

## **Trust in Carbon Capture Technology Slows Climate Action Today**

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There is no clear path for the world to meet its pledge to limit global warming to 1.5°C. Since the pledge was made in the 2015 Paris Climate Accords, global emissions have continued to rise. Optimists are now betting on innovative carbon capture and storage technologies (CCS) as the last viable route to limiting CO<sub>2</sub> levels in the atmosphere. There is just one problem: CCS are not technologically mature and too expensive to operate at scale. In this essay, I argue that staking the future of humanity on unproven carbon capture technologies risks delaying climate action today. This is a case of unwarranted techno-optimism, where technological innovation greenwashes fossil fuels and disincentivizes systematic change. Instead, political decision-makers need to focus on minimizing the impact of the climate crisis today. That means changing policies and mindsets today, not waiting for a silver bullet.

### **Carbon capture and storage technology minimizes fossil fuel emissions**

There is a clear mismatch between what CCS promises and what it can realistically achieve today. CCS works by removing CO<sub>2</sub> from the atmosphere and storing it permanently (Robertson & Mousavian, 2022, p. 6). CCS is beneficial in the context of fossil fuel processing and carbon-intensive industry, where it captures carbon emissions at the source (Robertson & Mousavian, 2022, pp. 11-13; Roberts et al., 2021, pp. 1571-1573). The International Energy Agency predicts a fivefold increase in CCS capacity by 2030 – yet concedes developments are ‘not on track’ (IEA, 2022). To combat the climate crisis more broadly, CCS would need to work on a drastically larger scale, capturing the emissions from all sorts of industrial pollutants. The technology needs significant investment and development to make a tangible impact (Economist, 2022). Yet many emission models already incorporate CCS as an important component to reaching net zero emissions (Gayle, 2022). CCS may *eventually* mature technologically, but we should not bet our planet on a potentiality. It is important to keep the immediate political imperative in mind: carbon emissions have to be reduced today.

### **CCS extends a lifeline to fossil fuels**

With the Paris Climate Accords' 1.5°C goal out of reach, political resources need to go towards mitigating global warming now, and carbon capture being a significant part of the solution looks unlikely. *So why does CCS keep attracting so much attention?*

One reason is the influence of the energy industry. CCS is a technology that promises decarbonizing fossil fuels (Gayle, 2022; Robertson & Mousavian, 2022). CCS projects utilize the infrastructure and expertise of the fossil fuel industry (Robertson & Mousavian, 2022, pp. 71-73). If CCS works, Big Oil stays relevant even if actual fossil fuel production declines.

Stakeholders beyond energy also resist radical change that could harm them. Vested interests from industry groups to trade unions seek to hedge against the inevitable structural reforms that will result from a move to a green(er) economy (Lawrence et al., 2019; Thomas & Dörflinger, 2021, p. 27). Not wanting to lose out, they stall or seek concessions. The new coal mine announced in the UK illustrates this apparent mismatch between niche and public interest (Harvey, 2022).

Countries in the Global South see fossil fuels as crucial to their economic development – which is a realistic assessment (Al Jazeera, 2022; Baker & Ramachandran, 2022). Whether the United States and China, the two biggest polluters worldwide, are committed to achieving net zero remains to be seen (CAT, 2022a; CAT, 2022b). As it is, global emissions will continue for the foreseeable future, and carbon capture is expected to provide the necessary cleanup – if it works.

In effect, CCS extends a lifeline to the fossil fuel industry. It repurposes the engineering skill and energy infrastructure that the fossil fuel industry has built over decades. There are other stakeholders that also have an interest in continued fossil fuel use. This includes countries in the Global South and the US and China, which are not on track to net zero. CCS is appealing to all of these stakeholders because it greenwashes and legitimizes a very profitable industry, ultimately delaying its much-needed phase out.

### **A technical solution to a political problem**

Effectively addressing climate change is a political problem. Political accountability is lacking, as the systems designed to incentivize change are flawed. Market-based mechanisms are often ineffective. Even where schemes like Cap and Trade and carbon markets exist, as they do

in most G20 countries, the carbon prices they set are too low to meet emission targets (OECD, 2021, pp. 12-14). Politicians think in short-term electoral cycles. Just as short-term-oriented businesses resist change, so do politicians more worried about the next vote than climate change 20 years later. Global and local institutional structures should be adapted to ensure politicians take a more long-term perspective. Political resources and focus are finite, and inflation and energy costs are rising. Voters worldwide understandably have more immediate concerns than the abstract threat of a climate collapse. If climate change is politically deprioritized, it will become more difficult to combat.

There is another reason why policy-makers project CCS to have a significant impact on carbon emissions. CCS perpetuates the idea that no matter the challenge, more technological innovation will improve things (Danaher, 2022, pp. 52-54). This continued techno-optimism is not per se wrong, but it misses the point. The issue today is a lack of action *despite* the necessary capabilities, not that climate change is something we cannot yet address. Techno-optimism allows for framing the climate crisis as a problem that can be resolved without any systemic behavioral changes – and CCS is the prime candidate for techno-optimists.

### **Even if CCS works, energy systems will need to change**

Carbon capture, and storage technology may eventually live up to its promise. Even today, it can play a role in decarbonizing energy. Expectations are high as it extends a lifeline to the unsustainable energy systems existing today. However, to combat the climate crisis, the political priority must be to reduce emissions today, which requires systemic change. Existing carbon policies need to be enforced more rigorously, for example, by setting carbon prices high enough to make a difference. There needs to be higher political accountability and a change in mindsets so that the socio-economic system can be reoriented towards sustainability. Techno-optimists' trust in CCS and other innovations inhibits climate action today. If a breakthrough in CCS materializes, all the better. But we must be prepared if it doesn't.

*This paper was edited by Nuur Mazjoub and the Short Paper management team.*

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