



Coal Seam Gas: *a cleaner future?*

What is Coal Seam Gas?

Coal Seam Gas (CSG) is the name given to methane gas stores found in coal seams. These coal seams lie deep underground, and within them are ‘pores’ of gas held in place by large volumes of water. This gas can be mined and used as an energy source. Eastern Australia has very large reserves of coal seam gas, and the industry has experienced extremely rapid growth in the past decade—especially in Queensland. This rapid growth is causing increasing anxiety, as concerns are voiced regarding the unexplored consequences of CSG.

Is CSG a clean energy solution?

Coal seam gas will never be a “clean” energy source—merely somewhat cleaner than brown coal, as it produces less greenhouse gas. However, the “clean” promise of CSG has been thrown into doubt by recent inquiries, taking into account production and distribution as well as long-term environmental impacts. The information available on coal seam gas in Australia can be misleading as data regarding its outcomes has been largely moderated by mining companies. Even so, the industry itself admits that its carbon footprint—to drill the gas and turn it into liquid for export—is very emissions-intensive.

How is it extracted?

⇒ A mining company may first drill many ‘**test wells**’ deep into the Earth. These are unlikely to produce gas until the coal has been stimulated by hydraulic fracturing (*fracking*).

⇒ **Fracking** means pumping a fracturing liquid into coal seams at high pressure in order to crack open the rock, allowing gas to flow into the well. The fluid is composed of water, acids, hydrocarbons and other potentially toxic agents, and may later resurface as ‘flow-back water’.

⇒ To depressurise the coal seam and extract gas, **water is pumped out of the Earth**. This water is essentially brine: it is extremely saline, and may contain carcinogens and heavy metals. Substantial volumes of water are produced and must be transported from the site for disposal.

⇒ The extracted gas and water are separated. The salty water must be sent to treatment plants while the gas is dried, compressed and chilled into **liquefied natural gas (LNG)**. This is used for the production of electricity, for foreign export and domestic application.

⇒ If an area is found to be viable for CSG drilling, a mining company must apply for State Government permission to establish a site. To be economically practicable, they must plan for a **high number of wells**. In addition, the building of vast infrastructure such as water pipelines and treatment plants will infringe on the local environment.

Coal Seam Gas in Australia

Coal seam gas has emerged as a major industry in Australia, with billions of dollars poured into regional areas to mine the gas for export. The industry is most developed in Queensland, where 16.3 million tonnes of liquefied natural gas are expected to be exported in the years 2014-2015. Export of CSG will

certainly produce economic benefits, but at what cost to the Australian environment?

In 2012, the number of approved wells in Australia is over 2000. This figure

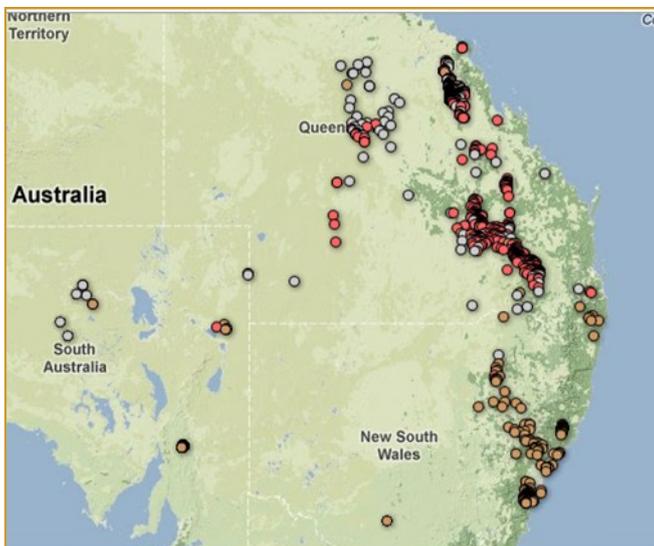
chiefly represents areas north-west of Brisbane like the Condamine River, home to an Australia's highest concentration of coal seam gas wells. One of the greatest issues facing communities like this one is the potential impact on their land, which also happens to be some of the most productive agricultural terrain in the country. The water taken from the coal

seam is toxic and must be handled with extreme care. The salt content can permanently ruin farming land, rendering it useless for agriculture. Vast quantities of water like this are regularly pumped out of coal seams and discharged into the Condamine River,

after being processed at water treatment plants to neutralise toxins. While the water is harmless for human use, it contains chemical waste at levels toxic to plants, animals and micro-organisms, having a potentially

catastrophic effect on the region's ecosystem. On top of this, mining companies have still not settled the question of how to dispose of the huge volumes of salt that accumulate as a result of the extraction process. The waste salt is liable to be disposed in landfill, and the ecological consequences of this are unknown.

*"Landholders and governments don't yet know the impact this will have. **It is the great coal seam gas experiment.**"*



*In 2012, there are **2374 coal seam gas wells** approved for Australian land. The majority of these are located west of Brisbane.*

- Proposed & production wells
- Plugged and abandoned wells
- Wells of unknown status

Map from ABC online.

www.abc.net.au/news/specials/coal-seam-gas-by-the-numbers/

Australia's ecosystem is a delicate one, with an unpredictable and at times tumultuous relationship to water. The rapidly expanding CSG industry represents a threat to the precarious balance of our river systems, farming land and the fresh water aquifers that supply our clean drinking water, raising huge concerns for the safety and stability of our environment.

Investigative reporters for the ABC have conducted a recent inquiry demonstrating that coal seam gas mining will result in a massive redirection of the water system in Australia. Wendy Carlisle, at the head of this investigation, voices concern that "landholders and governments don't yet know the impact this will have. **It is the great coal seam gas experiment.**"

DID YOU KNOW?

40,000

CSG mines could be drilled in Queensland alone by the year 2030.

300

gigalitres (equivalent to about 60% of the water in Sydney Harbour) may be removed from the Earth in Australia each year due to CSG mining, according to the National Water Commission.

31,000,000

tonnes of waste salt (enough to fill the Melbourne Cricket Ground to the brim 15 times) could be produced by CSG extraction over the next 30 years.

ENVIRONMENTAL IMPACT

Coal seam gas may be **just as environmentally damaging** as other fossil fuels—and by some estimates, even more so. CSG has been promoted for its lower emissions when burnt, but these figures ignore the full life-cycle emissions of the industry. When fully operational, the CSG trade could produce **up to 39 million tonnes of CO₂ equivalent every year**—the same as the emissions from every car in Australia.

Why is CSG harmful?

Methane gas.

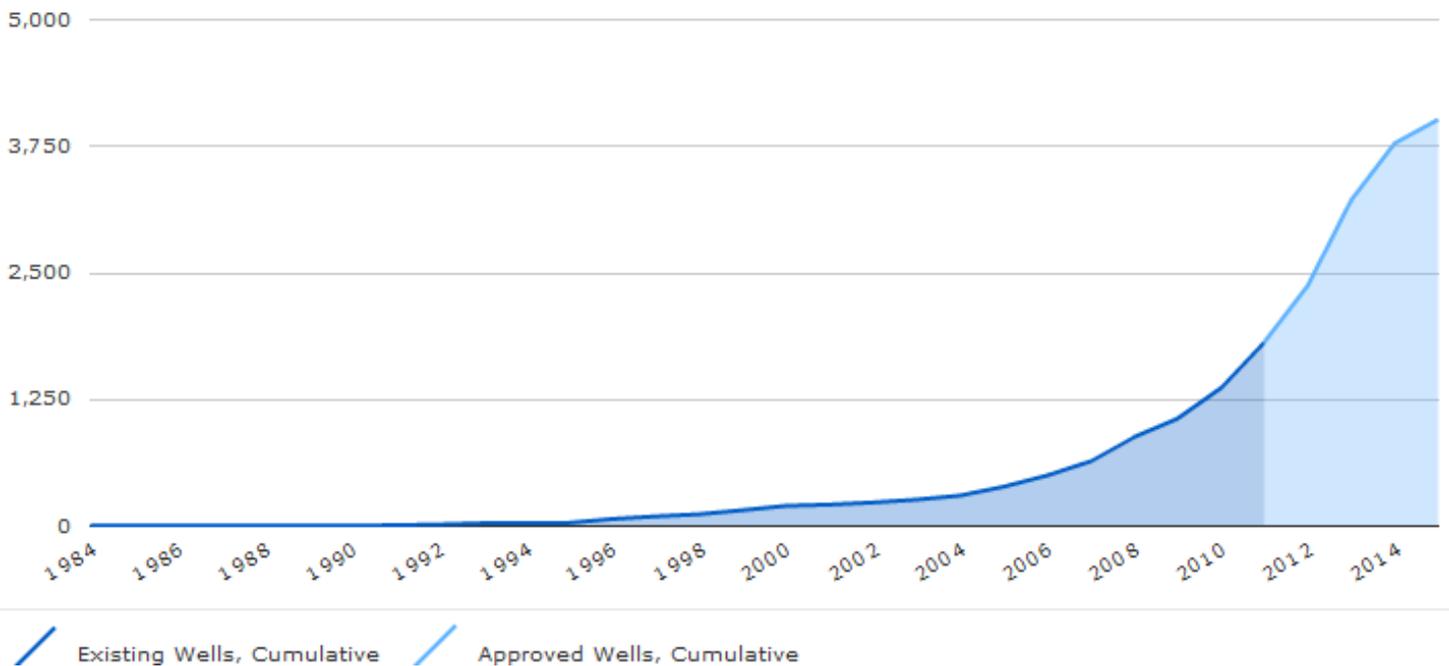
Like carbon dioxide, methane – of which most coal seam gas is composed – is a greenhouse gas. When burnt, methane produces fewer emissions than coal, but is at least **twenty times** more polluting than CO₂ before burning. The mining process sees a large amount of un-burnt methane leaking into the atmosphere, adding to greenhouse pollution. Methane leakage of 3% over all wells would **cancel out any emissions advantage** CSG has over coal. As research estimates a leakage rate of 3.6 to 7.9%, CSG may produce a **significantly larger emissions footprint** than coal.

Water use.

Mining companies are entitled to extract massive amounts of water from delicate groundwater systems, raising serious concerns for Australia’s Great Artesian Basin—a vital source of water for Australian homes and farmers. Certain companies also have permission to release contaminated wastewater into the Condamine River in Southern Queensland, potentially inflicting dramatic damage on local agriculture and the natural ecosystem. Each corporation may discharge water into this river at a rate of **20 megalitres per day** – approximately the volume of 8 Olympic swimming pools.

How quickly will the industry continue to grow?

On top of this, **40,000 coal seam gas wells** are predicated to be drilled in Queensland over the next 20 years.



FARMING & FOOD SECURITY

The CSG drilling process poses a significant threat to Australia’s ability to safeguard its food supply, and this—Food Security— may be one of the most pressing environmental issues of the 21st Century. In coming years, Australia is likely to experience difficulty feeding a growing population, with pressure to continue exporting food. The worst effects will be felt by those already in need.

Coal seam gas is often found beneath highly fertile soil, creating conflict over land use in farming communities. The Darling Downs and the Liverpool Plains are areas with some of Australia’s highest CSG activity, but currently produce more than **22% of Australia’s food**. The loss of this land to CSG mining would mean the destruction of prime farming soil and an uncertain future for food production in Australia.

In the News.

May, 2011

A dangerous leak at a CSG well west of Brisbane shoots gas and water high into the air for over 24 hours.

February 2012

Santos, a CSG mining company, admits to **several major spills of toxic water in the Pilliga state forest**. Due to high levels of arsenic, lead and salts, large areas of trees and vegetation were killed.

May 2012

Large-scale anti-CSG protests are held in Lismore and Sydney CBD, with attendance of 7000 and 6000 people.

November, 2011

Farmers in north-west Queensland express their concern over the mounting effects of CSG mining on their land and livelihood. The Carroona Coal Action Group demand an inquiry into the actual economic value of the coal seam gas industry.

March, 2012

NSW Parliament debates a moratorium (temporary delay in implementation) of CSG projects. The bill fails to pass in the Upper House, despite pressure from environmentalists and rural NSW.

April 2012

A CSG company spills contaminated fluid into the Condamine River, posing a serious threat to the Murray-Darling Basin.

Reflect.

For the healing waters of creation, which bring pleasure and health, purity and life,
We thank you, God.

For the conviction that you have called us to love and restore the Earth,
Strengthen us, O Spirit.

From heedless misuse and dishonoring of the wonders of your hand,
Good Lord deliver us.

From squandering resources, abusing our companion species, and polluting the habitat we all share,
Good Lord deliver us.

For the determination to begin our stewardship anew,
Strengthen us, O Spirit.



Dead vegetation at Pilliga state forest with contaminated water still present.

Make a difference.

- **Get educated** about the status and practice of coal seam gas mining in Australia. Visit the ABC's dedicated website at www.abc.net.au/news/specials/coal-seam-gas-by-the-numbers/ for detailed information and statistics.
- **Discuss** the issue of CSG with your friends & family.
- **Send an email to the NSW Premier, Barry O'Farrell**— office@premier.nsw.gov.au. Demand that he make good on his election promise and deliver a planning system that protects the environment and local communities.
- **Sign a petition** registering your position against the state of coal seam mining in Australia. Such petitions can be found online at: GetUp! - www.csg.getup.org.au/ No Gas Mining in Sydney – www.nogasmininginsydney.com/flyers/Stop_CSG_petition.pdf

↪ Cut and place under your CLRI(NSW) fridge magnet.

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