

Practical
Treatment of Liability
in the UK

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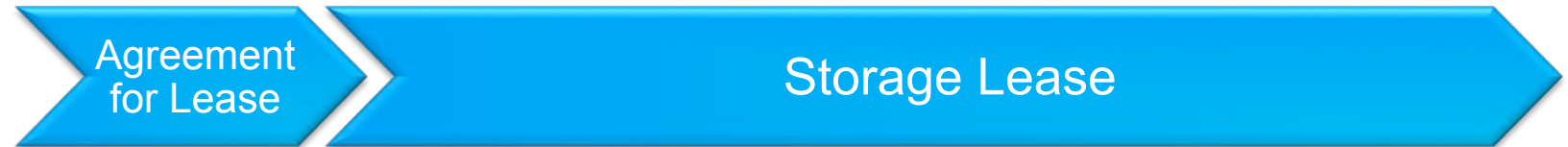
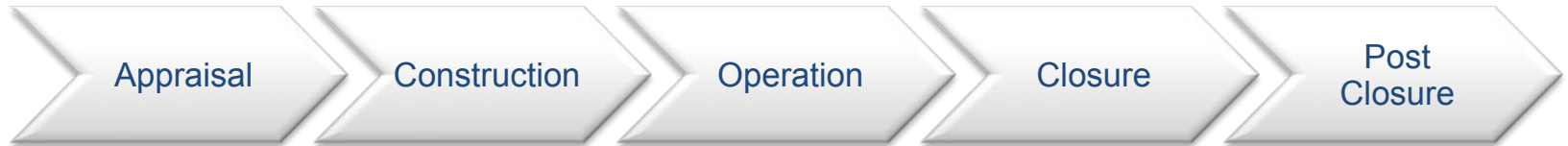


UK transposition of Directive

- ❑ **Licensing and permitting requirements** were transposed by “The Storage of Carbon Dioxide (Licensing etc.) Regulations 2010”
- ❑ **Inspection requirements** were transposed by “The Storage of Carbon Dioxide (Inspections etc.) Regulations 2012”
- ❑ **The transfer of responsibility** from the site operator to the State were transposed by “The Storage of Carbon Dioxide (Termination of Licences) Regulations 2011”
- ❑ **Third party access requirements** were transposed by “The Storage of Carbon Dioxide (Access to Infrastructure) Regulations 2011”
- ❑ Wide series of amendments to existing legislation were necessary to implement the Directive and harmonise the regulation of CCS activities with pre-existing legislation.



The UK Licensing/Leasing Regime



Existing UK offshore regime and practice

Financial Security

Based on an **Oil Pollution Emergency Plan** which contains worst case scenario information, incident response actions and costs should such a scenario occur, including loss of well containment/well blow out and compensation.

Any combination of:

- credit/financial strength rating of the operator or co-venturer;
- insurance; and
- parent company guarantee/affiliate undertaking.

Capped Liability

Liability of companies that cause offshore oil pollution damage is strictly restricted. The **Oil Pollution Prevention and Control Regulations** rule the extent of statutory liability for any operator offense and the industry **Offshore Pollution Liability (OPOL) Agreement** caps civil liability for any damage.

The max liability of an operator against a claim of pollution damage is limited to **US\$125 million** per incident, subject to some provisos.

Regulation

UK has an established decommissioning regime for the Decommissioning of Offshore Oil and Gas Installations and Pipelines under the **Petroleum Act 1998**.

Existing HSE legislation is to be used to regulate the safety of the CCS chain including:

- Health and Safety at Work etc. Act 1974 (**HSWA**)
- Pipelines Safety Regulations 1996 (**PSR**)
- Control of Major Accident Hazards Regulations 1999 (**COMAH**)
- Offshore Installations (Safety Case) Regulations 1995 (**OSCR**)

Insurance Market

For many of the familiar operational risks, **risk mitigation, risk transfer options, and insurance solutions** already exist and are known to both the insurance and oil and gas industries.

DECC Commercialisation Competition Tender

Bidder Qualifying Financial Assessment Criteria

Experience

- Operational experience of offshore oil or gas facilities with at least **£500 million value**; and
- Owning, or having a controlling interest in, a business with an annual turnover of not less than **£750 million** in the UK operating in a regulated infrastructure industry.

Credit Test

A minimum **turnover threshold and credit rating**:

- Credit rating of at least **BB/Ba2/BB** increasing to at least **BBB-/Baa3/BBB-** for Project Contract award;

Or

- Evidence of ability to raise at least **£250 million entirely in equity or debt** from unrelated parties based on existing business activities.

Financial Test

Qualifying Turnover Threshold:

- Threshold of **£750 million** for the average turnover of the last three available financial years' accounts.
- Must not be comprised solely of a bank(s) or financial institution(s).

Guarantees

- **Parent Company Guarantee** for the Developer's obligations.
- **Payment and performance guarantee** required.
- **A joint and several guarantee** by the ultimate parent company of each of the Consortium Members.
- Developer required to **procure performance bonds** issued by a financial institution or an insurance company if the credit rating of a guarantor falls below a certain level.

Quantification of risk

Summary of estimated leakage probability, rate and duration for different leakage pathways (AGR and Senior CCS Solutions, 2012)

Pathways	Scenarios	Probability	Potential Leakage Rates (tonne/day)	Duration (Years)	Potential amount of CO ₂ (tonne)
Operational Well ^a	Low Level Leakage Scenario	10 ⁻⁴ - 10 ⁻³	0.1 - 10	0.5 – 20	18 - 73000
	Worst Case Scenario	10 ⁻⁴ - 10 ⁻⁵	5000	0.25 – 0.5 (with remediation measures)	0.45m – 0.9m
Abandoned Well ^b	Low Level Leakage Scenario	1.2x10 ⁻³ - 5 x 10 ⁻³	0.6 - 6	1 - 100	220 - 220000
	Worst Case Scenario	n/a	1000	0.25 – 0.5*	90 - 180000
Migration through Caprock		Negligible	Very low	100 - 1000	Very Low
Leakage via Fault	Vertical Migration - Low Flux	Site specific	1 - 5	1 - 100	0 - 1.8m (100 yrs)
	Vertical Migration - Moderate Flux	Site specific	50 - 250	1 – 5*	0.018 – 0.46m
	High Flux Migration	Site specific	1500	1 – 5*	0.55 – 2.7m

a: Assuming a single store with 5 injection wells, a 20 years injection period and 200 million tonnes of CO₂ stored in total

b: Assuming a single store with 6 abandoned wells, 200 million tonnes of CO₂ stored in total and a probability of leakage over 100 years



DECC Commercialisation Competition Tender

Total liability of permit site holder comprising the Financial Security:

Decommissioning

- **Full cost of decommissioning** carried out in accordance with the Guidance Notes under the Petroleum Act 1998.

Monitoring

- **Cost of monitoring of the storage site based on a 20 year period between closure of the store and handover** to the competent authority. (Developer sets out assumptions taking into account the characteristics of the intended storage site.)

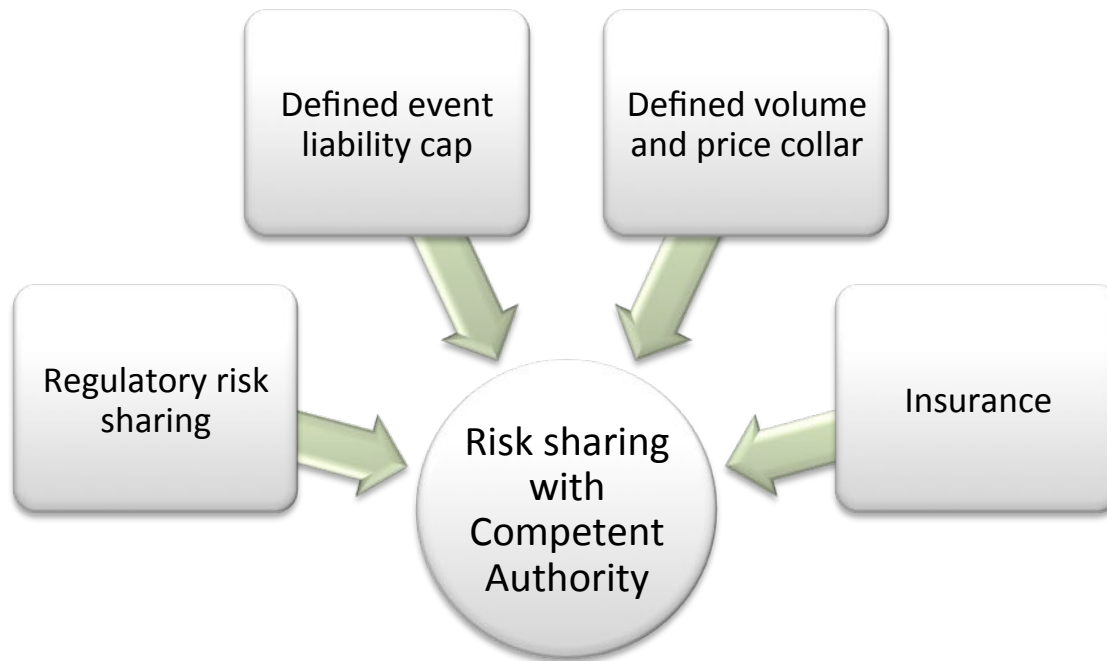
Leakage Liability

- **Contingent liabilities limited to the cost of a well bore failure requiring remediation** plus the value of a volume of carbon dioxide assumed to leak to the atmosphere half way through the project for a period of 2 years at 1% of the planned average annual rate of injection over the lifetime of the project.
- The CO₂ value calculated using a pre-defined carbon price trajectory.

Transfer Payment

- The Financial Mechanism transfer payment to be a **cash payment to match the anticipated cost of monitoring the storage site for a period of 30 years after handover** to the competent authority.

Options for managing CO₂ storage liability in the financial security



Example solutions for addressing CO₂ storage liability :

- ❑ Risk sharing if certainty on application of CCS regulations cannot be achieved and affordability and value-for-money can be demonstrated.
- ❑ Defined event liability cap similar to UK competition or risk-weighted based on probability and scale of event with fixed price trajectory
- ❑ Defined volume and price collar based on price setting mechanisms such as a moving average of previous few years' EUA price
- ❑ New insurance product for carbon allowance reimbursement (CARI) requires capping of leakage liability



Insurability with capping and price floor

- ❑ 'CO₂ Leakage Risk' is the risk the operator faces of having to surrender EUAs as a consequence of CO₂ leakage from the storage complex to atmosphere.
- ❑ By linking the liability to the unknown future price of EUAs under the ETS, the EU CCS Directive does not cap the size of this liability for operators.
- ❑ Neither insurers nor storage operators are able to bear unlimited liabilities, so risk sharing with government is required.
- ❑ An innovative way of extending possible 'injection phase' insurance products exists such that, under tightly defined criteria, they would provide cover for at least a subset of the total post closure liability.
- ❑ The insured is likely to need to declare the volume of stored CO₂ to be insured up front and the insurer and insured would need to agree the EUA price at which the policy would indemnify the insured following a leakage event, based on a 'ceiling and floor' price or on a moving average based on the previous few years' price.



Thank you!



Quantification of risk

Illustrative diagram of the lifecycle and risk of leakage for a CO₂ storage project in the EU regulatory context



Operation	Preparation	Injection	Closure	Post closure	
Phase defined by GD1 of EU CCS Directive	1. Assessment of storage capacity 2. Characterisation on and assessment of storage complex 3. Development	4. Operations		5. Post-closure / Pre-transfer 6. Post-transfer	
Estimated Duration	Phase 1: 0.5 - 2 years Phase 2: 2 - 11 years Phase 3: 1-3 years	Phase 4: 5 – 50 years		Phase 5: uncertain Phase 6: perpetual (long-term stewardship of site by member states)	
Liability	n/a	Operators*	Operators*	Operators*	Competent Authority
Actions by operators during each phase	-site screening; and ranking; -simulation; -risk assessment - apply for CO ₂ storage permit (need to comply with ALL CCS Directive requirements) - monitoring, reporting and corrective plan	- monitoring - update models - risk assessment - corrective plan	- target monitoring - Update models - risk Assessment - corrective plan - decommission	- decrease monitoring - evaluate long term monitoring and corrective plan - transfer responsibility to Competent Authority (CA) when evidences indicate CO ₂ will be completely and permanently stored	

* Member state of the project will be liable for CO₂ storage obligations in an event of operator default.

KEY FEATURES OF
CONCEPTUAL 'CARBON
ALLOWANCE REIMBURSEMENT
INSURANCE' (CARI) POLICY
TO INDEMNIFY THE INSURED
AGAINST THE COST OF
SURRENDERING EUAS
FOLLOWING A CO₂ LEAKAGE
TO THE ATMOSPHERE.

Term: The CARI policy would be an annually renewable insurance policy.

Phase of CCS lifecycle: The CARI policy would apply to the injection phase in the first instance.

Proximate causes covered: Leakage events resulting from damage to operational wells, abandoned wells and the caprock seal over the well bores. In the insurance industry, this would best be termed 'all risks'. By modifying other environmental insurance policies, it might be possible to cover gradual seepage through faults and fractures.

Exclusions:

- Defects in design, plan, specification, materials or workmanship
- Normal wear and tear, gradual deterioration or normal corrosion
- Earthquake (can be included, but could give rise to aggregation risk given the geographic focus of this market)
- Normal settling, normal shrinkage or normal expansion in land and/or caprock

Limit of Liability: Precise limit TBC but the insured would need to declare the volume of stored CO₂ to be insured up front and the insurer and insured would need to agree the EUA price at which the policy would indemnify the insured following a leakage event. This could be based on a 'ceiling and floor' (or 'cap and collar') price or on a moving average based on the previous few years' price. This approach is analogous to how future electricity prices are dealt with in other insurance policies.

Deductibles: A monetary deductible would need to be agreed as there would be an expectation that the insured would retain a primary portion of the risk.