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#9 FINANCING CARBON MANAGEMENT: CHALLENGES AND SOLUTIONS

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MODERATOR

Stijn Santen

BUSINESS DEVELOPMENT AND ADVOCACY LEADER

EBN

Stijn Santen studied chemical engineering and has worked for 18 years in Shell. He was the founder of the first successful CCU projects; Shell-Omya (1998) and Shell-OCAP (2005).

In 2019 he joined EBN to develop the CCS project Aramis. Since 2023 he is also the chairman of the CCS projects network of ZEP and organizes capacity building for governments and business development with industrial partners.

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External Financing of CCS projects; why and how?

Stijn Santen (EBN)
15 April 2026
Longship knowledge sharing summit, Sandefjord, Norway

Workshop 9 “Financing carbon management; challenges and opportunities”

Agenda

1) **EBN roles and responsibilities**
2) **Why and how to mobilize more private capital**
3) **Why and how to use private capital for CCS projects**
4) **Choices and consequences of financing methods and their quantitative impact**
5) **Economy of scale and project return**
6) **Mitigating risks and EU policies**
7) **The ZEP EU financing working group**
8) **My recommendations**

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15 April 2026
Workshop 9
Longship knowledge sharing summit
Sandefjord, Norway

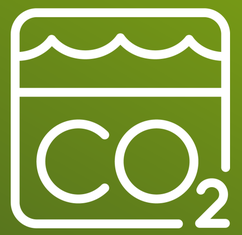
Strategic pillars of EBN

Natural gas projects
(Investor, trader, managing gas storage)

EBN (staff ca. 300) operates always in JV's

Geothermal projects
(developer and investor)

Turnover 2024: 3,57 billion euro
Nett result 2024: 1,52 billion euro



CO_2-transport and storage
(developer, investor and sometimes operator)

EBN engages/participates in 9 storage cooperations

Energy System analysis
(advisor, communicator)

Why and how to unleash more private capital for CCS investments in the EU?

1) **Very much capital is needed for the energy transition/ICM, defense, infrastructure etc.**
2) **Most governments are restricted in spending much more on subsidies and absorbing risks**
3) **13.500 billion euro on private bank accounts to a large extent dormant with only 36 % of private capital invested**
4) **More investments by citizens/households (79 % like in the USA) would yield 350 billion euro/year extra for investments in Europe generating Europe's innovation flywheel and geopolitical resilience**
- **5) Pension funds and public investment funds (long term investors) get mandate to invest in ICM/CCS**

Mario Draghi and Peter Wennink

Stijn Santen (EBN)
15 April 2026
Longship knowledge sharing summit
Sandefjord, Norway

Why and how to unleash more private capital for a CCS project?

- **- Private companies need to compete and justify their CCS investments against decarbonization alternatives and core business activities in return on capital and risk profile**
- **- Many private companies have ICM obligations like the NZIA**

- **1) Debt financing can potentially decrease capital costs (WACC) and reduce the amount of required equity capital for the project developer in 2 ways**
  - **a) non-recourse project financing by banks requiring a separate legal entity e.g. SPV**
  - **b) recourse financing via the balance sheet of the project developer e.g. via issuing bonds**
- **2) Equity financing by long term investors reduce the amount of required capital for the project developer (requiring a separate legal entity e.g. SPV) and can be done in combination with project financing**
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International Energy Agency

CCS project investments
Period 2023-2025
USD 50 billion government capital
USD 15 billion commercial debt

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Choices and consequences of financing methods

- **A) Project financing by banks requiring a separate legal entity e.g. SPV or/and in combination with equity financing**

- **ICM will be separate from the core business**
- **Maintain company financial ratio's like debt/EBITDA and debt/equity**
- **Option to sell the CCS project as a separate business later on**
- **Lower financing costs (WACC)**
- **Increased organizational complexity**

B) Issuing bonds (financing via the balance sheet of the project developer)

- **Applicable for large investment grade (listed) companies**
- **Will do multiple CCS projects and become a leader in CCS**
- **CCS is an integral part of the business and product offering**
- **Has the lowest financing costs (WACC)**
- **Low organizational complexity**

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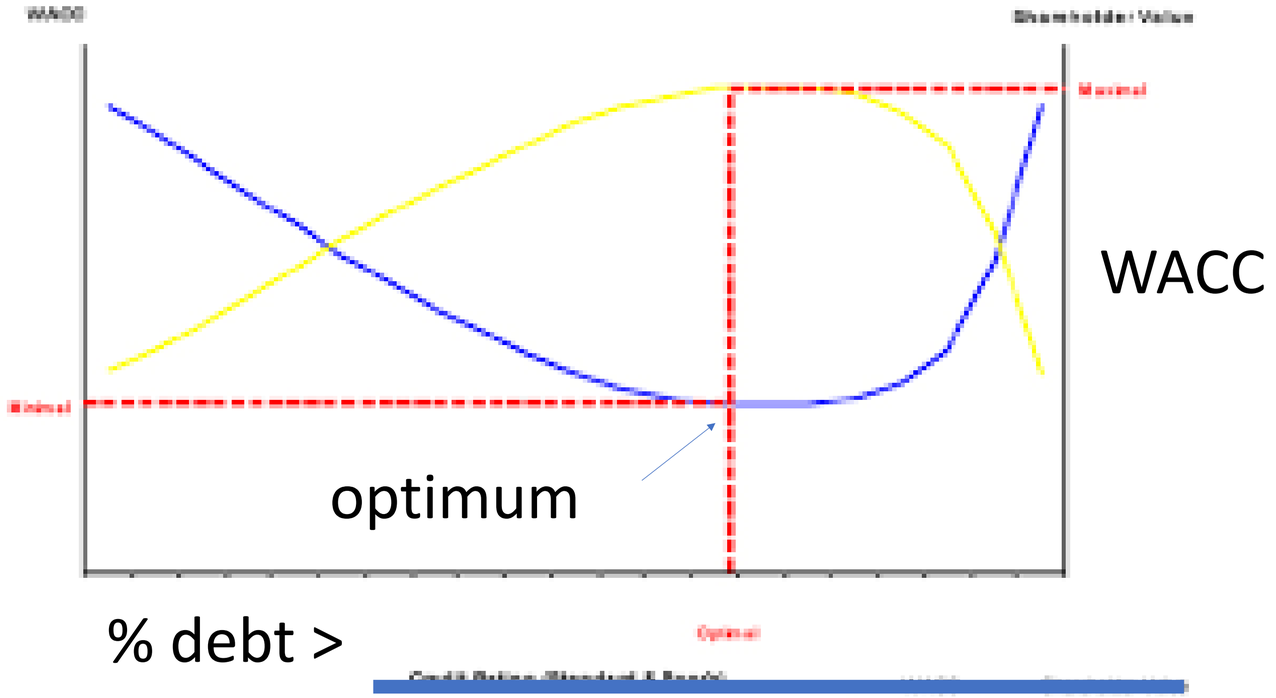
Sandefjord, Norway

Quantitative impact of debt financing on capital cost (WACC)

- **Requirements:**

- **ROE >> interest rate debt**
- **Acceptable tariffs in CCS**
- **Contracts that mitigate risks and ensure stable cashflow**
- **Investment grade and experienced project developers**



Example optimum :

- **70 % debt financing at 5 % financing cost/interest rate**
- **30 % equity at 10 % ROE**
- **Resulting WACC at 6,5 %**

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Porthos onshore pipeline (x MTA CO2 capacity)
What is x?

Positive economy of scale versus timing and project returns (case EBN)

- **Doubling pipeline diameter (and costs) leads to 4 times the CO2 throughput capacity**
- **CAPEX investment costs are dominant in the final CO2 reduction costs of euro/ton CO2**
- **CO2 transport and storage projects take at least 5 years, thus a long period of negative cashflow before income starts and a much longer period before it becomes cash positive**
- **EBN has a AAA credit rating and can therefore achieve a low WACC / capital cost enabling large investments with a long lead time and thus can benefit from economy of scale**
- **Combining large pipelines with multiple reservoirs and multiple industrial customers enable even more economy of scale and risk diversification**

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Mitigating risks and EU policies for ICM deployment

1) Containment in storage/subsurface risks >>>>>> EU wide template for insurance for all reservoirs

Currently by storage operator and/or government

2) Revenue risk due to EU-ETS volatility >>>>>>>>> CFD via EU decarbonization bank

- **3) Product price/demand risk >>>>>>>>> CBAM, green purchasing, lead markets EU**
- **4) FID/timing risk in CCS value chain >>>>>>> NZIA and government owned entity as value chain coordinator**
-
- **5) Early CO2 injection vs long term gas production >>>>>> enabling legally simultaneous gas/oil production with CO2 storage**
- **6) CO2 impurities >>>>>>>>>> agreed standards via CEN/ISO (EU or global)**
- **7) Volume risk for infrastructure >>>>>> backed by government/government owned entity**

EU wide templates for contracts needed

The ZEP EU financing working group

- **Founded in November 2024 together with ING bank to develop new financing business models**
- **Participants: CCS project developers, banks and stakeholders**
- **Seeking participants from institutional investors/pension funds, insurance companies and project developers**
- **Comparing lessons learned from UK, The Netherlands, Norway, Sweden**

• Objectives new EU business model:

- **Lower societal costs with acceptable risk/return on equity for companies via private financing**
- **Realizing more projects faster and thus getting closer to EU goals**

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- **Implement EU business model template for financing large scale CCS in Europe with pension funds, banks and insurers**

- **Implement EU decarbonization bank funding for CCS via CFD's**

- **Enable simultaneous energy production and CO2 storage permits**

- **Enable large integrated CCS projects inside and between industry clusters also cross-border using PCI status and CEF facilities**

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Thank you audience and EBN shareholder!

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Jan-Erik Berre

SVP

DNB BANK

Jan-Erik Berre is a petroleum engineer turned financier with a long track record in Oil & Gas, and over the past five years has served as DNB's specialist on CCS and the energy transition, blending technical depth with commercial insight to drive financing in the CCS value chain.

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Knowledge Sharing 2026, CCS&CDR Summit

Workshop #9

Learnings from financing of CCS storage projects

Gassnova, CEM CCUS, IEAGHG, MI CDRR and ZEP

Sandefjord

DNB Bank, Energy Division, New Energies and Utilities

By Jan Erik Berre, Wednesday 15 Apil

Successful financing of CO_2 storage recognize the risks and design for solutions

Key observation from a bank in the current market

CCS is basically waste handling

- We are solving today that we expect will be much more expensive (and painful) to do in the future
- Value in CDR for biogenic CO_2
- Some CO_2 usage

Shared success criteria across existing projects

- Strong state support
- Risk sharing along the value chain
- Stable cash flow – CfD, 45Q underpinning long contracts

Geological CO_2 storage is now bankable – when designed well…..

Focus on storage with third party access, multiple examples of CO_2 storage for dedicated processes

1. As of today, almost 10 storage projects in operation or with Final Investment Decision (FID) taken
2. Most projects are financed over corporate balance sheets
3. Another 20+ is working towards an FID over the next few years. Majority are looking for bank financings

Sources: * IJGlobal.com, Global CCS Institute, Rystad Energy

The UK marked is leading the Project Finance projects wit US tax credit following

In general,** margins are in the wide range of 200 to 400 basis points (bps) over risk free interest

UK RAB - Track 1

- **NEP, Northern Endurance Partner** (FID 2024)
  - GBP 4bn commercial debt
  - Structured in 8 tranches
  - 22 banks
- **HyNet** (FID 2025)
  - GBP 2.5bn commercial debt
  - Structured in 4 tranches:
  - 23 banks
- **ENI, GIP debt raise for CCS JV, UK (ongoing)**
  - GBP 500m HoldCo debt
  - Building on HyNet

Q45 – SDE++

- **Tallgrass Energy Partners, High Plains Carbon Financing SPV**
  - USD 1.1 bn debt in 3 tranches
  - Pricing on debt is between 250-300bps.*
  - 8 banks
  - Financing 2025, FID 2023
- **One of the Porthos owner:**
  - Port of Rotterdam takes on CCS bond, Yen 9bn (EUR 48m), to be used as equity contribution in the Porthos project
  - Financing late 2025, Porthos FID 2022

Sources IJGlobal.com*,Global CCS Institute, Rystad Energy , Copilot **

Examples of bankability of geological storage projects from a bank's perspective

Only UK with RAB and US with Q45 has demonstrated that the required risk mitigants for banks are in place

Type of risk to be mitigated for banks	UK RAB Track 1	Norway N.L. phase 1	Norway N.L. phase 2	Netherlands Porthos	Denmark Greensand	45Q Tallgrass
Stable cash flow to repay loan	RAB	Emitters with CgfD, support and IG Contracts	Emitters with CfD support/IG contracts	Emitters with CfD support/IG contracts		
Long term store–or-pay contracts	RAB	Commercial contracts + N support	Commercial contracts	Contacts backed by SDE++	Commercial contracts incl CfD	Contracts
CO_2 volume ramp-up risks	RAB	Opex support	Commercial contracts	SDE++	Commercial contracts	Phase 1 done,+ contracts
No exposure to CO_2 pricing, EUA	RAB	Commercial Contacts	Commercial Contracts	SDE++ protection	Commercial contracts incl CfD	
Acceptable construction and completion risks	RAB+ Majors	80& Capex support + Majors	Majors, add on	Majors	Pilot is done	Financed after start-up of p1
Acceptable Operational performance risks	RAB + Majors	Opex support + Majors	Majors, add on	Majors	Pilot is ongoing	
Financial security	UK Back stop	Parent Guarantee	Unknown	Unknown	Unknown	
Project-on-project risk	UK Back Stop	N support	Reduced as add on	Majors	Unknown	Financed after start-up of p1
Sound storage site	Strong regulator + Majors	Strong regulator + Majors	Same as p 1	Strong regulator + Majors	Experience by Ineos, Harbour, DUC	Granted permit
Subsurface and leakage risks – also post-closure	Insurance & UK Back stop	Parent Guarantee	Unknown	Unknown	Unknown	Granted permit
Bank security in storage	In place in UK			Unknown	Unknown	

Sources IJGlobal.com, Rystad Energy

Successful financing of CO_2 storage recognize risks and design solutions

Lessons governments should take to heart:

1

Emitters need support

- Emitters must be able to also pay for transport and storage of the CO_2
- CfD's in one form or another is required
- Saving of possible future EUA Opex costs under the EU ETS with or without CBAM is not sufficient

2

All investors need return on investments

- "Nice-to-have", "just-in-case", "wishy-washy" consensus driven policy requirements cost money
- Banks lend against cash flow with low risk
- Make a cross functional task force to optimize laws and regulations, with the industries, along the CCS value Chain

3

Design regulations to reduce risk and thereby cost for the hole value chain;

- Good concession-rules reduce leakage risks and financial security amounts - as risks are taken out
- The rules to manage "what-if" is understood
- Do not regulate as hydrocarbons or toxic waste
- Embrace SPE SMRS

Companies along the CCS value chain need to engage proactively

There is no “chicken & egg” situation – only a waiting game for more subsidies; which is real issue as emitters need support

Cooperation in the value chain	- Engage to build a low-cost CCS value chain - Waiting for marginal pricing of transport and storage will not work - All parties must work on risk allocation in good faith - Government can not sit on the sideline
Cash flow to repay investments	- Long “store-or-pay” contacts is required to repay large capital investment projects - Scale is important to reduce unit cost
Reduce risk and cost	- Use standards where they exists and work to make new when knowledge has matured - Be mindful that guarantee requirements add costs - Work to find new ways to handle risks like “Waiting on Weather” - Insurance industry has a role to play in, among others, the leakage risk

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Dr. Pantelis Vogiatzis

COMMERCIAL LEAD

ENEARTH

Dr. Pantelis Vogiatzis is the Commercial Lead at EnEarth, where he leads the commercial strategy and business development for pioneering carbon storage initiatives, including the flagship Prinos CO_2 Storage Project. With over 20 years of experience in the energy and environmental sectors, he brings deep expertise in regulatory and institutional affairs, corporate operations, compliance, and strategic planning.

He leads market engagement, commercial model development, and strategic partnerships, ensuring alignment with EU regulatory standards and contributing to the acceleration of climate-neutral infrastructure.

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PRINOSCO CO_2 STO

Enabling Bankability through Regulatory and Contractual Design

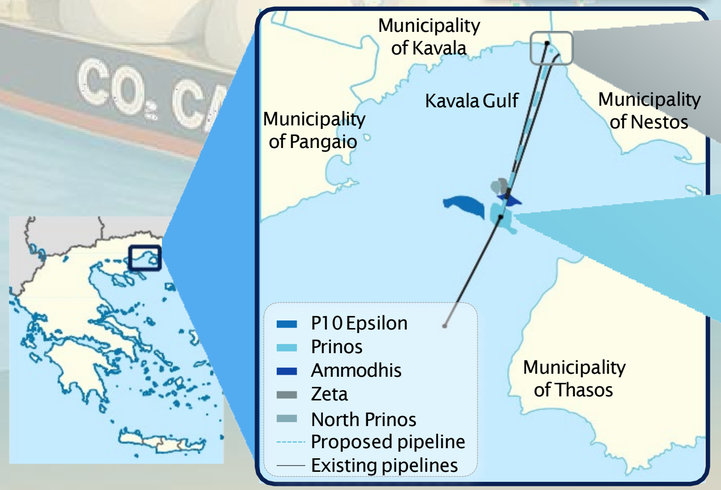
April 2026

EnEarth

Co-funded by the European Union

Prinos CO_2 Storage is a Scalable CO_2 Injection and Storage Project Leveraging Existing Onshore and Offshore Infrastructure

Brown field infrastructure to support speedy project delivery	Prinos represents the only known CO_2 storage site in Greece and the 3rd storage permit holder in the EU
	Potential injection capacity of around **2.8 Mt CO_2/year**
	NSAI CPR(1) confirmed 66.4 MtCO_2 contingent storage capacity (2C)
	The project will be receiving compressed and liquid CO_2 and shall offer long-term permanent storage
Attractive commercial positioning	Prinos CO_2 is included in the 1st and 2nd PCI/PMI Union List of European Projects of Common Interest
	15 MoUs(2) for captured quantities of 6.12 MtCO_2/year have been signed with blue-chip counterparties
	4 CO_2 capture projects totalling 3.8 MtCO_2/year receive funding of €490 MM by the EU Innovation Fund, so the speedy development of a chain is a reality
	c. €270 MM in grants allocated to the Prinos CO_2 Storage Project from the Greek RRF and the Connecting Europe Facility




Sigma onshore plant

Source: Company Information

Notes:
1. NSAI CPR = Netherland, Sewell & Associates, Inc. Competent Person Report
2. Non-binding memorandum of understanding, based on EU Projects of Common Interest application

2

Regulatory Framework as an Enabler

A comprehensive regulatory framework enabling CCS market development in Greece

Full Value Chain Regulation (Primary Law)

- Dedicated **CCS Law** (Law 5261/2025) transposing EU CCS Directive
- **Covers capture – transport – storage** under a single framework
- Establishes:
  - Permitting regime (exploration & storage permits)
  - Monitoring, liability & post-closure obligations
  - Financial guarantees & insurance requirements

Clear Institutional Structure

- Hellenic Hydrocarbons & Energy Resources Management Company (HEREMA) → CCS Competent Authority
- Regulatory Authority of Waste, Energy and Water (RAAEY) → Regulatory oversight (tariffs, codes, market rules)
- Strong alignment with EU framework
- Ensures **regulatory clarity & governance credibility**

Regulatory Framework as an Enabler

A comprehensive regulatory framework enabling CCS market development in Greece

Open Access & Market-Based Allocation

- **Regulated third-party access (transparent & non-discriminatory)**
- Capacity allocated via:
  - Regulated allocation process
  - Market-based procedures (Market Test)

Anchored in:

- Capacity Allocation Code
- Market Test Guidelines

Bankable Tariff Framework

- Capacity-based tariff ensuring cost recovery (CAPEX, OPEX & WACC)
- Regulated tariff methodology ensuring:
  - Transparency
  - Cost-reflectivity
  - Revenue predictability through capacity-based structure
  - Bankability
- Two-part tariff structure:
  - **LCO_2 handling tariff**
  - **Injection & storage tariff**

Contractual & Market Design Integration

- Market Test → structured demand discovery
- Access Contracts → long-term capacity booking
- Standardised rules for:
  - capacity allocation
  - contracting
  - system use
- Enables **transition from interest → binding commitments**

❼ Greece has moved beyond policy ambition —establishing a complete regulatory and contractual framework enabling a bankable CCS market.

Commercial & Revenue Model (Prinos CO_2)

The Prinos commercial model separates volume and cost risks, creating stable, predictable and bankable cash flows

Capacity-Based Commercial Model	• Long-term capacity booking through Access Contracts • Revenue driven by booked capacity (not utilisation) • Provides stable and predictable cash flows
Two-Part Tariff Structure	• Capacity component → recovers CAPEX, fixed OPEX & return (WACC) • Variable component → pass-through of energy costs, EU ETS costs, regulatory charges • Ensures revenue stability independent of utilisation
Revenue Certainty & Risk Mitigation	• Capacity-based model reduces volume risk • Pass-through mechanism reduces cost risk • Alignment with long-term contracts → predictable, bankable revenue profile
Lifecycle-Based Tariff Setting	• Tariffs updated at: Pre-FID, FID, Pre-COD • Increasing cost accuracy → progressive de-risking and improved financing visibility
Cost-Recovery Framework	Tariff designed to achieve: • Full cost recovery (CAPEX & OPEX) • Target return aligned with regulated WACC

Long-Term Liability & Financial Security Framework (Prinos CO_2)

Liability Beyond the Commercial Horizon

- Storage Permit: 25 years
- Injection period: up to 20 years
- Access Contracts: 15 years
- Obligations continue beyond operations:
  - monitoring & reporting (MMV)
  - corrective measures (if required)
  - Site closure & decommissioning
  - post-closure stewardship

Structural mismatch: liability outlasts revenue horizon

Financial Security Structure

- Mandatory total financial guarantee covering operation, closure & post-closure
- Two-layer approach:
  - **Certain (likely) obligations** → Parent Company Guarantee
  - **Uncertain (contingent) risks** → Insurance coverage
- Covers:
  - expected costs (monitoring, closure /ABEX)
  - low-probability risks (leakage, corrective measures)

Transfer of Responsibility

- No automatic release of liability
- Transfer only if:
  - long-term stability demonstrated
  - no significant leakage risk
  - full regulatory compliance
- Subject to approval by Competent Authority

❼ Performance-based exit mechanism

Public Funding as a Catalyst for CCS Deployment in Greece

CCS in Greece is already supported by ~€1 billion in public funding across the full value chain

Storage Infrastructure (Prinos CO_2 Storage)
€270 million grants secured
- **€150 million → RRF**
- **€120 million → CEF**

Enables:
- ➢ CAPEX de-risking
- ➢ accelerated project development

Capture Projects (Industrial Emitters)
EU Innovation Fund:
- IFESTOS (TITAN)
- OLYMPUS (Holcim)
- IRIS (Motor Oil)

➢ **€486 million total funding**

Supports:
- ➢ first-of-a-kind capture
- ➢ industrial decarbonisation

Transport / Aggregation Layer
- Apollo CO_2 (DESFA, Ecolog)

€169.4 million (EU Innovation Fund)
- Role:
  - ➢ CO_2 aggregation & transport backbone
  - ➢ system integration across emitters

From Public Funding to Bankability: Revenue Stabilisation & Capital Structure

CCfDs – Unlocking Demand (Greek CCS Law)

- Foreseen under Law 5261/2025 (Article 37)
- Designed to:
  - mitigate EU ETS price volatility
  - provide revenue certainty to emitters
- Key features:
  - state aid mechanism
  - competitive allocation
  - subject to EU approval

❼ **Targets emitters → unlocks demand for CCS**

Public funding is necessary—but not sufficient for bankability

Public funding:

✓ reduces CAPEX

✓ accelerates deployment

BUT **does NOT**:

- ensure long-term revenues
- eliminate market risk
- secure final investment decisions

Role of Anchor Investors

Provide:

- early-stage confidence
- governance & ESG credibility
- institutional validation

Enable:

- crowding-in of private capital
- transition to project finance

❼ **Catalyst for investment scale-up**

Towards a Bankable CCS Market

CCS becomes investable when the full value chain is aligned

The Three Pillars of Bankability

Public funding
→ reduces upfront CAPEX
→ enables first-of-a-kind infrastructure

CCfDs (Revenue Stabilisation)
→ mitigate ETS price volatility
→ enable long-term commitments from emitters

Contracts (Market Test & Access Agreements)
→ secure volumes
→ provide revenue visibility

System-Level Outcome

Integrated value chain → investable CCS projects

- **All risks are either priced (tariffs) or secured (financial framework)**
- **The challenge is no longer technical — it is about aligning policy, market design and capital.**

Thank you!

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Lesley Harding

GLOBAL HEAD OF STRATEGIC PARTNERSHIPS, ENERGY TRANSITION

LIBERTY MUTUAL

Lesley Harding is Global Head of Strategic Relationships, Energy & Transition Risk, and Global Clients Community Executive within Global Risk Solutions, Office of Underwriting, at Liberty Mutual Insurance.

Lesley is responsible for the execution of Liberty Mutual's global Energy and Transition Risk strategy, including profitability, growth, and strategic market positioning. She leads global industry-specific strategic planning efforts and works across the business to strengthen Liberty Mutual's presence as a partner of choice for clients operating in complex and evolving energy markets. In her role as Global Clients Community Executive, Lesley provides senior sponsorship and strategic leadership across Liberty Mutual's global client community. She acts as an executive-level liaison with major brokers and key global and regional clients, supporting collaboration, relationship management, and the development of client-led solutions across the organisation.

Lesley brings more than 30 years of experience in the energy insurance and risk management sector. Lesley held senior roles at Texaco Inc., Swiss Re, and Willis, and joined Liberty Mutual in 2020 from BP, where she served as Vice President and Global Head of Insurance Risk Management.

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Insurance as Critical Infrastructure for CCS Financing

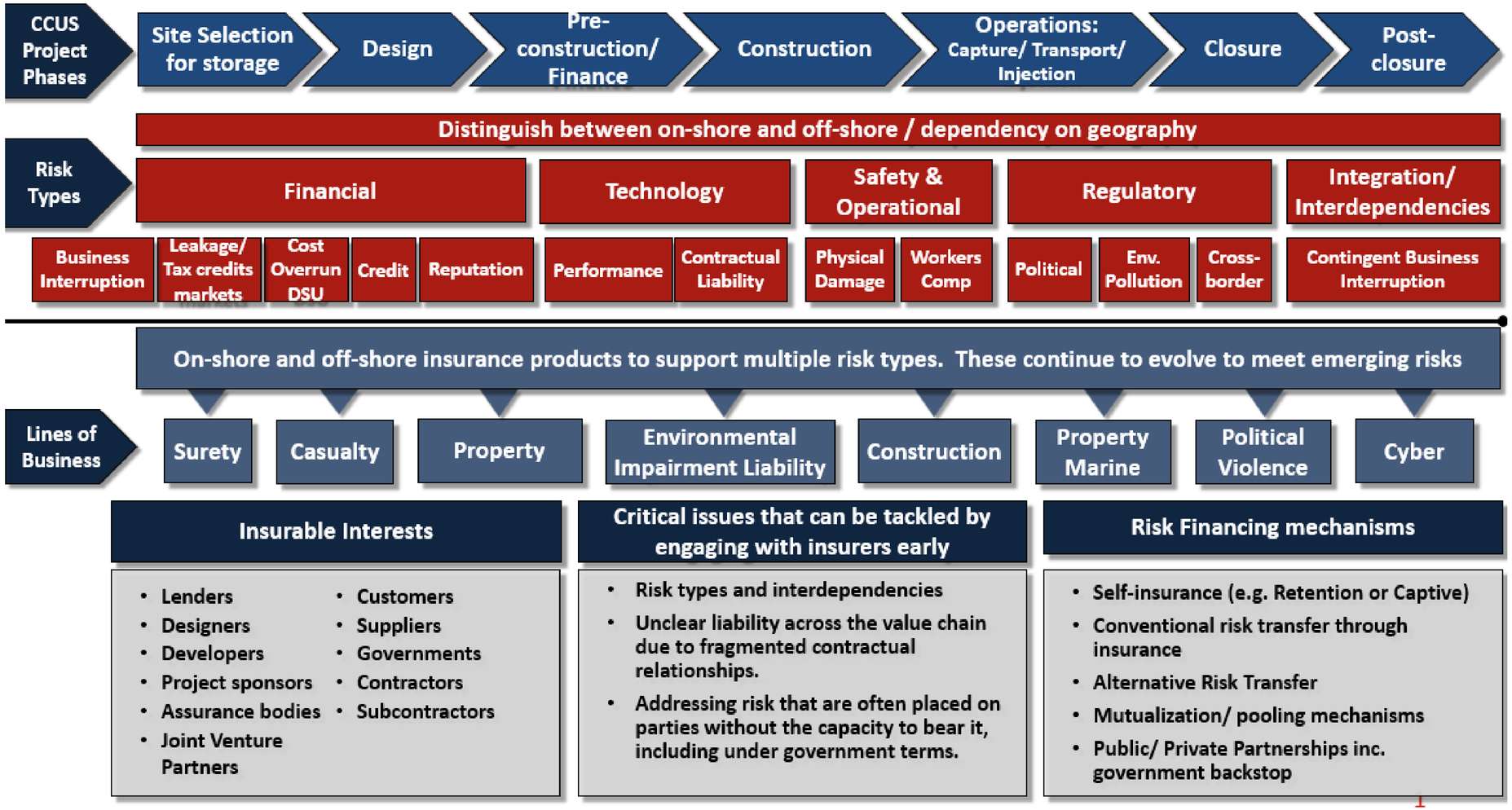
April 2026

Lesley Harding

CCS challenges from insurers perspective

The bankability challenge	Capital-intensive, long-dated assets
	Complex, multi-party value chains
	Long-tail environmental and regulatory risks
	Misalignment between annual insurance and multi-decade liabilities

Risk Framework for CCS



Source: OGCI/CEM/GA Workshop Series

The Two Roles of Insurers

- as capital providers enabling equity and long-term investment and risk carriers enabling debt

- **Deploying patient capital**

- Equity in T&S infrastructure
- Infrastructure debt and private credit
- Alignment with pension funds and public finance
- Strongest where revenues are stabilized

- **Enabling project finance**

- Construction & operational risk transfer
- Business interruption and cashflow protection
- Regulatory financial security and liability cover
- Cross-chain and accumulation risk management

The CCS Risk-Financing Stack

- Self Insurance & Captive Deployment
- Traditional indemnity insurance
- Pooling and mutualisation
- Parametric solutions
- ART and public-private structures

What drives Insurability

- Data transparency
- Contractual clarity
- Early insurer engagement
- Regulatory certainty
- Stable policy frameworks

Key Takeaways

CCS needs insurance to scale

Insurers enable both debt and equity

Risk financing must be layered and planned early

Better risk design reduces cost and accelerates deployment

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CLOSING REMARKS

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17:30-17:40 BREAK

Walk to conference hall - “Parksalen”

CARBON CAPTURE UTILIZATION & STORAGE
AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

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