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Risk Management

Lessons learned from the Network

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10 May 2011 CCS Project Network meeting, Rotterdam, the Netherlands

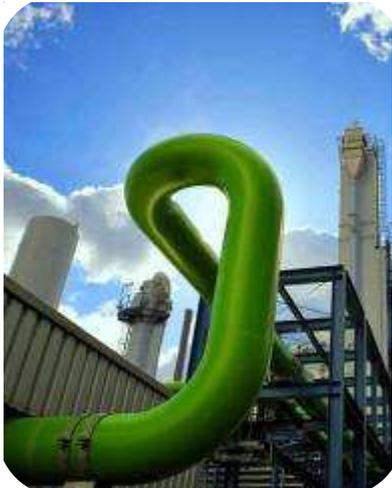
Directorate-General
for Energy



Outline of presentation

- ✎ Experiences and lessons learned from the Network, Jeroen Alberts, Det Norske Veritas
- ✎ Experiences and lessons learned from the Jänschwalde Project, Sascha Lüdge, Vattenfall Europe Generation AG

👉 CCS: Why share on Risk Management



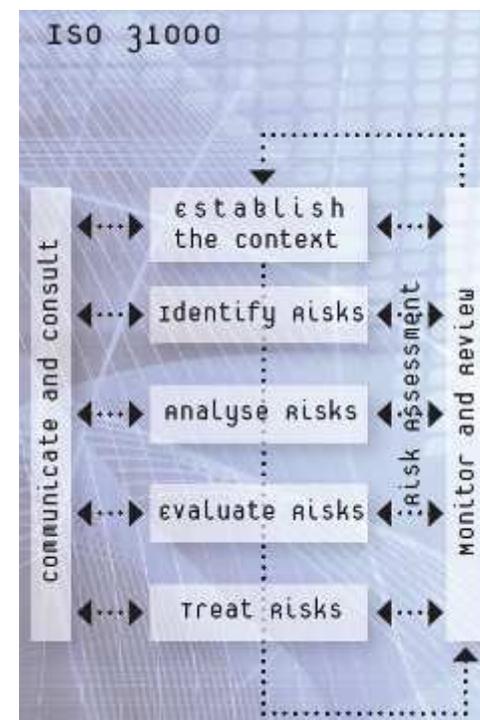
Initial issues:

- 👉 Risks related to funding.
- 👉 Risks related to public acceptance
- 👉 The transposition of the EU CCS directive.
- 👉 Managing interface risks.
- 👉 Risks related to the CO2 stream.

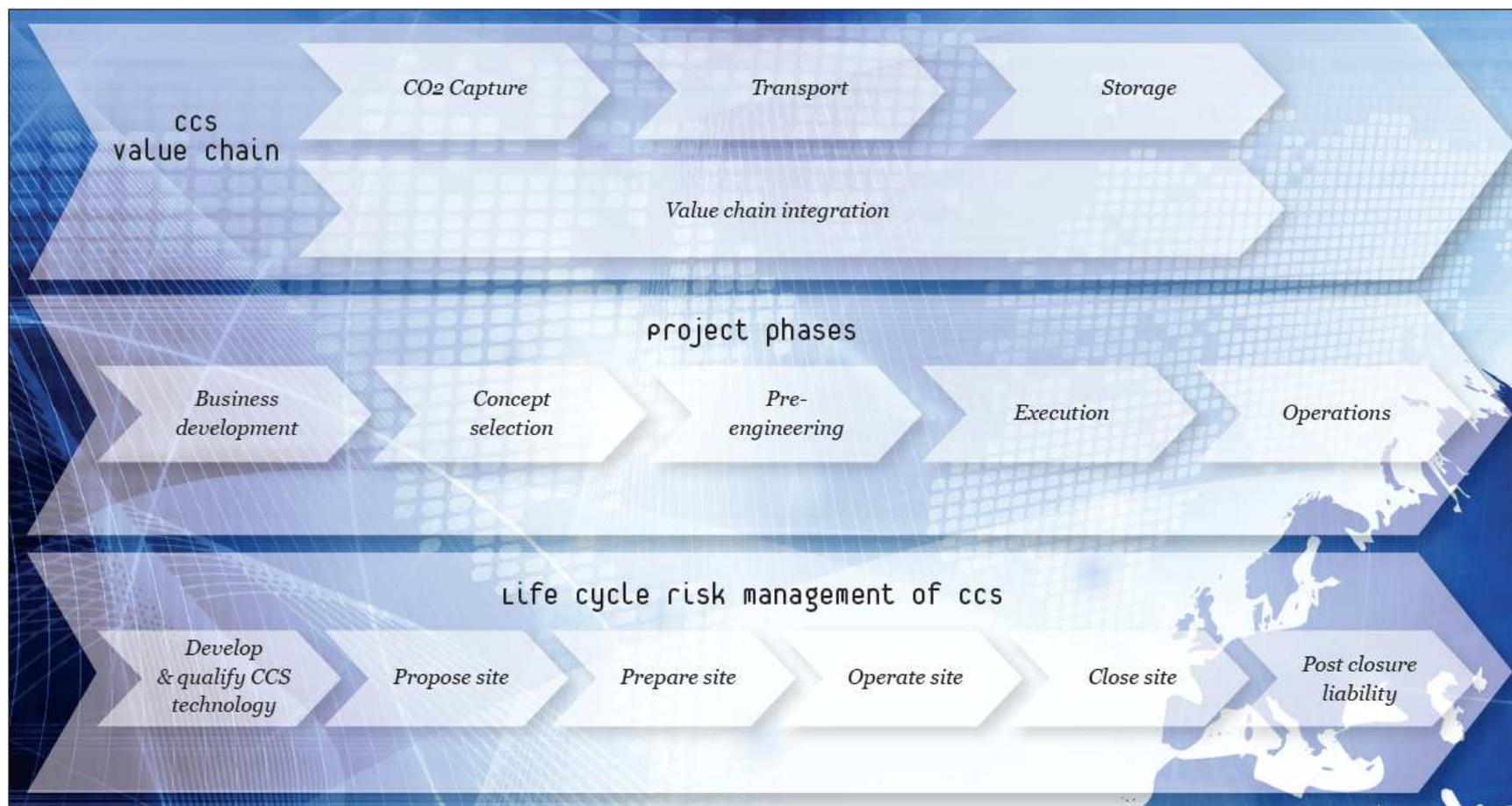
Broad array of risks

Risk Management

- Risk: The effect of uncertainty on objectives: health and safety, environmental, financial goals
- Risk Management: a set of coordinated activities to direct and control an organization with regard to risk. (ISO 31000).
- How: Standard RM frameworks



👉 Perspectives on Risks in CCS Projects

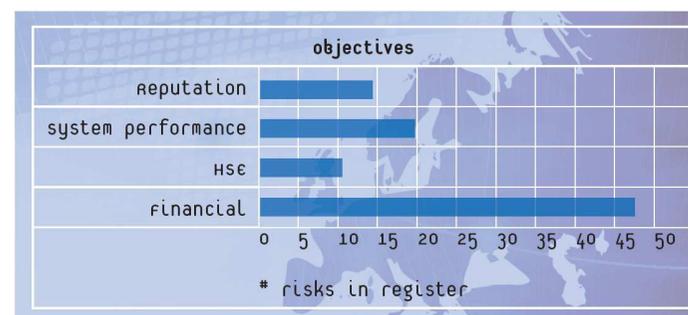


Developing a shared risk picture: Emerging Risk Register

ID	PHASE	RISK CATEGORY	RISK TITLE	CAUSE	CONSEQUENCE	OBJECTIVE			
						financial	HSE	system performance	reputation
3	Value chain	External	Lack of sufficient private funding	The project fails to obtain sufficient loans and other forms of private funding due to unclear risk picture.	The project may be delayed or cancelled	X			
11	Value chain	External	Political influence on planning	Political agendas and timescales may affect the schedule and affect different parts of the CCS chain.	Project delays	X			

👉 Developing a shared risk picture: Initial Analysis

- 👉 49 Risks
- 👉 Most relate to financial objectives
- 👉 Most relate to value chain and storage
- 👉 Most are internal



The majority of the risks identified were not environmental or safety risks

Risks Related to the CO₂ Stream Composition

- ✎ CO₂ stream will contain residual components
 - ✎ Influence system behaviour
 - ✎ Safety, integrity and operability risks
- ✎ CO₂ stream composition is project dependant

- ✎ **Risks are manageable:**
 - ✎ Demonstrated in commercial scale plants
 - ✎ Most effects are understood, R&D can improve understanding and performance.
 - ✎ Mitigation is possible

Risks Related to the CO₂ Stream Specification

- ✎ Specification will be set by projects and regulators
 - ✎ No CO₂ standards exist
- ✎ Risks
 - ✎ Cost increase
 - ✎ Disqualification of technologies
- ✎ Conclusions
 - ✎ Specification should improve HSE and system performance;
 - ✎ Allow demonstration of safe CCS operation, technology and stream compositions.
 - ✎ Specification should reflect project needs

Conclusions

- ✎ Novel and complex nature of commercial scale CCS justifies Risk Management effort
- ✎ Experience of the projects is being collected and organised in an on going process
- ✎ Specific insights were developed on the risks related to the CO₂ stream
- ✎ The collaborative work on risk management has helped the projects to focus on the key challenges

More information...



 **Thank you for your attention**

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