Environmental Justice Australia

13 March 2018

Environmental Justice Australia Submission

Clean Energy Finance Corporation Amendment (Carbon Capture and Storage) Bill 2017

1. Environmental Justice Australia is a not-for-profit legal practice. We welcome the opportunity to make this submission on the *Clean Energy Finance Corporation Amendment (Carbon Capture and Storage) Bill 2017* (the **Bill**).

2. We submit that the Committee should not recommend the Bill due to the material uncertainties around the future success and health impacts of carbon capture and storage (**CCS**) technology.

3. CCS has so far failed to deliver on its potential to reduce future carbon dioxide emissions into the atmosphere. It is not a proven technology. Sufficient doubt exists about the environmental and economic risks associated with this technology such that CCS should not be considered 'clean energy' and investing in it would not amount to a proper use of government resources.

4. In 2005 the Inter-governmental Panel on Climate Change (**IPCC**) published its Special Report on CCS.[1] It referred to an earlier 2000 IPCC report, the IPCC Special Report on Emissions Scenarios. The IPCC's 2000 range of emissions reduction scenarios foresaw 9-12% of global emissions by 2020, or 2.6 to 4.9 $GtCO_2$, abated by CCS.[2] As we approach 2020, the world does not speak of percentage of global emissions captured by CCS. Rather, CCS proponents cite the handful of CCS projects that might be successful, yet still have the potential to fail.

5. The IEA, whose advice is cited in the Explanatory Memorandum to the Bill as justification for CCS investment by CEFC, cites only two apparently successful CCS projects in its *2017 World Economic Outlook*. The IEA proceeds with a salutatory warning:

> *Yet, overall, the global portfolio of CCS projects is not expanding at anything like the rate that would be needed to meet long-term climate goals. The decision in June 2017 to suspend start-up activities for the Kemper gasification system in the United States, due to the project's economics, is a reminder of the challenges that first-of-a-kind technology faces.*[3]

6. Proponents of the Bill may argue that this is all the more reason to fund CCS. However, an untested technology should not be seriously considered as a sound option to reduce carbon emissions, let alone by a government body with capital return requirements.

7. Kevin Andrews and Glen Peters 2016 *Science* journal article *The trouble with negative emissions: Reliance on negative-emission concepts locks in humankind's carbon addiction* says in reference to CCS:

[1] https://www.ipcc.ch/pdf/special-reports/srccs/srccs_wholereport.pdf
[2] Page 24
[3] International Energy Agency, World Economic Outlook 2017, p 61

Environmental Justice Australia
ABN 74052124375

PO Box 12123
A'Beckett Street PO
Melbourne VIC 8006
L3, 60 Leicester St, Carlton

F (03) 8341 3111
E admin@envirojustice.org.au
W www.envirojustice.org.au

> *Two decades of research and pilot plants have struggled to demonstrate the technical and economic viability of power generation with CCS, even when combusting relatively homogenous fossil fuels.*

8. In our view Andrews and Peters' concern about negative emission technologies applies to CCS, in that:

   - the promise of CCS is more appealing than the prospect of developing policies to deliver rapid and deep mitigation now;
   - CCS is not an insurance policy, but rather an unjust and high-stakes gamble;
   - there is a real risk CCS will be unable to deliver on the scale of its promise;
   - if the emphasis on equity and risk aversion embodied in the Paris Agreement have traction then CCS should not be a significant contributor to the mitigation agenda.[4]

9. The economics behind CCS and why CEFC funding will not make any difference to curtailing emissions is explained by Howard Herzog, a senior research engineer and carbon capture expert at Massachusetts Institute of Technology:[5]

> *Because it's more expensive to produce energy with carbon capture than without it, there's little incentive for the private sector to invest in the technology without a more aggressive policy push toward curtailing emissions, he pointed out. A carbon price, for instance, would be one way of creating a market for the technology.*

How successful have CCS projects been?

10. Like the Kemper facility in the US, the Boundary Dam CCS plant in Saskatchewan, Canada is a prime example of a novel large scale CSS project encountering operational and cost issues. It reportedly captured half or less of the promised level of CO_2 captured, was subject to considerable cost overruns, and faced multi-million dollar payouts for failure to deliver upon contractual terms.[6]

11. Moreover, many CCS projects across the globe have been stalled or cancelled altogether. On two occasions, the US government initially committed to investing in the 'FutureGen' CCS project and later pulled out given the high costs involved.[7] In the UK, the government has twice run competitions to support the development of large scale CCS projects. The first competition was cancelled, while the second competition lost its funding. The reasons behind the failure of these CCS initiatives included the high cost to consumers, the overall cost inefficiency of CCS technology, and the fact that the money could be better spent elsewhere. By the time the competitions were cancelled, the UK government had already spent approximately 168 million pounds (A$215 million) on the competitions, with an independent auditor coming to the obvious conclusion that the projects had not achieved value for money.[8] The Department itself admitted that in order for CCS technology to fulfil its supposed potential of contributing to decarbonisation, the implementation costs would have to decrease.[9]

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[4] http://smartstones.nl/wp-content/uploads/2016/12/Kevin-Anderson-2016.10.13-the-Trouble-with-Negative-Emissions-Science-2016.pdf
[5] https://www.washingtonpost.com/news/energy-environment/wp/2016/10/13/were-placing-far-too-much-hope-in-pulling-carbon-dioxide-out-of-the-air-scientists-warn/
[6] http://reneweconomy.com.au/the-fallout-from-saskpowers-boundary-dam-ccs-debacle-54803/
[7] https://www.nature.com/news/us-government-abandons-carbon-capture-demonstration-1.16868
[8] www.nao.org.uk/wp-content/uploads/2017/01/Carbon-Capture-and-Storage-the-second-competition-for-government-support.pdf; p.4, 11
[9] www.nao.org.uk/wp-content/uploads/2017/01/Carbon-Capture-and-Storage-the-second-competition-for-government-support.pdf

12. The numerous instances of delayed or failed CCS projects are indicative of the reality that the implementation of such technology is in most cases too resource-intensive. Indeed, groups like CO2CR's own report estimates CCS retrofits for coal-fired power stations and anywhere between $1.45 - $2.45 billion *per unit*.[10] The extent of this outlay does not correspond to the proposed benefits of CCS technology in contributing to climate change mitigation, which are at best tenuous.

What has been attempted in Australia?

13. In 2009, the Australian government proposed a CCS flagship program worth $1.9 billion. The sole yield of the program was to be two to four large CCS projects. However, the program has since been scaled back to under $300 million, with a focus on exploring CO_2 storage sites in Victoria, Queensland and Western Australia. This downsizing is in line with global trends of investment into CCS technology, as it becomes increasingly apparent to governments that CCS is not an economically viable, nor an environmentally appropriate pathway to scaled emissions reductions.

14. The Australian National Audit Office reviewed the program and found that none of the CCS flagship projects met the original timeframe or reached the stage of deployable technology as originally envisaged in the program design.[11] There is no evidence to suggest that a different outcome would occur as a result of CEFC support for CCS projects.

15. In Queensland, the state government abandoned a $4.3 billion CCS project to retrofit Stanwell power station in 2010 that was originally initiated in conjunction with private operators and the federal government.

Why is it not a solution to reaching Paris target or transitioning to renewables?

16. Under the Paris Agreement, Australia has committed to reducing emissions by 26 -28% below 2005 levels by 2030 in its National Determined Contributions.[12] The aggregate global NDCs are not sufficient to meet the climate goals of the Paris Agreement so countries seriously ratchet up emissions reduction goals.

17. The IEA itself reveals that Australia's NDC target is unlikely to be met under our government's current policies relating to emissions reduction.[13] The Bill's supporters might argue that if the government is to honour its commitment under the Paris agreement, further policy action must be taken with respect to CCS. However, relying on CCS technology as a strategy for emissions reduction is, we submit, both impractical and misguided.

18. Even if CCS was deemed successful in the short-term and could be employed economically and at scale, in the event of a leak from a CCS facility, the addition of significant quantities CO_2 would be released at a time where it would be too late to reverse or even halt the severe ramifications of climate change.[14] Thus, relying on CCS as the way to reduce our emissions and meet our commitment under the Paris Agreement is an imprudent strategy.

[10] Retrofit CCS report ,p v
[11] https://www.anao.gov.au/work/performance-audit/low-emissions-technologies-fossil-fuels
[12] http://www.environment.gov.au/climate-change/government/australias-emissions-reduction-target
[13] Energy Policies of IEA Countries Australia 2018 Review, P.191
[14] Appendix C to 'The Sky's Limit' 2016 Report

19. To date, the Australian government has spent over $580 million on investigating the viability of CCS technology with little to show for it. [15] Moreover, research has shown that a power plant fitted with CCS would attract costs equivalent to two regular coal power plants.[16]

Health impacts

20. Too many uncertainties surrounding the environmental impact of CCS technology exist for CCS to be considered 'clean energy', a necessity for the CEFC. The European Environment Agency in the publication *Air pollution impacts from carbon capture and storage (CCS)* recognises leakage, or the re-emission of transported and CO_2, as the main concern in relation to environment and safety associated with the implementation of CCS. Emissions from CCS processes will increase emissions from energy production by 10% to 25%. Leakage and increased emissions can have adverse impacts on human health. A concentration of 10% CO_2 in the air is assumed to be fatal for an exposed population. Increased levels of air pollutant emissions (eg NOx, SO_2 and NH_3) that can occur because of the combustion of additional fossil fuels required for CCS processes "may lead to additional localised impacts on health, crops and materials and to acidification and eutrophication."[17]

21. Enabling the CEFC to provide funding for CCS is, in our view, at best a diversion from real climate change policy. Potential CEFC funding facilitates locking in high-emissions technologies with no real prospect of emissions reductions at scale.

22. It follows that CEFC funding can be considered an effective subsidy to fossil fuel industries in circumstances where current subsidies are linked to disproportionate to impacts on health. Relevantly, the Health and Environment Alliance report *Hidden Price Tags* calculated health costs from fossil fuels in Australia was $8.39 billion whilst fossil fuel subsidies were in the order of $5.3 billion. Other costs to society from Australian fossil fuel extraction was calculated to be $17.6 billion.[18]

23. Enabling emissions by the burning of fossil fuels resulting from CEFC promise to fund CCS is inequitable, uneconomic and not in the national interest. The Committee should not recommend the Bill.

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[15] Mission Innovation (2017), "Australia: Support for low emissions technologies and carbon capture and storage" http://mission-innovation.net/participating-countries/australia/ (accessed 7 July 2017). In Energy Policies of IEA Countries Australia 2018 Review, P.118
[16] http://www.abc.net.au/news/2017-06-15/clean-coal-will-not-work-industry-insider/8618836
[17] www.eea.europa.eu/publications/carbon-capture-and-storage/download p24
[18] http://env-health.org/IMG/pdf/healthandenvironmentalliance_hidden_price_tags_report.pdf p52