

Carbon capture and storage hopes are pipe dreams, for now

By Clyde Russell, Reuters

Nov 23, 2023 - Carbon capture and underground storage (CCUS) is touted by proponents of fossil fuel production and consumption as the technology that will keep oil and gas in the global energy mix.

It is, and at the same time it isn't.

The International Energy Agency (IEA) delivered a dose of reality on whether CCUS can be deployed at sufficient scale and with viable economics in its latest report, released on Thursday.

While the global oil and gas industry is well placed to scale up technologies to help achieve the goal of net-zero emissions by 2050, the IEA warns of pitfalls.

One of those is what the agency, which represents developed nations, called "excessive expectations and reliance on CCUS".

It called CCUS an "essential technology for achieving net-zero emissions in certain sectors and circumstances, but it is not a way to retain the status quo".

The key word in the above quote is 'certain', meaning that CCUS is a viable technology to reduce emissions in some cases, but it is far from the silver bullet it is often made out to be, largely by major oil and gas producers and their supporters.

The IEA produced some sobering numbers in its report, *The Oil and Gas Industry in Net Zero Transitions*.

If oil and natural gas consumption does evolve as projected under current policy settings, the IEA said this will require an "inconceivable" 32 billion metric tons of CCUS by 2050.

This would include some 23 billion metric tons sequestered by direct air capture technologies, which in turn would require some 26,000 terawatt hours of electricity generation to operate in 2050, which is more than the world's electricity demand in 2022.

If there is still hope for widespread CCUS as the solution for oil and gas production, the IEA further said \$3.5 trillion in investment will be needed every year from now to 2050.

In other words, CCUS as the preferred solution of oil and gas companies trying to secure a long-term future in a carbon-constrained world is largely a pipe dream.

That said, CCUS does have a role to play and it can be expanded, as long as governments get the policies in place to incentivise storing carbon.

The IEA said about 45 million metric tons of carbon dioxide is currently captured globally by CCUS projects, although three-quarters of this is used for enhanced oil recovery, in other words the stored carbon is used to produce more fossil fuels that will release emissions when combusted.

While the IEA said more than \$3 billion was invested in CCUS projects in 2022, only 5% of the ventures have reached final investment decisions, representing only 10 million metric tons of carbon capture and 20 million of storage.

LACK OF INCENTIVES

The slow pace of advancing CCUS is largely because of a lack of incentives for investors to take on what are usually large and complex projects, involving multiple partners.

It is perhaps ironic that oil and gas companies and many of their political backers, especially on the conservative side of the spectrum, tout CCUS as a major solution, but at the same time don't push hard for the financial and policy settings that would enable a faster roll out.

Another issue for widespread and large-scale CCUS is gaining confidence that it will work as intended.

The largest operating CCUS project in the world, at Chevron's Gorgon liquefied natural gas plant in Western Australia state, has a mixed record.

While it is storing carbon, Chevron acknowledged earlier this year that it is operating at a third of capacity amid operating difficulties.

In some ways Gorgon is symbolic of the challenges facing CCUS as a whole.

It has shown that CCUS can work at scale, but at the same time it has also shown just how difficult it is to run a project of that size and complexity.

There is little doubt that the oil and gas industry will learn from experience and get better at doing CCUS.

They have a strong track record of innovation and finding engineering solutions.

But there is a massive gap between CCUS hopes and realities, and the IEA report goes a long way towards identifying the issues.

The opinions expressed here are those of the author, a columnist for Reuters. (Editing by Muralikumar Anantharaman)