



WHEN TRUST MATTERS

# CCS Infrastruktur: Transport og lagring DNV perspektiver

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# Scaling CCS – a lot of practicalities!

## CAPTURE



- Fossil power plants
- Natural gas CO<sub>2</sub> reduction
- Other industrial processes, e.g. WtE

- Cost efficiency capture rates
- Introduction of new technologies
- Technology review and benchmarking
- Up-scaling risk assessments
- HSE risk assessment
- Accidental release and dispersion
- Value of avoided and biogenic CO<sub>2</sub>


## TRANSPORT



- Temporary storage
- Pipelines
- Ships

- Corrosion
- Material selection and structural design
- Flow assurance and operational issues
- Accidental release and dispersion
- Concept design for CO<sub>2</sub> ships
- Requalification of infrastructure

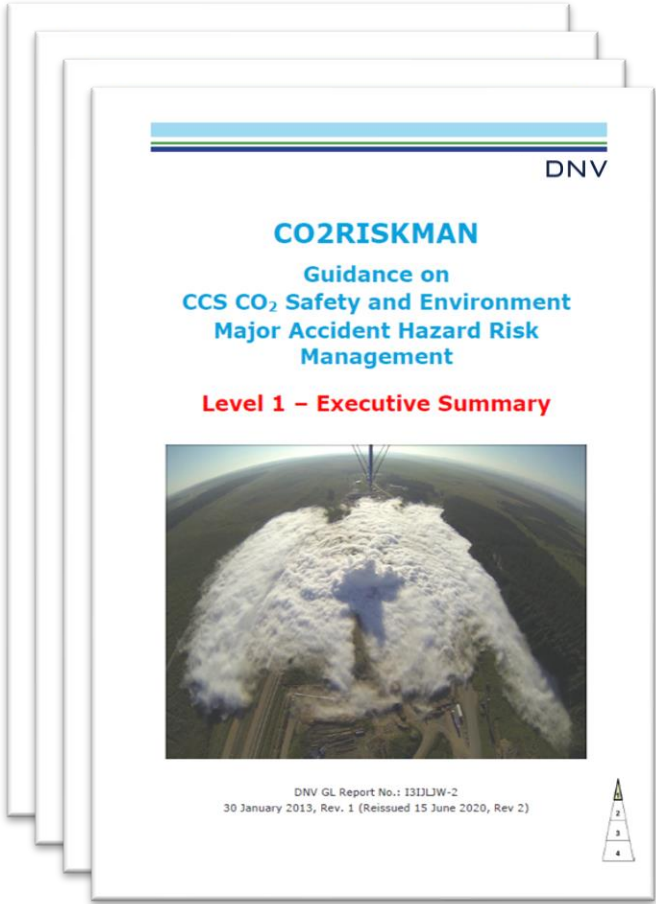
## STORAGE



- Depleted oil or gas reservoirs
- Saline aquifers
- Onshore and offshore

- Verification of storage sites
- Permanence of storage
- Risk management
- Monitoring and verification
- Public concern
- Transfer of responsibility

# Guidance on CO<sub>2</sub> major accident hazard risk management



# Governing rules and regulations CO<sub>2</sub> shipping

- Ship transport of liquid CO<sub>2</sub> is covered by the following rules and regulations:
  - International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, IGC Code, Edition 2016
  - DNV Rules Pt.5 Ch.7 Liquefied Gas Tankers
- Specific requirements for CO<sub>2</sub> transportation were introduced in the DNV Rules in 2011
- Detailed requirements to carriage of liquefied CO<sub>2</sub> were included in the 2016 edition of the IGC Code, distinguishing between high purity and reclaimed quality CO<sub>2</sub>. Regulations for CO<sub>2</sub> can be found in IGC 17.21 and 17.22
- The IGC Code requirements are included in DNV rules Pt.5 Ch.7.
- Some additional requirements have been introduced based on experience with existing CO<sub>2</sub> carriers

