

Other - IMAGE

CCS

For carbon capture and storage, three different steps are identified in the TIMER model: CO₂ capture and compression, CO₂ transport and CO₂ storage. Capture is assumed to be possible in electric power production, half of the industry sector and hydrogen production. Here, alternative technologies are defined that compete for market share with conventional technologies (without CCS). The former have higher costs and slightly lower conversion efficiencies and are therefore not chosen under default conditions; however, these technologies increase much less in price if a carbon price is introduced in the model. Capture is assumed to be at a maximum 95%; the remaining 5% is still influenced by the carbon price. The actual market shares of the conventional and CCS based technologies are determined in each market using multinomial logit equations. The capture costs are based on Hendriks et al. ([Hendriks et al., 2002](#); [Hendriks et al., 2004a](#); [Hendriks et al., 2004b](#)). In the electric power sector, they increase generation costs by about 40-50% for natural gas and coal-based power plants. Expressed in terms of costs per unit of CO₂, this is equivalent to about 35-45\$/tCO₂. Similar cost levels are assumed for industrial sources. CO₂ transport costs were estimated for each region and storage category on the basis of the distance between the main CO₂ sources (industrial centres) and storage sites ([Hendriks et al., 2004b](#)). The estimated transport costs vary from 1-30 \$/tCO₂ – the majority being below 10\$/tCO₂. Finally, for each region the potential for 11 storage categories has been estimated (in empty and still existing oil and gas fields, and on and off shore – thus a total of 8 combinations); enhanced coal-based methane recovery and aquifers (the original aquifer category was divided into two halves to allow more differentiation in costs). For each category, storage costs have been determined with typical values around 5-10\$/tCO₂ ([Hendriks et al., 2004b](#)). The model uses these categories in the order of their transport and storage costs (the resource with lowest costs first).