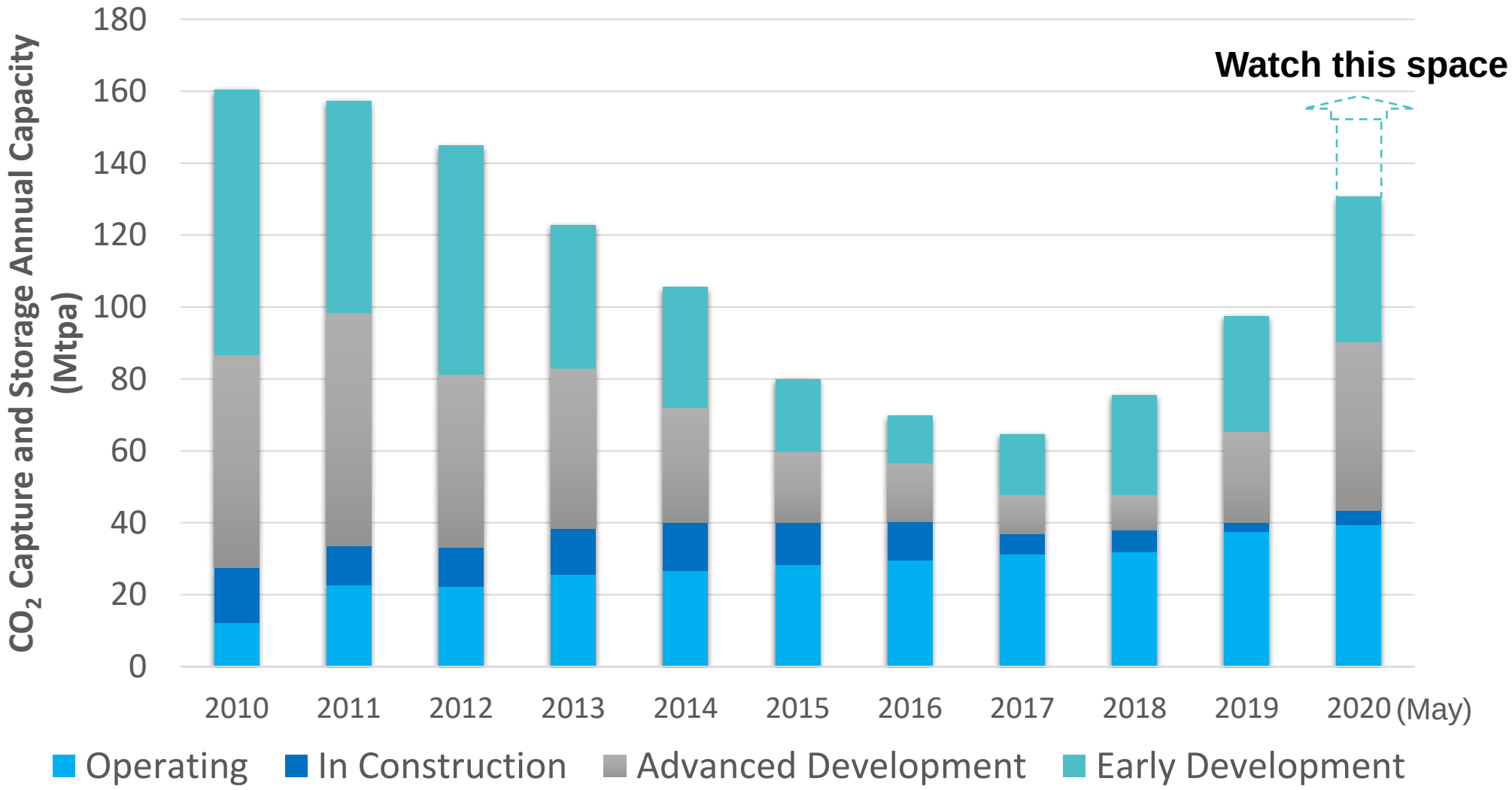
- **Member-owned** company: Melbourne (HQ), Washington DC, London, Brussels, Tokyo and Beijing

- **75 members** including governments, multi-national energy companies, technology providers, research organisations and NGOs

CURRENT CCS FACILITIES AROUND THE WORLD

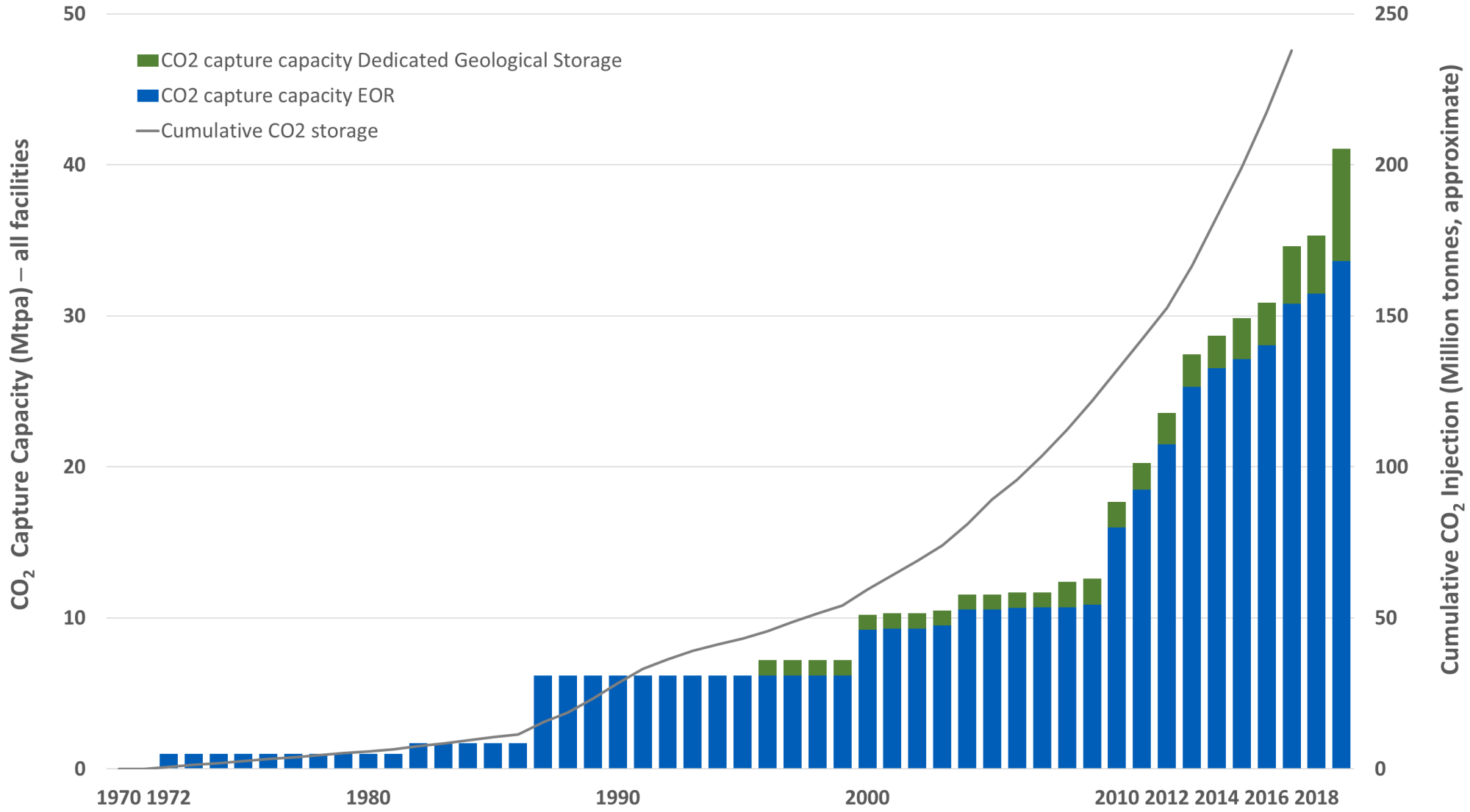


CCS PROJECT PIPELINE IS GROWING – BUT A LONG WAY TO GO



Source: GCCSI

CUMULATIVE CO_2 INJECTION



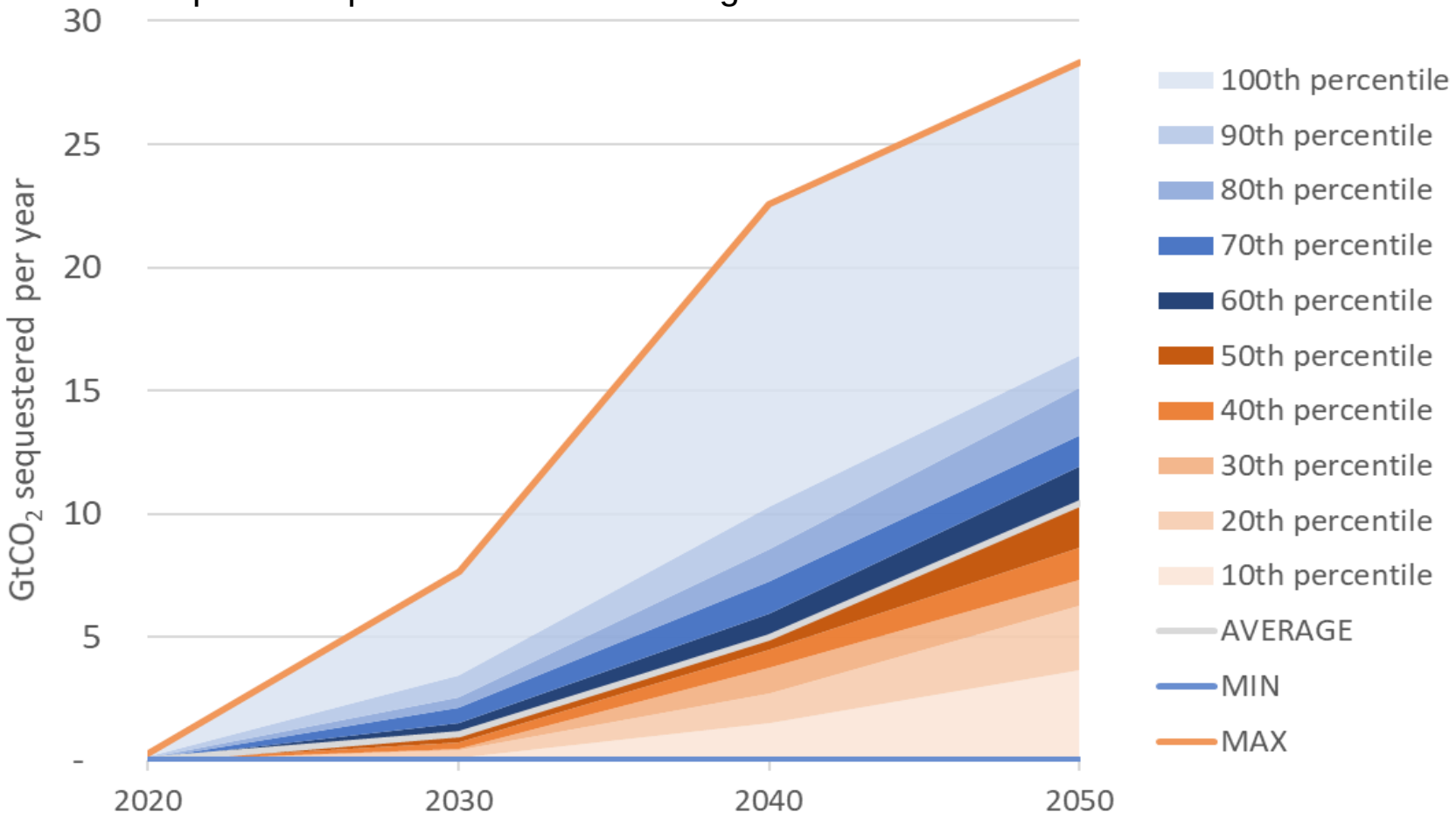
ROLE OF CCS IN 90 SCENARIOS REVIEWED IN IPCC 1.5 REPORT

Almost all scenarios required CCS

3 of 4 Illustrative Pathways required **348Gt to 1,218Gt CO_2 to be stored** this century

The 4th Illustrative Pathway required final energy demand to reduce by one third by 2050 compared to 2010

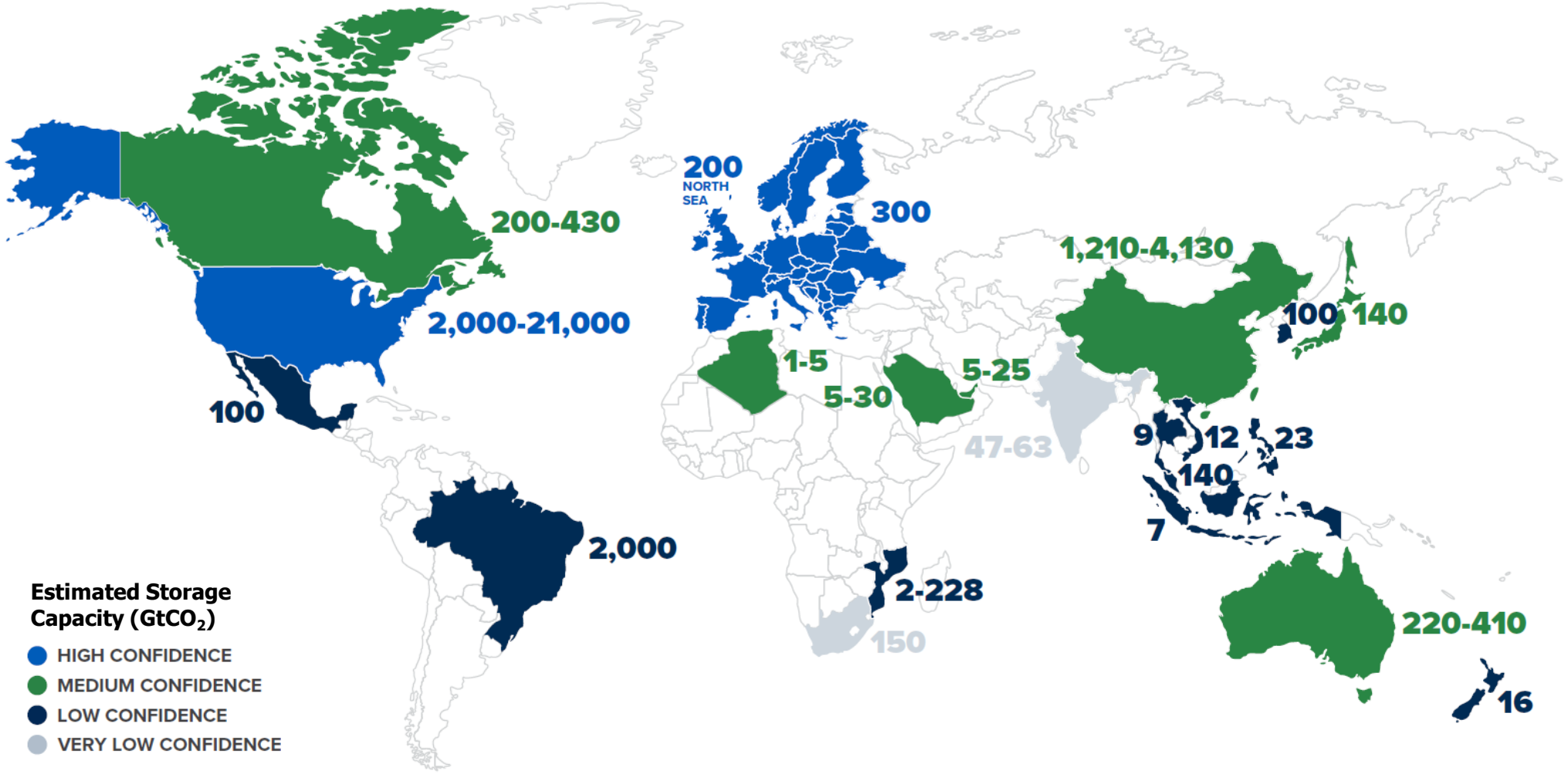
Annual CO_2 stored in the 90 1.5°C consistent scenarios reviewed in the IPCC Special Report on Global Warming of 1.5°C



Source: GCCSI analysis of IIASA 1.5C Scenario Explorer

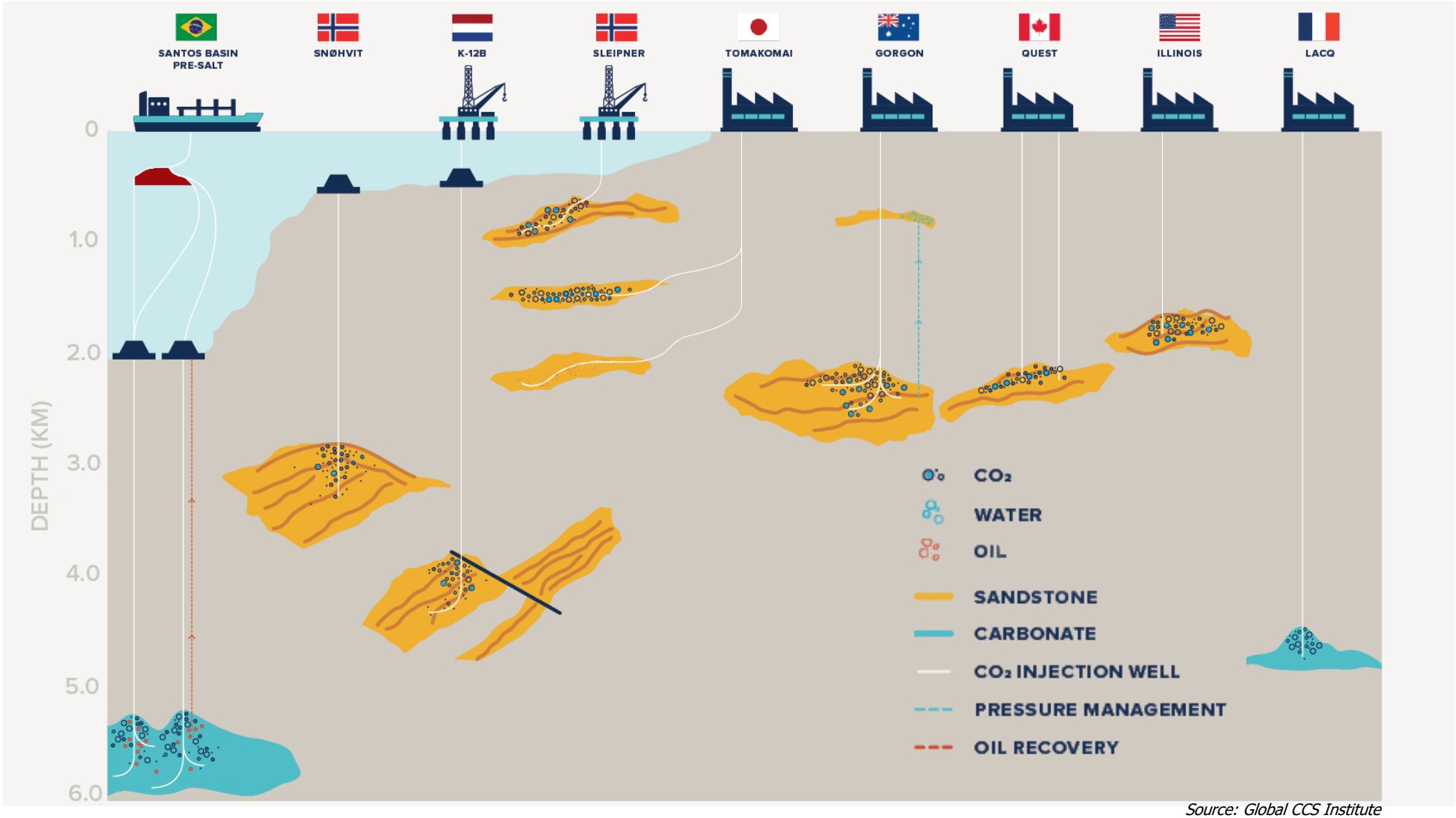
AMPLE GEOLOGICAL STORAGE RESOURCES

Conservative estimates of global storage capacity are several times larger than required this century under any scenario



CO_2 STORAGE EXPERIENCE

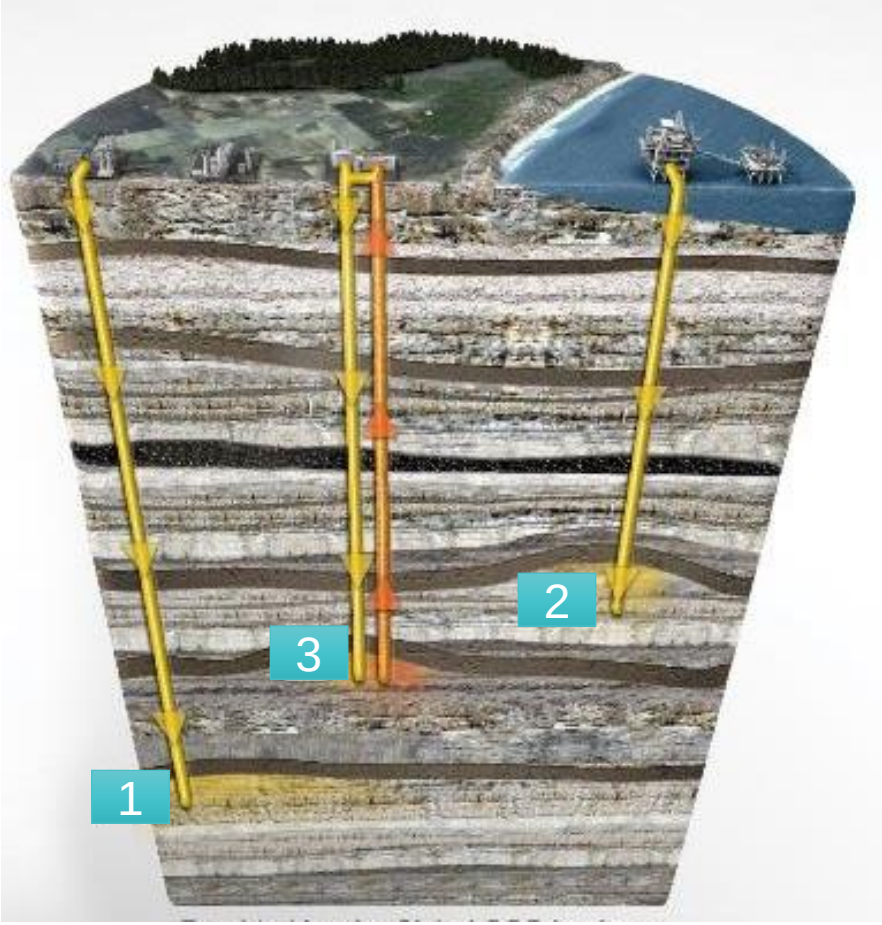
Different geology, geography, environments, injection design, regulations



Source: Global CCS Institute

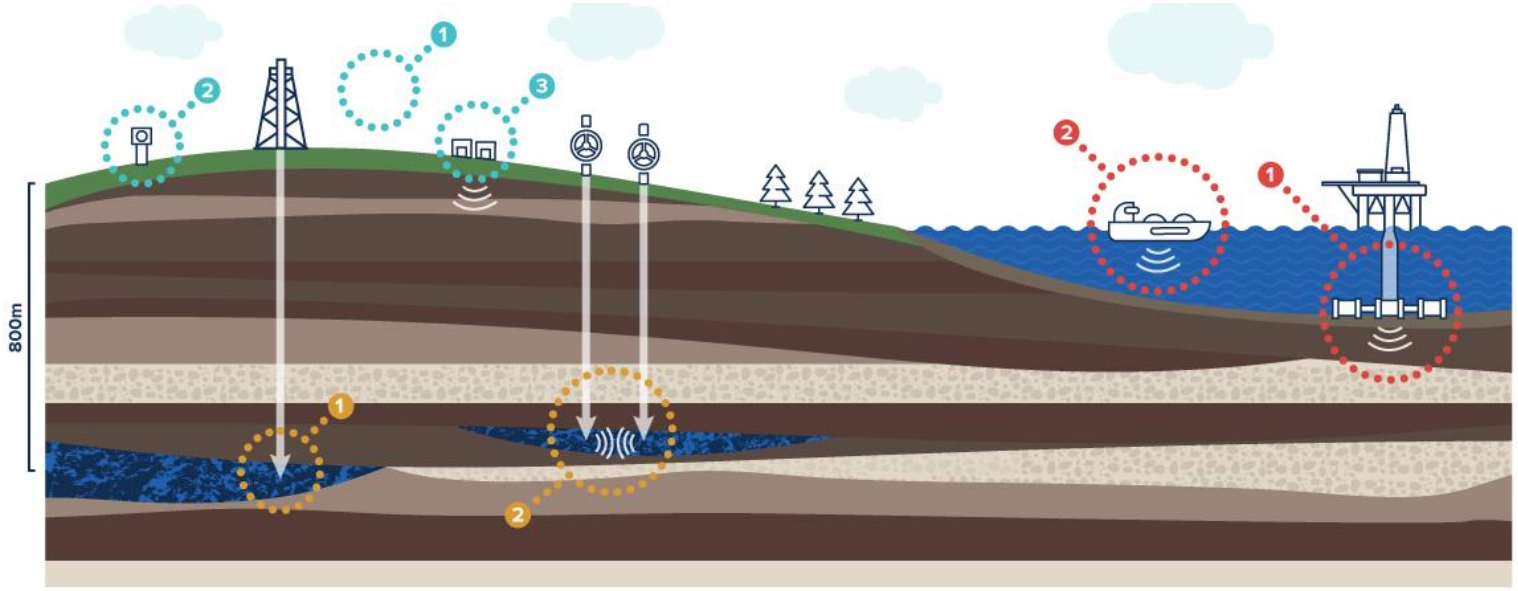
CO_2 STORAGE OPTIONS

The geology is well understood, common and globally distributed



1. **Deep saline formations:** volumetrically the largest and widely distributed
2. **Depleted oil and gas fields:** proven reservoir-seal pairs, infrastructure in place
3. **CO_2-Enhanced Oil Recovery**: provides commercial return on CO_2 injection, can be net negative CO_2

MONITORING TECHNOLOGIES



1 ATMOSPHERE
AIRBORNE EM
AIRBORNE SPECTRAL
SATELLITE INTERFEROMETRY

2 SURFACE
EDDY COVARIANCE
SURFACE GAS FLUX
SOIL GAS CONCENTRATIONS
GROUND WATER CHEMISTRY

2 SURFACE
2D/3D SURFACE SEISMIC
LAND EM/ERT
SURFACE GRAVIMETRY
TILTMETERS

1 SUB-SURFACE
DOWNHOLE FLUID CHEMISTRY
DOWNHOLE PRESSURE
DOWNHOLE TEMPERATURE
GEOPHYSICS LOGS

2 SUB-SURFACE
CROSS-HOLE EM
CROSS-HOLE ERT
CROSS-HOLE SEISMIC
MICROSEISMIC
VERTICAL SEISMIC PROFILING
WELL GRAVIMETRY

1 OFFSHORE
BOOMER/SPARKER PROFILING
BUBBLE STREAM DETECTION
MULTI-ECHO SOUNDINGS
SIDESCAN SONAR

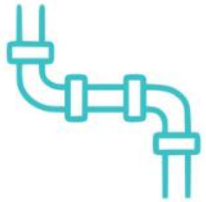
2 OFFSHORE
SEABOTTOM GAS SAMPLING
SEAWATER GEOCHEMISTRY
SEABOTTOM SEISMIC
SEABOTTOM EM

EM ELECTROMAGNETIC ERT ELECTRICAL RESISTANCE TOMOGRAPHY

- Extensive knowledge of the movement of gas and fluids in the subsurface
- **Extensive commercial experience in the technologies**
- Regulatory and industry-led checks
- **Low-likelihood of leakage to the atmosphere**

CCS IS VITAL TO OUR PARIS COMMITMENTS

IEA'S Sustainable Development Scenario (SDS)


	CAPTURE FACILITIES	PIPELINES	STORAGE SITES
TOTAL IN 2050	MORE THAN 2,000	200,000 KM	400
ANNUAL BUILD RATE TO 2050	70 - 100	5,200 - 7,200 KM	10 - 30

KEY POINTS

1. CCS has very wide applications across many industries
2. Mature and well understood technology
3. Deployment is required under any net zero emission scenario
4. Key enabling technology for clean energy future, especially in hard to decarbonise sectors where continued use of gas and other fossil fuels certain for several decades
5. CCS will be a cornerstone for the hydrogen and the necessary removal of CO_2 from the atmosphere (DACS and BECCS)

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