

Environment and Public Affairs Committee

From: Angus King <vice-chair@sen.asn.au>
Sent: Friday, 20 September 2013 11:31 AM
To: Environment and Public Affairs Committee
Subject: SEN Submission to the Inquiry into the Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas
Attachments: SEN Doc Fracking Submission.pdf

Honourable Members

Please find attached Sustainable Energy Now's (SEN'S) submission to the "Inquiry into the Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas". SEN is a grass roots organisation that aims to demonstrate scenarios for Western Australia to reduce CO2 emissions and pollution in fixed electricity generation, by maximising our use of sustainable energy.

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Kind regards
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Submission Concerning the Impacts of Hydraulic Fracturing in Western Australia

Sustainable Energy Now (SEN) is pleased to make comment on this important topic and hereby submits that the use of hydraulic fracturing for unconventional gas within Western Australia is an ill-advised, dangerous and unnecessary direction for our energy future.

Sustainable Energy Now is a grass roots organisation that aims to demonstrate scenarios for Western Australia to reduce CO2 emissions and pollution in fixed electricity generation, by maximising our use of sustainable energy. Our volunteers come from a range of backgrounds, including renewable energy, physics, geophysics, computer programming and IT, graphic design, computer simulation and engineering.

SEN calls for the Environment and Public Affairs Committee to broaden the terms of reference of the inquiry, thereby the numerous related concerns and alternatives regarding the industry.

Furthermore, SEN considers the use of Fracking to be hazardous to human health and a burden of our precious resources such as water. Finally, SEN believes that future Western Australian energy demand can be met comfortably, economically and sustainably using renewable energy generation.



Broaden the Terms of Reference

The current scope of the inquiry is inadequate. In order for the inquiry to fully investigate the risks associated with the unconventional gas industry, the inquiry's terms of reference must be expanded to include concerns regarding human health and its impacts on the unique Western Australian environment.

The following is a non-exhaustive list of issues and explanations that SEN believes are critical in forming a holistic perspective on unconventional gas:

1. First and foremost, the Terms of Reference have not established the need for Fracking within WA.
 - a. Sustainable Energy Now have conducted extensive research into the power requirements of Perth's South West Interconnected System (SWIS) Energy Grid and concluded that the entire system is able to be converted to renewable energy, safely, affordably and sustainably by the year 2029 ^[1].
 - b. Whilst the AETA BREE report clearly demonstrates that the Australian market is ready for renewables on a nationwide scale ^[2].
 - c. As renewable technologies continue to drop in price, the market for cheap gas generation will be unable to compete economically with renewables. According to the chief executive of Bloomberg New Energy Finance, Michael Liebreich, the fact that wind power can now compete economically in a fossil rich country such as Australia is a "game changer". The Bloomberg analysis concludes that the Australian economy is likely to be powered extensively by renewable energy into the future ^[3].
 - d. Furthermore, we already have the skills, resources and capability to make Western Australia a global example of a functioning low carbon economy.

2. Secondly, SEN is concerned that air pollution is not covered within the current inquiry:
 - a. Air pollution is an inevitable by-product of fracking operations. The European Commission report by Dr Mark Broomfield, 2012, concluded that there is a cumulatively high risk of air pollution ^[4].
 - b. This coupled with the fact that the industry is looking to develop in areas surrounding regional towns and on farmland will result in significant numbers of people being exposed to unnecessary health risks. Exposure to air pollution resulting from unconventional gas fracking has been documented to increase the risk of cancers (particularly leukaemia), neurological diseases, impacts to the nervous system, asthma, along with plethora of other undesirable health effects ^[5]. Conclusions from the literature assert the need for further health impact assessments before allowing the unconventional gas industry to continue development ^[6].
 - c. SEN firmly believes that the benefits associated with Western Australia adopting renewable energy generation far outweigh any gains unconventional gas is purported to offer and would come without the accompanying health risks.



3. The terms of reference for the inquiry should also be expanded to capture the effects of dangerous climate change stemming from unconventional gas.
 - a. The argument that fracking is a “clean” fuel is based upon selective accounting. The industry often promotes its natural gas as a bridging fuel that will displace coal and reduce the greenhouse gas emissions of future energy generation. Whilst it is true that the burning of natural gas produces less greenhouse gases than coal, there is mounting evidence that over the life cycle of a fracking operation its climate change forcing is on par, if not worse, than coal ^[7]. In addition, greenhouse gas emissions from unconventional gas supply can be significantly higher than from conventional gas supply ^[8]. This is partly due to significant releases of methane, in the form of fugitive emissions, which have a greater impact on global warming than carbon dioxide ^[9].
 - b. Western Australia’s gas reserves are globally significant. Recent estimates suggest that there is approximately 300 Trillion Cubic Feet of gas beneath the Kimberley alone. Our role as a major worldwide gas exporter places a heavy responsibility on Australia to consider the effects that burning such vast amounts of gas will have on our atmosphere.
 - c. Another notable part of Hardisty’s (2012) report clearly illustrates that considerably greater savings of greenhouse gas emissions could be gained by simply adopting renewable energy sources. Wind, for example, only emits roughly 5% of the greenhouse gas per joule of energy. SEN is concerned that West Australia’s interest in unconventional gas is likely to impede the implementation of truly clean renewable sources of energy.



Terms of Reference

Term of Reference 3 - The use of ground water in the hydraulic fracturing process and the potential for recycling of ground water:

Even using the conservative estimates by the Department of Mines and Petroleum WA (DMP) regarding water usage, SEN believes that fracking is an unacceptable waste of this critical Western Australian resource.

The DMP asserts that approximately 5 million litres of water will be used for each fracking operation; this value does not include the original 4 million litres required to drill the well. Bearing in mind the States proposal to have over 100 000 wells in the Kimberley, along with further 25,000 wells in the Mid-West; 1.125 Trillion Litres of water is not a trivial amount.

To put this in perspective, Perth's entire metropolitan region storage capacity in its dams is 605 Billion Litres ^[10]. Yet, our yearly average sits at approximately 30% and is falling. The Water Corporation's "Water Forever 50 Year Plan" ^[11] confirms that dams will be considered an infeasible part of Western Australia's water supply due to threats such as increased population and decreased rainfall. The kind of water use required for unconventional gas operation will further deplete our aquifers and is a burden that our already straining water table cannot afford.

It should be noted that alternative energy solutions such as wind or concentrated solar thermal work in harmony with nature and do not require a continuous and extensive waste of our precious natural resources.

Term of Reference 2 - The regulation of chemicals used in the hydraulic fracturing process:

Fracking does not just threaten West Australian water reserves with depletion; it also carries the threat of ground water contamination and surface water pollution.

A report by the European Commission in 2012 concerning the risks associated with unconventional gas fracking concluded that there was a high risk of ground water contamination ^[4]. The information supplied by the DMP details that the majority of fluid pumped underground is a mixture of water and sand whilst approximately 0.5% is a mixture of chemicals known as 'slick water'. The chemical make-up of slick water includes known toxic, mutagenic, allergenic, and, carcinogenic substances ^[5]. Should 1.125 Trillion litres of water be pumped underground then it follows that over 50 Billion litres of unnatural chemicals will be required.

Many of these chemicals, along with those that naturally occur in the shale itself are then returned to the surface and placed in holding ponds. Amongst those potentially returned are dangerous substances such as arsenic, benzene, mercury and naturally occurring radioactive materials. A study by M Bamberger and R Oswald determined that the concentrations of these chemicals are high enough to be toxic to humans and animals. Furthermore, they liken the actions of unconventional gas companies to the tobacco industry. By stating that they will continue operations until it can be



proved conclusively that fracking is accompanied by a dangerous risk to human health; fracking companies run the risk of causing similar, devastating and long-lasting effects on public health ^[12].

Pollution of ground water can occur through a myriad of different ways, from catastrophic well failure to slower acting corrosion failures. Operator wide statistics from Pennsylvania determine that even new wells drilled within the past three years have a sustained failure rate of around 6-7% ^[13]. Should these statistics ring true for the complete build out of Western Australia's 100 000 plus planned wells, then one could expect that around 10 000 wells would have a compromised structural integrity, and potentially cause irreversible damage to our aquifers. SEN concedes that whilst many of the risks concerning ground water pollution can be reduced by best practice; the prevalence of well failures in Pennsylvania, a significantly more established industry than Australia, demonstrates that they will never be completely mitigated.

Due to the construction of the plastic lined chemical/waste-water holding ponds, these ponds are particularly vulnerable to tears in the lining, flooding and accidental spills. Cases have been observed in Wisconsin, America, where heavy downpours have caused flooding and/or breaches compromising the safety of the surface water surrounding several well locations ^[14]. The problems develop when the industry is rushed into production, causing inexperienced companies to underestimate the design requirements of each well's waste products and environmental conditions. Should Western Australia allow the development of unconventional gas to continue unabated, we can expect the same hazardous risks to our surface water.



Conclusion

First and foremost, SEN calls for the Environment and Public Affairs Committee to broaden the Terms of Reference for the inquiry. This will ensure it is able to capture the full concerns related to unconventional gas and explore alternatives for our energy future.

SEN calls for the inquiry to place a full moratorium on all fracking activities until a more comprehensive enquiry has been conducted into the cumulative risks that the shale gas industry poses the unique Western Australian environment and our public health. Until the government can guarantee protection of our groundwater, health, agriculture and environment, there should be no further push to develop gas fracturing in Western Australia.

Finally, SEN believes that the government should instead look to replace our dependence upon fossil fuels by diverting their attention from Fracking and instead investing in cleaner, sustainable forms of energy.



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