

Get Out of Jail Free Card: Carbon Capture

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I am minimizing Communications, so that I can (really!) finish *Sophie's Planet*, while also providing expert testimony for several lawsuits aimed at using the judicial branch of government to force the other branches of government to do their job. However, there is enough popular misinterpretation of recent news about the cost of carbon capture that I should comment on that.

David Keith has done some of the most credible work on direct air capture of CO₂, so his recent paper¹ in *Joule* reporting on the cost of carbon capture deserves attention. Media reports emphasized that these reported costs were lower than costs estimated in a report by the American Physical Society (APS) in 2011. This caused some people to believe that we may be on the way to a “get out of jail free” card, the hope of many that technology will come to the rescue, so we do not need to be so concerned about the mess we are leaving for young people.

Unfortunately, the new news on carbon capture costs provides no support for the notion that we can solve the climate problem without fossil fuel phase-out. On the contrary, the Keith et al. study reinforces our concerns.

Many people failed to notice the matter of units. Keith reports a cost of \$113-232 per ton of CO₂ for plant designs in which the resulting CO₂ is ready for sequestration. The cost per ton of carbon (tC) is higher by the factor 44/12. So the reported cost is \$414-850/tC.

Furthermore, none of the four cases include the cost of carbon storage! According to the 2015 National Academy of Sciences report on CO₂ removal² the costs of geological sequestration are \$37-73/tC. So the total costs for capture plus storage would be \$451-923/tC.

Note that we used the cost range \$113-232/tCO₂ from the Keith paper. They also give a cost range \$94-232/tCO₂, which is what the media picked up on. However, the \$94 case has the CO₂ being used to make a liquid fuel that, when burned, puts the CO₂ back in the air! So there is no negative emission. In fact, that total process would have positive emissions, at least to some degree.

In *Young People's Burden* we were aware that the cost estimates from the APS study were high. Based on many studies referenced in our paper, we chose \$150-350/tC as an optimistic estimate of the potential future cost. The low end of the cost range \$451-923/tC based on Keith et al. is about 30% higher than the upper end of our range!

In *Young People's Burden* we show that even our very optimistic cost of carbon capture results in an unbearable debt for young people, if high emissions continue unabated. The new estimates only reaffirm that conclusion. There is no prospect for a Get-Out-of-Jail-Free card.

One of the legal cases³ now underway is an effort to block the Trump government from opening up a huge new area of coal mining in Montana. The total coal resources in the basin in question are twice the quantity produced in the entire U.S. since 1949! Burning even a fraction of these resources would leave an astronomical cost for young people, as I show in the [linked](#) declaration I submitted to support the case against expanding that mining. It makes no sense to exploit these resources, serving only to enrich a handful of people. Most of the coal would be shipped to the Far East, but, in the end, I do not believe that the United States can escape either the moral or legal

¹ Keith, D.W., et al.: A process for capturing CO₂ from the atmosphere, *Joule*, 2, 1-22, 2018.

² National Academy of Sciences: Climate Intervention: Carbon Dioxide Removal and Reliable Sequestration, Washington, D.C., 154 pp., <https://doi.org/10.17226/18805>, 2015.

³ Montana Environmental Information Center v. U.S. Office of Surface Mining and Signal Peak Energy, LLC. Doc. 86.

obligations from such a willful disregard of the consequences for young people. It makes no sense to approve such expansion of coal mining, and I believe that chances of blocking that expansion are good.

I have a new assistant, Eunbi Jeong <ej2347@columbia.edu>, replacing Nicole. If you are interested and able to support our work at Climate Science, Awareness and Solutions, you can contact Eunbi.