

CARBON CAPTURE AND SEQUESTRATION (CCS)

Carbon Capture and Sequestration is in its infancy and needs to overcome significant technology and cost challenges to become a viable solution. Despite its importance to the future of coal, CCS research and development is moving slowly. Immediate and decisive action is needed to facilitate investment in developing and assessing the viability of CCS technology.

The process of Carbon Capture and Sequestration (CCS) (also referred to as Carbon Capture and Storage) involves five steps: (1) capturing CO₂ emissions, either pre- or post-combustion, (2) compressing this to a liquid, (3) transporting it to a suitable site, (4) pumping the liquid underground at very high pressure, and (5) monitoring (for up to 10,000 years!) to ensure the carbon remains permanently locked away.

In theory, CCS has the potential to almost completely eliminate carbon emissions from burning coal. As such, it is the only known technology with potential to allow the industry to continue more-or-less unaffected, minimizing disruption to all those involved in and supported by the coal industry. There are, however, two key challenges to making CCS widely available: technology and cost.

Despite much talk and hype, CCS technology is in its infancy. There are small scale pilots scattered in various countries, including Australia, yet so far there are no commercial examples of end-to-end CCS anywhere in the world. Technological challenges exist at almost every level. In many cases, individual technologies have been proven at pre-pilot or pilot levels, but have a long way to go before they are proven commercially. Beyond this, there is a need to integrate all of these technologies to create end-to-end CCS – starting small and then scaling up. A further challenge is that for the most part, CCS solutions cannot be retrofitted to existing plant. Commercially and strategically, Australia has much to gain if it can make headway with this technology, given its large coal resources.

In addition to the technological challenges, there is a very significant cost issue. The cost of CCS is currently predicted to range from A\$70 to A\$100 per tonne of carbon dioxide captured. This means that until there is a guaranteed carbon price above \$100, there is no incentive to invest in these solutions, leaving CCS reliant on government grants. Even if such a carbon price existed, clean coal electricity would still be priced out of the market, since a range of emissions-free renewable energy options already exist at a much lower price point, making them a more attractive investment option. Therefore, CCS is unlikely to become economically viable until and unless the costs fall significantly.

Even if the above issues are resolved, timing is also a major constraint. Advocates of CCS do not see the technology and cost issues being overcome, and CCS widely deployed, before 2030. Accordingly, CCS will not play a part in achieving our medium term emissions reduction goals. If CCS is to form part of the solution beyond 2030, a rapid and immediate acceleration of R & D from its current snail's pace is required. In the current investment climate, this is a huge challenge.

CCS has widespread support in the coal sector; outside this sector, there are mixed views and considerable scepticism as to whether the technological and cost challenges can be resolved in any meaningful timescale. Looked at with a cynical eye, it is easy to imagine that the support from the coal sector could be as much about creating a story for the continued relevance of coal, as it is about CCS being a viable solution. Indeed, it could be that coal interests are best served by delaying action on CCS, since that action could prove that CCS is not viable.

Australia is strongly reliant on coal and it is in our interest to create a solution to coal emissions. This would secure the future of our coal export industry and domestic energy supply. The only way to resolve this uncertainty is to push ahead as fast as possible with advancing the technology to full commercial availability. This requires the government to invest directly and deeply in solutions, or create the right economic conditions to allow private investment to flow in. There are signs that this is beginning to happen with the establishment of the Global Carbon Capture and Storage Institute in Canberra this year.