

KEYNOTE SPEAKER

Design Considerations for CO₂ Transportation Pipelines

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DESFA is exploring the benefits of large-scale aggregation of CO₂ in Greece via pipelines and the development of a liquefaction and export terminal. Under this scope, several issues have arisen through the initial design phases that distinguish these pipelines from the transportation of other gases such as natural gas. This paper summarizes these issues as shown below:

- **Pressure and phase requirements.** Decision on the transportation of CO₂ in the Dense/supercritical or Gas phase is an initial decision that needs to be made. Each condition with specific characteristics and advantages
- **Pipeline Infrastructure and Mechanical Design.** The pipeline mechanical design requires several differences compared to typical natural gas pipelines, dictated by the different process characteristics of the CO₂ compared to other gases.
- **Hydraulic Flow Management and Thermal Stability.** CO₂ as a fluid is highly sensitive to temperature/pressure variations as well as the presence water and other contaminants. Special considerations need to be implemented in such cases.
- **Pipeline Routing Considerations/Safety and Environmental Concerns.** Although not a flammable or explosive gas, its thermodynamic phase characteristics and the fact that it can be toxic in relatively small concentrations, creates special safety requirements regarding distances from populated areas, valve station density as well as special material requirements for control of crack propagation and corrosion damage.