Transporting CO_2

Transport is a necessary stage in the CO_2 capture and storage (CCS) chain as it is not common for power stations to be built in close proximity to potential storage formations, especially as many storage options are off-shore. Pipelines and ships are therefore needed to transport the CO_2 from the source to the storage area.

Existing Pipelines

CO_2 has been transported via pipelines since the 1970's, predominantly in relation to Enhanced Oil Recovery (EOR). As described in another Information Sheet, EOR is an expanding industrial activity, where CO_2 is used to produce more oil than conventional methods would otherwise manage. As EOR is conducted more extensively, pipeline networks are being built to facilitate this, and in 2013 there are almost 6000km of CO_2 carrying pipelines in the world, mainly in the USA.

Another potential benefit is that the existing pipelines that are currently used to transport oil and gas from where they are produced could be re-used to transport the captured CO_2 to storage formations.

Transport via Pipelines and Ships

In many ways, the transport element of CCS can be viewed as the simplest – there is a vast amount of experience in terms of transporting gas via pipelines and ships, and the technical side of this part is quite straightforward. Costs vary depending on location, terrain and method of transport. Depending on the length of transport needed and the likely length of time that the CO_2 will be transported to a specific location will affect which is the more economical option: pipes or ships.

Pipeline Networks

Although predominantly associated with power stations, CCS can also be applied to some industrial processes, and it is often the case that industrial sites that have high potential for CO_2 capture are found in the same region. This provides an opportunity to simplify the pipeline or transport aspect, as the captured CO_2 can be merged and transported as one, rather than each capture plant having its own dedicated pipeline. This can help to reduce the costs of transport infrastructure, and the costs of transport itself.

It is anticipated that where several storage formations are found in close proximity that there could be similar networks at the other end of the pipeline, where CO_2 can be diverted to one storage formation or another, after sharing the pipeline that transported the CO_2 from the capture facility.

Summary

Transport is likely to be the simplest element in technical terms of CCS, however concerns exist over routes and the appearance of pipelines. It is anticipated that pipeline routes will likely follow existing 'corridors', alongside existing pipelines to minimise impacts, however this may not always be possible, and each case would need assessing on its own merits.