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 the recent news on the cost of carbon capture that I should comment on that. Carbon capture and storage would provide the proverbial "get out of jail free" card for fossil fuel burning, if the cost could be brought down far enough.

David Keith has done some of the most credible work on direct air capture of CO_2, so his recent paper[1] in Joule reporting on the cost of carbon capture deserves attention. The media reports emphasized that these reported costs were lower than costs estimated in a report by the American Physical Society in 2011. This caused a number of people to believe that we may be on the way to "get out of jail free," 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 to deal with.

Unfortunately, this new news on carbon capture costs only reinforces our concerns.

Many people failed to notice the matter of units. Keith reports a cost of $113-232 per ton of CO_2.for plant designs in which the resulting CO_2 gets sequestered The cost per ton of carbon is higher by the factor 44/12. So the reported cost is $414-850 per ton of carbon (tC).

In *Young People's Burden* we were aware that the cost estimates from the APS study were high. Based on many studies referenced in that paper, we chose $150-350/tC as an optimistic estimate of the future cost. The low end of Keith's cost range is almost 20% higher than the upper end of our range!

Note that we used the cost range $113-232/tC from the Keith paper. They also give a cost range $94-232/tC, which is what the media picked up on. However, the $94 case did not include the cost of carbon storage! Instead that case has the CO_2 being used to make a liquid fuel that, when burned, puts the CO_2 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 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 cases[2] 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 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.

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[1] Keith, D.W., et al.: A process for capturing CO_2 from the atmosphere, Joule, 2, 1-22, 2018.

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