The CO₂ Storage Resource Catalogue

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Storage Resources and Classification
What is Geological storage, or Sequestration?

- The injection of CO\textsubscript{2} into geological strata with the aim of permanenly isolating the CO\textsubscript{2} from the atmosphere.

- Income normally linked to the production of clean products or the absence of emissions penalties.

Image courtesy of ZEP
What Is the Resource?

**Hydrocarbon Resource**
- “An accumulation of petroleum naturally occurring on or within the Earth’s crust”
- A subsurface rock formation containing an individual and separate natural accumulation of moveable hydrocarbons

**CO₂ Storage Resource**
- “The ability to accommodate and retain CO₂ in the subsurface”
- We are exploring for pressure space
- Space in the subsurface that can accommodate CO₂

Source: Shell
An Example
What is the UK storage resource?

- “The storage capacity is 78 Gt”

- Job done, let’s build a capture plant …
  - When are we ready to sign a take or pay contract?
  - What do I need to obtain shareholder, government or project finance?
  - How many wells do I need to drill?
  - What is my confidence of sustained injection?

Source: Exploration Taskforce
The reality is not so clear cut ...

- How do we compare regional evaluations with “bankable storage”?
- Regional evaluations use volumetric techniques – *rock volume x storage efficiency factor*
  - Very high level
  - Not linked to a project
- Project based evaluations
  - Hundreds of hours of work
  - Seismic surveys
  - Exploration and appraisal wells

How do we compare regional evaluations with “bankable storage”?

Regional evaluations use volumetric techniques – *rock volume x storage efficiency factor*

Project based evaluations
- Hundreds of hours of work
- Seismic surveys
- Exploration and appraisal wells
A classification system is needed

- Consistent manner to classify (not estimate) storage resources
  - Underpin investment decisions
  - Underpin policy decision
  - Track project spend
  - Communicate between customers (capture) and storage

- Project Based – or might say, injection mechanism based
The Storage Resource: SRMS

- Project based, built on PRMS

- Classification involves assigning the stage of project maturity

- Major Classification thresholds
  - Discovery
  - Commercial (and technical) maturity

- Use P10, P50, P90 volumes and constraints

- Expect resource range decrease with maturity

SPE classification of CO₂ storage resources

https://www.spe.org/industry/CO2-storage-resources-management-system.php
OGCI members supported SPE in development of SRMS

SRMS, SRMS guidelines, Global Storage Resource Catalogue

Flowchart for the classification of storage resources based on the SRMS guidelines and terminology
The storage resource catalogue
The OGCI CO₂ Storage Catalogue

Six year programme started in 2019

- Encouraging adoption of the SRMS
- Classifying all published CO₂ storage assessments through the SRMS

Objectives

- Open web resource
- Transparency to the CCS community, regulators, project financiers, the wider public
- Share information on resource maturity

Full report on ogci website

Large interest from the CCS community

https://www.ogci.com/co2-storage-resource-catalogue/
## Six year rolling programme classifying storage resource estimates

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**Countries Assessed**

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![Map showing countries included in the CSRC.](image)

*Figure 2-1 Map showing countries included in the CSRC.*
Countries assessed – summary of results so far

- 715 resource sites from 18 countries
- 12,958 Gt resource
- 96% is undiscovered Prospective
- 4.3% (551Gt) discovered sub-commercial Contingent
- 0.25% commercial Capacity – Australia, Canada, Norway and USA

Figure 1-1. Number of potential storage resource sites assessed in the CSRC, by country or region. N =715.
Breakdown covering all and only project related
Findings

Data gaps

• We would like more information to be shared and available on the Catalogue

SRMS is a project based system

• SRMS Resources should be associated to a project description
• The vast majority of the assessments are not
  - 90 Gt only amongst 13 000 Gt of resources are associated to projects
  - No indication on how the volumes could be stored
  - Within 50 or 1000 yrs? Injection only or brine extraction? How many injectors?
• We have implemented a filter to enable users to deselect resources not associated to projects
• We believe this remains a major weakness on current understanding of CO$_2$ storage global resources
Ambitions

Becoming an international standard
• With improvements from users feedback, new versions of the SRMS, …

Transitioning towards a self-sustained Catalogue
• uploading SRMS-compliant resources to the Catalogue

Promoting project-base resource assessments to Atlas generators
• We believe CCS industry needs clarity on how resources will be delivered
  - What timeframe
  - Need of brine extraction? What injector density?
  - What impacts (level of pressure increase, CO$_2$ migration, …)
➢ And we welcome this workshop to have this discussion
Thank you
CO₂ Storage Resource Catalogue

Source: OGCI
https://www.ogci.com/co2-storage-resource-catalogue/