Greenpeace Submission to the Senate Inquiry into the Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008 & 3 related bills

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Greenpeace Australia Pacific is submitting the report: *False Hope, why carbon capture and storage won't save the climate* to the Senate Inquiry into the Offshore Petroleum Amendment (Greenhouse Gas Storage) Bill 2008 & 3 related bills. This letter covers the more salient points made in *False Hope* and explains why investigating the proposition of CO_2 storage, whether on- or off-shore is a ridiculous notion and a complete waste of the Senate's time.

It should be worth noting that the report: *Energy [R]evolution, A Sustainable Australia energy outlook*, referenced several times in this submission, was tabled in the Senate by former Senator Lyn Alison on the 23rd June, 2008. Greenpeace will also submit *Energy [R]evolution* as supplementary to this submission, for ease of reference.

False Hope is a detailed review of the literature surrounding Carbon Capture and Storage and explains the myriad of reasons why CCS is a dangerous distraction from undertaking real action on reducing greenhouse gas emissions from the energy sector. Most notably, there are serious issues concerning:

- Timeliness: *False Hope* cites the World Business Council for Sustainable Development, who estimate that CCS will not be commercially viable until at least 2030, a timeframe that matches the expectations for clean coal under the government's national clean coal initiative[1]. By 2030, massive cuts in greenhouse emissions will need to have been made such that the energy sector will have been transformed without CCS, or we will have failed in our attempts to prevent runaway climate change. The *Energy [R]evolution: A Sustainable Australia Outlook*[2] report demonstrates that coal-fired electricity generation could easily be phased out in Australia by the year 2030, rendering this technology – and associated regulatory frameworks – irrelevant.

  Current projects underway by the CO2CRC are apt demonstrations of just how far away commercially viable CCS is. The $40 million storage trial in the Otways intends to store 100,000 tonnes of CO_2 over two years. In comparison, a power station such as Loy Yang emits approximately 250 times more CO_2 annually. Loy Yang also is the site of a trial which hopes to capture 10,000 tonnes of CO_2, meaning the project would require scaling up by a factor of more than 1,000 if it could be applied to the maximum 85% of emissions from Loy Yang.

- CCS wastes energy: *False Hope* reports that between 10-40% of a CCS power station's capacity would be required to operate the CCS technology and process. The *Energy [R]evolution* report demonstrates that electricity demand in Australia can fall by 10% between 2005 and 2020 by implementing energy efficiency measures, not only saving emissions from fossil fuel combustion, but associated mining and transport. CCS would further fuel the coal addiction, resulting in more mining and transport, which themselves generate substantial greenhouse gas emissions. Even with a middle of the range energy penalty of 20%, an additional power station would

[1] http://www.alp.org.au/download/now/new_directions_for_australias_coal_industry.pdf
[2] http://www.energyblueprint.info/australia.0.html

need to be built for every four operating with CCS, simply to maintain overall energy supply.

- Expense: *False Hope* cites US Department of Energy figures that show how CCS would lead to a doubling of coal-fired plant costs. The resultant impact on electricity prices would be an increase of between 21-91%. Taking into account all of the stages of capture, transport, storage and monitoring, the cost of applying CCS to a power station the size of Yallourn would be up to AUD$1.36 billion per year[3]. It is hard to conceive that off-shore storage costs would not be higher than onshore sites.

- Liability: For CCS to be safely applicable, storage must be guaranteed and the CO_2 must remain underground for an indefinite period. Even slow, gradual leakage would undermine the purpose of storage in the first place, as the CO_2 will end up back in the atmosphere where it will continue to drive climate change. Sudden leakage will cause the same problem, but add the hazard of creating a noxious and life-threatening atmosphere. The CO_2 leakage event at Lake Nyos in Africa asphyxiated thousands of people and livestock, as a mass of CO_2 rose to the surface from beneath a lake and spread across a wide region. Other liability risks include the potential for CO_2 to contaminate groundwater and possibly drinking water sites, ecosystem damage (e.g. acidification of sea-water) and the lubrication of geological formations, potentially leading to geological disruption. So far, industry has viewed liability as a barrier to wider deployment of CCS and has only accepted liability over timescales of years, rather than the indefinite period CO_2 must remain underground to be safe. This is essentially a vote of no confidence in CCS from the industry itself. However, those hoping to profit from the application of CCS processes *must* be permanently responsible for the impacts of storing CO_2, a hazardous waste product, underground.

- Limitations and risk of storage: A major limitation on the applicability of CCS is the fact that storage sites both globally and within Australia are extremely limited. *False Hope* reports that for CCS to deliver any meaningful climate change mitigation by 2050, 6000 projects injecting 1 million tonnes of CO_2 per year would be required. Currently, it is unclear as to whether there is even be enough available storage sites located close enough to power stations to facilitate this level of storage. The CSIRO has indicated that transport of CO_2 more than 100km from power plant to storage site would make it prohibitively expensive. This effectively rules out the NSW power sector, as there are no potentially suitable sites within 500km of power stations that supply the Newcastle-Sydney-Wollongong region[4]. Already in Australia, a $2 billion project has been cancelled as the identified site was found to be unsuitable[5].

Crucially, action can be taken to reduce greenhouse gas emissions in the energy sector long before CCS would ever be able to make a dent in emissions. The *Energy [R]evolution* report shows how, by 2020, a combination of energy efficiency, renewable energy and the use of gas as an interim fuel can achieve reductions of 37% in greenhouse gas emissions from current levels by 2020, a 66% reduction from business as usual. Making such strident reductions whilst still a decade away from seeing CCS as a commercial reality suggests that

[3] Based on an estimate of 14 million metric tonnes per year and an exchange rate of AUD$1 = US$0.94

[4] Saddler, Reidy, Passey (2004), Geosequestration – *What is it and how much can it contribute to a sustainable energy policy for Australia*?, The Australia Institute

[5] http://www.bloomberg.com/apps/news?pid=20601081&sid=ag.zXqGzi22g&refer=australia

we can use cheaper, cleaner and vastly more cost-effective measures transition away from coal-fired electricity towards an economy powered by renewable energy.

Essentially, CCS is an unnecessary, risky, unlikely, unreliable and expensive distraction from taking an expedient path to a low-carbon future. For this reason, Greenpeace contends that the process of establishing legislation to allow for offshore storage of CO_2 is illogical, as it is establishing a framework for a process that is unlikely to assist in reducing greenhouse gas emissions. However, Greenpeace would like to point out several elements of the legislation that it finds particularly egregious:

- The regulation deals with CO_2, but not other substances, such as brines or below sea-bed methane, which may be displaced by CO_2 injection. The aggravation of brines is potentially damaging for aquatic ecosystems, particularly costal regions, where ecosystems are often more fragile and diverse. The potential impacts of substance migration and associated liability should be taken into account within this legislation.

- The legislation appears geared towards encouraging further oil and gas exploration, something that is inconsistent with responsible climate change policy. Permits for CCS will only be given if there are no adverse effects for oil and gas exploration, however not necessarily if there are adverse environmental impacts. It is unacceptable that environmental impacts are not a key factor in determining licence application.

- The possibility that competition over site storage can be resolved by awarding the license to the operator who intends to store the most CO_2 is an extremely dangerous approach. CO_2 storage sites are finite in their capacity; it makes no sense to award licenses to operators on the basis that they hope to store the most CO_2 at a site. A more appropriate measure to apply in resolving competition over site access would be to seek the most stringent monitoring methods and liability adopted by the operator.

- In division 5, it is concerning that only the leakage of the greenhouse gas injected substance (i.e. CO_2) is dealt with. There are likely to be a number of other substances displaced by the process of storage, such as methane from sub-soil, which may be released and should also be considered

- On page 202, it appears that the legislation is setting up the Commonwealth (and therefore the Australian tax payer) for long-term monitoring and liability of stored CO_2. The legislation proposes that the applicant provides suggestions to the Commonwealth, after the license is issued, as to how monitoring of CO_2 may take place. This effectively transfers responsibility and liability to the Commonwealth. This is unacceptable, as the agent responsible for storing the CO_2 must be responsible for its long-term monitoring and liable for any adverse environmental impacts, including failure of the site to effectively store the CO_2. There are potentially many other industries at stake from environmental harm or failure of CCS (e.g. fisheries, tourism…), which may suffer losses in the event that CO_2 storage site fails. Although the legislation suggests that costs of monitoring by the Commonwealth may be recoverable, the responsibility and cost should always remain in the hands of those responsible for storing the CO_2.

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- If CCS projects were to proceed, project reports must be made publicly available, and not merely remain the property of the “authority”. Full transparency is essential, given the risky nature of undertaking CCS. Information should be disclosed in full about the application, proposal, operation and monitoring of any CCS project, and be placed on the public record.

In general, Greenpeace Australia Pacific is concerned that a range of elements in this draft legislation allow for offshore CCS to proceed without operators being held fully accountable for their actions. Further, this legislation appears little more than an additional means for oil and gas companies to seek out further sites for fossil fuel project development, thereby undermining the original rationale of CCS projects.

At this stage of the climate change debate and given the current status of CCS technology and the benefits, or not, that the technology can deliver to emission reductions globally, Greenpeace Australia Pacific recommends offshore and onshore carbon storage is prohibited.

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