



News Release

Date: 25 November 2009

TUV NEL seminar highlights implications of technological advancements to help achieve the UK's CCS goals on time

A recent Carbon Capture and Storage (CCS) conference, which was organised by TUV NEL, addressed the technological developments needed to put the UK and other countries on the path to achieving full-scale capture, transportation and storage of CO₂ emissions.

While the UK Government and various bodies are putting in place the necessary legal framework and financial incentives to accelerate the arrival of CCS, the conference, which was held on November 25, 2009 at Aston Conference Centre in Birmingham, brought together key industry players from each element of the CCS chain to discuss the challenges involved in taking CCS from a concept to a reality.

The technological needs required to take CCS forward was the key focus of the seminar sessions. The topical areas addressed at the seminar included:

- **Pilot Plants:** The latest development and learning from the CO₂ capture pilot plants
- **Transportation:** The practicalities and challenges associated with transporting CO₂ by pipeline and ship
- **Measurement & Reporting:** The needs and challenges associated with process and regulatory measurement throughout the CCS chain, from capture to injection into the storage formation
- **North Sea Storage:** The value, capacity and qualification of the North Sea for CO₂ storage
- **Post Geological Monitoring:** Ensuring the safe containment of CO₂ in the geological storage sites

The event was chaired by Lynn Hunter, who leads TUV NEL's CCS technical research activities.

Lynn commented: "The engineering infrastructure and building blocks necessary to take CCS forward will be on a scale never experienced before. The difficulties of handling such large volumes of CO₂ will present many unique challenges, which will have to be resolved in a timely manner should the timescales for CCS be met.

"The first priority will be to implement CCS in large-scale fossil fuel power stations. These alone account for over 30% of UK CO₂ emissions. Thereafter, it will be necessary to roll CCS out into other heavy CO₂ emitting industries. However CCS still remains to be technically proven on the scale required to take it forward to power stations, and the various elements of the CCS chain - capture, transportation and storage – still need to be brought together and demonstrated. This is the next stage that is required in the development of CCS."

One of the major challenges at present is the initial stage of capturing CO₂ from other flue gases before release into the atmosphere. There are three main technologies being considered: post-combustion capture, pre-combustion capture and oxy-fuel capture, all of which are currently being developed and trialled in pilot plants around the world. The success of the Longannet pilot plant which trialled post-combustion capture technology on a live power station for the first time, and the developments at Doosan Babcock's oxyfuel pilot in Renfrew, along with other R&D led by RWE npower, has put the UK on the path to taking CO₂ capture from the pilot stage to full-scale demonstration.

The second stage in the process involves the planning and development of the transportation infrastructure which also presents challenges. This involves safely and economically transporting CO₂ to its final geological storage formation by ship, road and pipeline. The latter will rely on the development of suitable pipeline infrastructure spanning several hundred kilometres across land and sea. A number of UK pipeline network clusters have been proposed to serve the needs of the various power stations and heavy emitters. Although there are currently few existing shipping vessels around the world capable of handling CO₂, a number of studies have shown that the routing of CO₂ pipelines in the UK is completely feasible and achievable. With its close proximity to North Sea storage sinks, the UK is in a strong position to establish the world's first CCS pipeline network.

The third stage in the CCS chain is the injection and storage of CO₂ into secure geological formations. Largely, this will entail storage in depleted oil and gas fields and in saline aquifers. Qualifying geological storage sites will be a critical part of the CCS process. The North Sea has been identified as having valuable storage capacity and is expected to become the CO₂ storage sink for Europe. Data presented by the British Geological Survey provides reassurance in the safety of storing CO₂ offshore. With an

estimated storage space of around 22 billion tonnes the North Sea undoubtedly presents the UK with a real opportunity to establish a lucrative CO₂ storage industry for the whole of Europe. However, these estimates have to be firmed up and further qualified to unleash the true potential of the North Sea, particularly for saline aquifers which make up the majority of estimated storage space.

Measurement and monitoring of CO₂ leakage from the point of capture, through to injection into the storage formation will play a key role in demonstrating CCS and in reducing uncertainty. However, there is a need to establish suitable and accurate methods to measure CO₂ in pipelines for verification purposes as reported by TUV NEL in their study produced for the National Measurement Office. Once in the storage space, although current technologies can detect and locate CO₂ leakage, there is still a need for the development of technology to accurately quantify leakage.

Although the UK has made steady progress to date in developing the various technologies required to take CCS forward, overall there is still a considerable amount of work to be done over a relatively short timescale if the UK is to maintain a lead on CCS and reap the economic benefits.

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Editors Note:

About TUV NEL: TUV NEL is a leading international technology services organisation. With a successful track record of more than five decades delivering world class innovative solutions to difficult problems we provide services, solutions and technology to clients across many industries including oil & gas, government, manufacturing, renewable and sustainable energy on a local and a global basis. It is part of the TUV SÜD Group, the leading international service organisation. With over 13,000 employees, it is represented worldwide at more than 600 locations.