

## All hands to the pump

In January 1974, the Guardian newspaper carried an [article](#) by science writer, Anthony Tucker. The headline was *Space satellites show new Ice Age coming fast*. Let's not hold Mr. Tucker responsible for a headline writer's 50-year-old version of clickbait. The substance of his article follows a cautious approach and notes that the analysis is based on information that requires more interpretation. While I doubt we need further evidence that long-term predictions are uniquely risky, this headline certainly reminds us. In our time, we have accumulated a considerable amount of climate data and have spent decades analyzing it. We are now beginning to experience firsthand the climatic events that models had forecast some time ago. What is uncertain, and open to prediction, is whether we can halt climate change and, if so, how do we do it. The consensus is that the best approach is to limit greenhouse gas emissions and, if possible, reduce the existing accumulations. And from here the debate begins. Different interests have different favourite approaches. That leads to champions of one disparaging others as a waste of time and resources. The certainty with which some ideas are promoted should alert us to the "ice age prediction risk".

One option that comes under attack is carbon capture and storage (CCS). It is often criticized because it's used for enhanced oil recovery (EOR). Critics argue that it sustains the use of fossil fuels. I'm not sure that is a CCS problem as much as a fossil fuel demand issue. According to the International Energy Agency, fossil fuels accounted for [80%](#) of world energy use (2019 data). I doubt curtailing CCS is critical to moving that number downward.

Daniel Yergin, distinguished author and energy analyst, [speaking in Washington](#) in January, said that the transition of energy systems must be multi-dimensional and include CCS. Later in the spring at the annual CERA Week energy conference in Houston 18 panels were devoted to different aspects of the subject.

Matthew Healy, Managing Director of Pace CCS, a carbon capture engineering design firm presented a [case](#) for the technology at CERA Week. He acknowledged that it has obstacles still to overcome if it's to make a substantial contribution to emissions

reduction. But it is a young technology. He noted that he would be considered an expert, although he has only been working on it for 5 years.

Mr. Healy said that there have been good-faith criticisms of CCS, but some have been weakened by drawing on flawed or outdated analysis. For example, he pointed to one claim that electricity from a CCS-equipped, coal-fired electricity generation facility was 6 times more expensive than a wind power plant using storage. The analysis, however, drew this result from the lowest-cost wind project in the jurisdiction and the highest-cost CCS operation. The comparison was valid between the two facilities, but it can't be generalized beyond them.

Another organization claimed that the GHG recovery from a coal-fired generating station was only 70%. Mr. Healy stated that the capture ratio of the plants that Pace designs is at least 97%. The lower number cited by critics was based on an analysis that failed to distinguish between GHG emissions from the CCS process itself and fugitive methane emissions from the coal mine supplying the plant. The study grouped emissions from both activities, which effectively masked the capture effectiveness of the CCS process.

If we are to progress in addressing GHG emissions reductions, we need to be open to a variety of approaches. We do the environment no favours by hastily dismissing approaches and technologies that are in the early stage of development. Let's remember that the seemingly impossible recovery of oil from oil sands progressed from bucket wheel capture of material to giant excavators and later to steam-assisted gravity drainage. Subsequently, the reduction in GHG emissions per barrel followed the same "learning by doing" path. The stakes are too high to direct our efforts into partisan arguments. We'll need everyone's ideas to get where we want to go.