

Submission
No 376

INQUIRY INTO COAL SEAM GAS

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RISING TIDE SUBMISSION TO INQUIRY INTO COAL SEAM GAS

Rising tide is a collective of concerned citizens, based largely in the Hunter Valley. We act to reduce the detrimental effects of the root cause of climate change in our region - coal. We are also greatly concerned about the continued development of other sectors of the fossil fuel industry, including coal seam gas.

Coal Seam Gas (CSG) Mining has already been shown to be a great threat with direct detrimental effects taking toll on communities, agricultural land and the natural environment in NSW. It would be irresponsible of state legislators to allow the industry to continue full-steam ahead without extensive research on the impacts and strong regulation.

Industry consultation with public concerning the impacts of gas exploration, extraction, processing and transportation has, and continues to be a whitewash, designed to check all the boxes of government regulation without slowing the development process. Land holders, environmentalists and other concerned citizens investigate and report the possible damage taking place at their own costs.

The lack of governmental and independent inquiry into the impacts of coal seam gas mining thus far has allowed the industry to push destructively into NSW without comprehensive risk assessment processes. Strong regulation of the entire industry is urgently required, including independent monitoring of all projects currently under way.

We encourage the committee to gather, in addition to submissions, extensive and varied third party assessment and research findings to better gauge the range of impacts, current and ongoing of coal seam gas as an energy source. We encourage especially research in to the debatable concept of coal seam gas as a transition fuel. A range of alternative renewable energy technologies are already available and have a proven capacity, and are only waiting to receive investment from industry and support from government. Such renewable sources would lead to supplying cleaner, safer energy with far greater economical and social benefits at local levels than CSG is likely to (See especially the 'Zero Carbon Australia Stationary Energy Plan' developed by Beyond Zero Emissions, available at <http://beyondzeroemissions.org/zero-carbon-australia-2020>).

In addition, the principles of Ecological Sustainable Development should be applied to all coal seam gas projects and to the industry as a whole.

Coal seam gas mining in NSW is currently at an early stage of development. The detrimental impacts are already numerous. To allow its further expansion without rigorous assessment and risk management control, and stringent regulation, will ensure the amplification of negative impacts, resulting in great costs to communities, the environment and NSW economy. We believe coal seam gas carries too great a risk relative to its flaunted benefits and therefore should be banned or regulated out of existence.

Following is our detailed response to the terms of reference.

The environmental and health impact of CSG activities including the:

a. Effect on ground and surface water systems,

Aquifer geology is a relatively new science (as is geology in general). Our understanding of the connectedness of aquifers is limited at best. It is certainly probable that all Australian aquifers are connected to one another to some degree. The Precautionary Principle dictates that we should be extremely cautious in undertaking any activities that might damage even a small part of our aquifer system. Given our lack of understanding, risk estimates are potentially severely understated, even more so because the geologists conducting those assessments usually work in the industry, and so rely on its continuation for the security of their livelihood. The contention that CSG is able to contain damage to specific aquifers is unsupportable at any reasonably high degree of certainty.

Exploration licenses need legally binding requirements to not disturb aquifers in any significant way. Acceptable risk limits for potential damage caused by exploration bore holes must be legislated, and they must be at the low end of the error margin, as determined by the current state of the science.

The Great Artesian Basin (GAB) covers around half of Australia, and is for the most part uncharted. NSW gas projects could potentially have detrimental effects in distant areas of the basin. These effects could have impacts on many endangered ecological communities, and all of NSW's RAMSAR listed wetlands, in particular. Due to the connectedness of the GAB, these effects also have the potential to spill in to neighbouring states.

The Murray Darling system is already massively stressed, with water shortages, and broad scale salinity problems, affecting many endangered ecological communities (EECs), as well as agriculture, leading to knock on effects in society and the economy. Further damage to ground and surface water systems will only exacerbate these problems. Water extraction lowers water table, damages EECs, agriculture, changes PH, salinity. The Murray Darling water supply is already over allocated, and more CSG projects, which have significant water requirements, will push the system even closer to the edge. Some proposed water extraction processes (e.g. reverse osmosis), can be extremely energy intensive as well.

b. Effects related to the use of chemicals,

The chemical reactions between chemicals from the CSG mining process and the rock in varying geologies is largely unknown. There are potentially significant unseen problems that may be caused or catalysed by these processes many years down the track (Similar to the damage done to Sydney harbour in the late 19th century and early 20th centuries). Combinations of many dangerous chemicals are not equal to the sum of their parts – they can have complex and unpredictable properties. Once these chemicals are in there, they're in there for good. We can't reliably remove them once they are injected, and so we are committed to dealing with any unseen problems for generations. The Precautionary Principle must be applied here, along with the concept of Intergeneration Equity.

It is worth noting that Queensland legislators have banned some of the worst of these chemicals Benzene, Toluene, Ethylbenzene, and Xylene (BTEX), for the above reasons. Regardless of the ban, traces have been found in gas monitoring wells anyway. Other chemicals

used the the process do not have safety data available, and following the precautionary principle, must be assumed to have potentially damaging effects.

c. Effects related to hydraulic fracturing,

Fracking damages the geology supporting water tables and aquifers, leading to unpredictable effects, potentially including raising or lowering the water table, salinity problems, pH changes, etc. All of these problems have the potential to damage ecological communities, and agricultural viability of land. Fracking could potentially broaden, or open up new passage ways between aquifers, leading to changes in natural solute levels in groundwater and groundwater-fed surface water, potentially disrupting natural ecosystems.

CSG mining, especially the processes involving pressurising bedrock, can disturb the geology surrounding the project, which can catalyse earthquakes. Fracking has been shown to have a significant impact on the frequency of earthquakes in various states in the US, and has been banned in the UK at least partially for this reason.

d. Effect on Crown Lands including travelling stock routes and State forests,

Crown land is some of the most at-risk land in the state, as it has very little community oversight. It is not required that the community be notified of CSG projects on crown land, and this significantly increases the risk of problems with the development being overlooked during the approval process.

Crown land, including state forests, forms a significant part of the biodiversity corridor network. CSG and gas pipelines on crown land have the potential of significantly reducing the effectiveness of this network, by fragmenting it. Both CSG projects and gas pipelines require broad swathes of land in their near vicinity to be cleared for safety. This clearing disturbs corridors, and can also lead to increased risk of grass fire, which could be potentially catastrophic, when near gas infrastructure.

Clearing for CSG can also lead to increased erosion, which degrades land's biological and agricultural value, and reduces water quality.

e. Nature and effectiveness of remediation required under the Act,

Responsibilities for remediation requirements are placed on a company. Any company (especially small companies, such as single project operations) with such requirements can easily become insolvent, thus negating any requirements for rehabilitation, as responsibilities are dissolved along with the company. We need a better system for this. Responsibility for rehabilitation should be passed on to all shareholders at the time of the company collapse, in proportion to their holding. Otherwise we can have no guarantee that the rehabilitation will be carried out.

Remediation processes are not well defined under the act, for example, they have no consideration for biodiversity, aquifer stability, water quality, etc. Act calls for land degraded by petroleum mining to be "rehabilitated", but does not define the term, nor specify to what extent rehabilitation is required (recognising that rehabilitation cannot be 100% perfect). The

legislation must be amended to give these terms concrete definition, and to specify targets, or target ranges.

Rehabilitation of cultural sites is often impossible, especially for sacred sites, which may be considered desecrated for ever. Control over such sites should be handed over to their respective indigenous traditional owners.

f. Effect on greenhouse gas and other emissions,

CSG has massive greenhouse potential both from CO₂ emissions down stream (scope 3 emissions), and fugitive emissions of methane. In the past, greenhouse emissions from various projects have been whitewashed as insignificant on a global scale. But combined, such projects are *the main contributor to global greenhouse gas emissions*. Emissions from CSG must be considered industry-wide, as well as for each project. Project-specific emission calculations should be performed relative to their assumed benefit (e.g. Energy output, jobs).

Greenhouse effect-induced warming from carbon emissions from CSG projects will contribute to an increased likelihood of devastating drought, bush fires, extreme weather conditions (such as tropical cyclones and flooding), further damaging Australia's food security, and potentially causing further biodiversity loss. Equator-ward and upward shifting of climatic isoclines due to greenhouse warming is predicted to lead to increased risk of extinction of various Australian species, having unknown impacts on the ecological communities that they form part of. Fracturing of those communities is also likely due to differing rates of climatic migratory adaptation for different species.

These effects are all likely to be felt similarly in many other parts of the world. Massive damage to various at-risk global ecosystems is predicted, including such icons as the Great Barrier reef, the Arctic, and various low-lying tropical islands. These ecosystems provide the life support for many human cultures. Any damage to them will likely lead to massive economic flow-on effects from above stated immediate effects of climate change.

Globally, the effects of greenhouse warming are likely to lead to wide spread famine, displacement due to rising sea levels, and resource conflicts (e.g. Water-wars, like in Sudan). These knock-on effects are likely to lead to mass displacement of peoples from various global regions, causing a massive increase in global climate refugees. Given the current state of political fearmongering surrounding "boat people", it clearly must be in all Australian governments' interests to reduce the "push factor".

g. Relative air quality and environmental impacts compared to alternative fossil fuels.

This Term Of Reference is defined too narrowly. Consideration needs to be taken on the air quality and other environmental impacts of CSG *relative to all other potential energy sources*, for a given energy output, not just alternative fossil fuels. Wind, solar (photovoltaics and solar thermal), wave and geothermal all have far less impact on air quality.

While gas may have less dust impact than coal, it has the added detrimental effects of fugitive emissions of potentially dangerous chemicals, as well as the potential for flaring of excess by-products.

The economic and social implications of CSG activities including those which affect:

These Terms Of Reference do not include anything about the impacts on cultural heritage, and they probably should. Many regions that are opening up for exploration, such as the Pilliga, are full of indigenous cultural and sacred sites, and the impact of CSG on these sites as a whole must be considered.

a. Legal rights of property owners and property values,

Unrestricted access by mining companies is detrimental on land prices. Even the uncertainty of a potentially unused mining lease may degrade the price of land.

More importantly than price, the threat of CSG mining degrades the owner's ability to use the land to its full potential, either for agriculture, or for conservation purposes.

A Man's home is his castle. Lack of control over land can lead to depression and suicide, both of which are already rife in agricultural communities.

b. Food security and agricultural activity,

Massive impact on water resources, especially the great artesian basin, and potential pollution of soils leads to reduced or degraded agricultural output, resulting in reduced Australian food security. Global food shortages e.g. 2008, likely to be repeated. Australia has a responsibility to maintain its food security for the globe, as well as just for national reasons.

c. Regional development, investment and employment, and State competitiveness,

Due to automation of various parts of the process, CSG employs less people per unit energy than Coal over its life cycle. In contrast, wind farms, and other renewable energy projects can provide up to six times the number of permanent jobs than coal.

The above stated risks to agriculture could lead to a significant drop in employment in agricultural and related industries state-wide.

Fly-in-fly-out workers, common in mining industries, degrade communities, as they use the communities' facilities, but do not contribute to the community, as they know they will not be staying in the area to reap the benefits of their contributions.

Investment from overseas leads to overseas profits, and local communities see almost none of the profit. Royalties are so low that almost no benefit is felt state-wide, and due to other impacts, net benefit is negative.

d. Royalties payable to the State,

Royalties are laughably low, and nowhere near high enough to offset the damage caused to the state environmentally, agriculturally, socially and economically.

Royalties are short term gain, but the detrimental impacts of these projects are long term, and there is no responsibility for the corporations to follow up on rehabilitation (if such a thing can ever be completed anyway). A corporation can always become insolvent, at which point any responsibilities they signed up for are irrelevant, and rehabilitation work immediately comes to an end. Any royalties or taxes should be enough to cover the expected rehabilitation costs, so that this problem is overcome (e.g. Pigouvian taxes).

Communities have no control over the distribution of royalties, and see no recompense for their pain.

On top of all this, the CSG industry currently has a ridiculous 5-year exemption from paying royalties. This should cease immediately.

e. Local Government including provision of local/regional infrastructure and local planning control mechanisms.

Infrastructure for CSG (e.g. New roads) does not usually benefit the community, as they are project specific. The increase in use of existing infrastructure causes degradation, and maintenance must be funded by the state. This is yet another cost that royalties/taxes must cover.

The role of CSG in meeting the future energy needs of NSW including the:

a. Nature and extent of CSG demand and supply,

Most CSG development is for export, and so will have little or no impact on NSW energy security. Additionally, NSW has no need for gas as a stationary energy source – Australia is in a prime position to exploit various renewable energy sources, and all stationary energy requirements for NSW could be fulfilled by renewables, quickly, and without the need for “transition fuels” (See BZE report).

Demand for gas is partly driven by gas company advertising (i.e. That gas better than electricity for heating, cooking). Industry claims that gas is better than coal are green-wash, as they refuse to consider the possibility of a renewable-fed electricity grid for comparison.

Demand for CSG expansion is not from NSW requirements, but from shareholder profit requirements.

b. Relative whole-of-lifecycle emission intensity of CSG versus other energy sources,

CSG's lifecycle costs have been estimated as at least 120%, and possibly up to 200% of that of Coal.

Once GHG are in the atmosphere from the lithosphere, they cannot be removed except in the very long term (thousands or hundreds of thousands of years). Plant-based “offsets” remove

some carbon from the atmosphere, but are limited by other factors (nutrients and water), and they keep CO₂ in biosphere where it can quickly, and catastrophically be released (e.g. Intense forest fires, peat fires). Other technologies for returning carbon to the lithosphere, such as Carbon Capture and Storage (CCS) are unproven, and potentially extremely risky (e.g. Aquifer acidification).

c. Dependence of industry on CSG for non-energy needs (e.g. chemical manufacture),

The demand for gas from chemical and other industries is minimal, relative to use of gas for energy. This is not a demand that is driving the market for CSG. CSG industry is new in Australia, so existing industries cannot be already dependant on it, must have access to alternative sources. There is no need to develop CSG for these industries. With a bit of foresight, we could easily divert current gas usage from our stationary energy requirements to these industries, and use renewable energy sources for our stationary energy requirements.

d. Installed and availability costs of CSG versus other stationary energy sources,

When taking into account the true cost of carbon emissions (i.e. Economic impact of downstream greenhouse effects, etc.) and probable future carbon price, all fossil fuel sources, including CSG are likely to be far more expensive than renewable-based stationary energy sources. Even if they were cheaper, this would not be a valid excuse for destroying the planet for future generations.

e. Proportion of NSW energy needs which should be base load or peaking supply and the extent to which CSG is needed for that purpose,

Gas power plants currently being built, or currently proposed are mostly peaking plants, not base load, so this is a null point. Combinations of various renewable technologies can supply all of Australia's base load power, especially when combined with energy storage technologies (See BZE report).

f. Contribution of CSG to energy security and as a transport fuel.

CSG is not necessary for stationary energy security requirements (BZE). In the long term, it is less secure than renewables, which are indefinitely sustainable (it would be nice if this was considered a tautology), as CSG reserves in Australia are estimated at about 100 years worth, at current rates of extraction. But the industry is only in its infancy, so rates of extraction are likely to go through the roof, if the industry is allowed to expand. This will significantly reduce the estimated life of these reserves. Any assessment of the security of these reserves needs to take into account not only rates of extraction, but also the rate of increase in rates of extraction.

Transport fuel security is highly dependant on transport regimes, and can be influenced by future infrastructure developments. Integrated electric rail planning can reduce liquid transport fuel requirements. Any projections of the requirements for liquid fuels should include potential

changes in transport regimes that favour renewable-powered electric transport for both good and passengers.

The interaction of the Act with other legislation and regulations, including the Land Acquisition (Just Terms Compensation) Act 1991.

We are not lawyers, we do not have anything particular to add here. It might be worth noting that direct action on coal seam gas mining project has already been undertaken by citizens concerned about the environmental impacts, or about their land. These actions have resulted in arrests, and convictions (e.g. in Queensland, Tara blockade). If the industry expands, it will threaten more people and ecosystems, and is likely to face even more public resistance.

The impact similar industries have had in other jurisdictions.

Watch Gas Land.