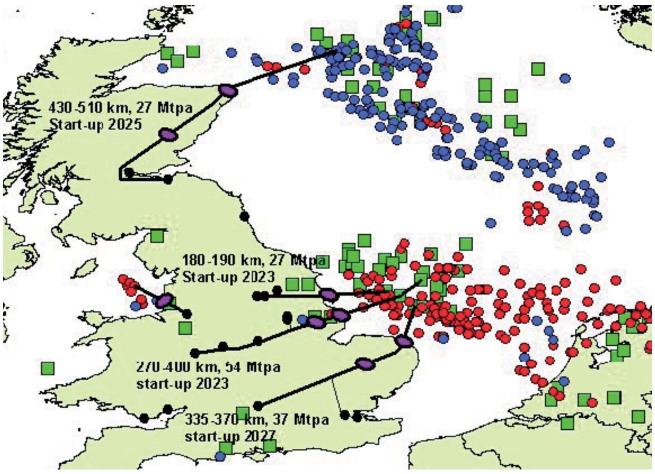
Pathways in Washington

discussing the role of CCS in the European electricity supply system

Project results were presented at the 9th International Conference on Greenhouse Gas Control Technologies (GHGT), the main international event on CCS with more than 1200 attendees. The GHGT conferences are held every two years in IEA GHG's member countries. The conference series rotates between, North America, Europe and Asia. Three scientific papers were presented from the European Pathway project, two of the papers presenting possible role for CCS in pathways for the European electricity system up to the year 2050.

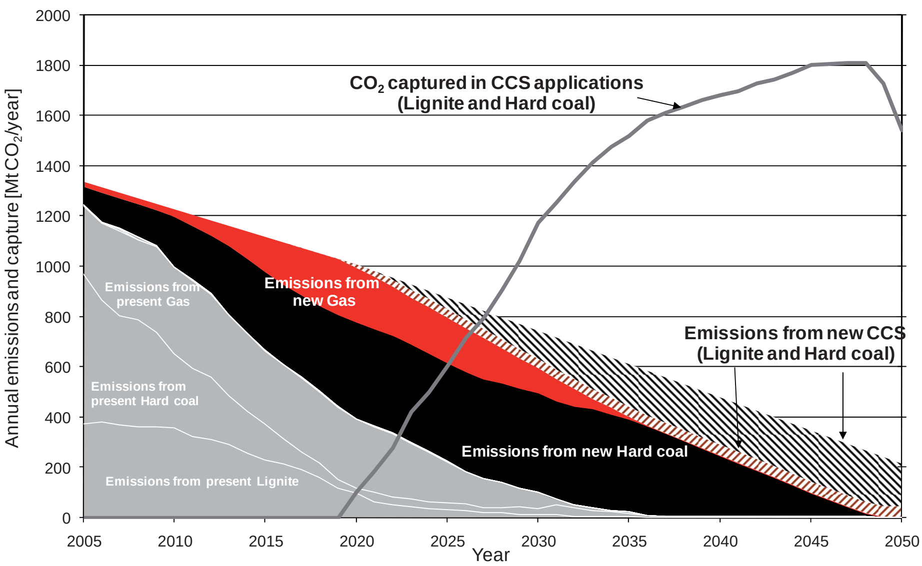
Pathways investigates the role of CO_2 capture and storage (CCS) technologies as part of a portfolio for reducing CO_2 emissions from the European electricity supply system until the year 2050. Since the ability of different EU Member States and regions to facilitate and to benefit from CCS will most likely depend on local conditions in terms of current energy mix, fuel supply chains and distance to suitable storage locations, special emphasize is put on analyzing turn-over in capital stock of the existing power plant infrastructure, timing of invest-ments and the infrastructural implications of large scale introduction of CCS on a regional perspective. The results show that it is possible to meet an 85% CO_2 reduction target by 2050, but this will require large contribution from CCS. As expected, regions which are currently high in carbon intensity and which are located nearby suitable storage sites will benefit mostly from CCS as an option. With the assumption that CCS will be commercially available in 2020 the model results give a steep ramp-up in the use of CCS post 2020 which imposes challenges for timely investments in corresponding CCS infrastructure.



CCS infrastructure as obtained from the analysis of this work. UK

Ramp-up of large-scale CCS infrastructure

The analysis shows also that most MS have identified structures that may be suitable for subsurface storage of CO_2. Fourteen MS have so far identified onshore reservoirs only. Several MS have clusters of large power plants along with considerable national or regional concentration of plant ownership, factors that may both facilitate the ramp-up of a bulk CCS infrastructure. Phasing in of CCS plants over time will obviously play a key role in building up large-scale transport infrastructure. CCS plants are likely to be located on existing sites and coal plants currently under construction may choose to retrofit the plant for CCS instead of building new plants. CO_2 pipeline trajectories are likely to follow existing trajectories for natural pipelines, minimising inter-ference with the surroundings and facilitate and speed up permitting processes. Timing, conflicts of interest and public acceptance, especially onshore, are other factors that may become an issue with regard to transport and storage of CO_2. According to model results, some 5.2 Gt CO_2 is transported and stored in Germany between 2020 and 2050 while the corresponding figure in the UK is 3.7 Gt. Based on assumed injectivity, total system costs up to 2050 range between € 18 and € 23 billion in Germany and between € 20 and € 30 billion in the UK while specific costs range between € 3.4 and € 4.4 per ton of CO_2 in Germany and between € 5.4 and € 8.1 in the UK.



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