

CO₂ Quality Requirements for CO₂ Capture, Transport and Storage from a Lignite Fired Power Plant

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Abstract

A study on CO₂ quality requirements was carried out as literature review and made calculations.

It was found that even though there exist knowledge about the potential hazards of compressing, transporting and storing CO₂ with small amounts of other components characteristic for the different CO₂ capture technologies, there is not enough knowledge yet to specify limit values in most cases.

It has been recognised that knowledge on the CO₂ properties, under processing, transport, injection and storage conditions, are essential of determining reasonable/acceptable impurity levels.

A conclusion is that technically and economically efficient, industrial methods to significantly reduce the water content in the CO₂ stream should be searched, as well as or alternatively methods to use inhibitors that can eliminate the effect of the water content, such as corrosion etc.

Separation of non-condensable gases in the cases with high levels (mainly the oxyfuel cases) is probably to be recommended to avoid problems with 2-phase flow but also to decrease the amount and thereby the cost of transporting and storing the gas stream.

Major experiences on large flow CO₂ transportation originate from pipeline transportation of CO₂ for enhanced oil recovery operations. For other transport modes, such as ship transport, and transport for other purposes such as storage in saline aquifers, more experience have to be built up.

Several knowledge gaps have been found concerning injection of impure CO₂ streams.

At present, little is known about the risks of a leakage out of the reservoir and through the ground surface.

In further studies, co-capture aspects of SO₂ and/or H₂S should be investigated more, including a cost-benefit, risk assessment and environmental assessment.