Climate Media Centre

Guide to Gas

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Gas 101

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Gas is a hot political topic at the moment, but it is complex. The lack of industry transparency, the emissions produced by gas and loaded terms such as 'natural gas' make it difficult for everyday Australians to form a clear picture of what's going on and why it's important to them.

This guide is designed to provide you with accurate information and tools to cut through the complexity and produce accurate, fact-based stories quickly.

Key Points

- Gas is a fossil fuel. Burning and producing gas drives climate change.
- Emissions from the extraction, processing and export of gas have been the main driver behind Australia's official emissions staying so high. The official figures for emissions from gas are likely significantly underestimated.
- Investing in new gas is unlikely to pay economic dividends and so it is a waste of stimulus spending. Investing further in gas risks locking in huge investment losses, stranded assets and environmental harm.
- Renewable energy can provide long-term employment opportunities that the gas industry cannot.
- Renewable energy is the lowest cost form of new electricity generation and keeps dropping in price each year

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1. Gas is a fossil fuel that's driving climate change

Gas is a fossil fuel, mostly made up of methane. **Methane is the second-most significant greenhouse gas after carbon dioxide** and a key driver of climate change.

Using gas for energy creates greenhouse gas pollution driving climate change in three ways:

- **Burning gas** for energy produces carbon dioxide, the most significant greenhouse gas.
- **Gas production creates greenhouse gas emissions** at every stage of its supply chain, even before it's burned. In the short-term, one tonne of methane warms the atmosphere 84 times as much as one tonne of carbon dioxide.[1]
- **Liquefying gas, a necessary step in preparing gas for export, is very energy intensive**.[2] This energy is most often provided by the consumption of fossil fuels, increasing the amount of greenhouse gas in the supply chain.[3]

Fugitive emissions are a huge source of emissions during gas production. These are emissions of greenhouse gas that occur during the extraction, processing and transport of gas:

- **Venting** occurs when gas is directly released to the atmosphere. This means methane, which is the major chemical in gas, enters the atmosphere and warms the climate.
- **Flaring** burns gas to reduce workplace hazards and certain other risks. Burning methane means that carbon dioxide is sent to the atmosphere instead.
- **Leaks** are poorly monitored in Australia. The official Commonwealth Government data assumes that leaky pipes release no gas in Australia, and never have.[4]
- **Migratory emissions** are a poorly understood phenomenon where, as a result of unconventional gas operations, methane is released through natural fissures in the earth, far from the wellhead.[5]

The failure to appropriately measure leaks, as well as our poor understanding of migratory emissions, mean that fugitive emissions from gas are routinely underestimated.

New tracking technology that measures gas emissions globally shows that gas production releases far more dangerous greenhouse gas emissions than officially measured.[6] This matches what is seen in the atmosphere, with methane levels being far higher than what is officially counted.[7] **Fugitive emissions in Australia have risen 46% since 2005.[8]**

The terms 'natural gas' or 'Liquefied Natural Gas' (LNG) are misleading marketing terms and the idea that gas is a 'clean fuel' is wrong. Australian emissions from gas keep going up, driven by the LNG export market that's tipped to export over 80 million tonnes in 2020.

The dramatic growth in greenhouse gas pollution associated with LNG between 2015 and 2020 will effectively cancel out emissions reductions from Australia's Renewable Energy Target.[9]

When fugitive emissions are considered alongside the immense quantities of fossil fuel based energy used by the gas industry to liquefy gas for export, the reality is that gas may be no better for the climate than coal.

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2. New gas is an uneconomic use of stimulus spending

The Federal Government has promoted the idea of a 'gas-led recovery' to lead us out of the economic downturn.

But experts and analysts, including the independent government Australian Renewable Energy Agency (ARENA) say that the high cost of producing Australian gas, combined with a global drop in oil and gas prices, make gas an uneconomical option to base an economic stimulus on.[10]

The gas industry has shown itself to be financially unstable. Recently, in Queensland, the oil and gas industry needed to be bailed out by taxpayers. Between March and April 2020 alone, the industry shed 40% of its workforce.[11]

The failed economics of Australian gas, combined with the emissions created by gas production that fuel climate change, make gas an economic recovery option we can't afford.[12]

3. We can move to renewable, clean power without any new gas

New gas is an unnecessary and dangerous step in Australia's efforts to tackle climate change.[13]

After 30 years of inaction on climate change from successive Australian governments, there is no room to develop further fossil fuel infrastructure.[14] The rapid development of battery storage technology makes renewables backed by batteries a cheaper, cleaner option than developing more gas-fired generators as we shift from coal-fired power.[15]

Existing coal and gas infrastructure alone will push the world past globally agreed temperature goals.[16] Australia is highly vulnerable to climate change impacts, like bushfires, drought and extreme heat. Further gas expansions increase our exposure to climate risks.

Contrary to repeated claims from the proponents of gas, there is no reputable energy scenario that shows the domestic use of gas growing over coming decades.[17] This includes all of the latest scenarios developed by the Australian Energy Market Operator (AEMO), which has responsibility for managing Australian energy networks on a day-to-day basis.[18]

Australia is the sunniest and windiest inhabited continent on the planet.[19] Australia has everything it needs to make deep, enduring and immediate cuts to greenhouse gas emissions.[20] By refusing to step up to the immense opportunities a zero-carbon economy offers, Australia is being left behind countries with fewer renewable resources.[21]

4. Australian gas pushes up power prices

Australia is the world's largest exporter of LNG, responsible for 24% of global exports.[22] Yet, Australians have been paying some of the highest prices for gas in the world.

Around 70% of the gas extracted in Australia is contracted for export, with the other 30% split across homes, manufacturing and electricity generation.[23]

An Australian Competition and Consumer Commission (ACCC) report, released in January 2020, showed that domestic gas has tripled in price since the opening up of Queensland CSG fields for export.[24]

The expense of gas is the reason electricity prices have escalated since at least 2016.[25] In contrast, renewable energy is the lowest cost form of new electricity generation and keeps dropping in price each year.[26]

The pricing structure around Australian gas imports and exports is opaque and secretive, and the gas industry is not required by the ACCC to release figures showing contract prices for gas. Analysts have surmised that Australians pay up to 51% more for gas as consumers in key export markets including South Korea and Taiwan.[27]

The Federal Government often claims that 'supply' is the issue around high domestic gas prices,[30] and uses this reason to lobby for establishment of new gas fields and exploration licenses, while failing to regulate the gas export market.[31] It has used the 'supply' argument to push for expansion and development of terminals to import LNG for our domestic market, despite Australia exporting more gas than any country in the world.

Australia's supply of gas has dramatically increased over the past several years,[32] and so have power prices for Australian consumers.[33] If supply was the answer, this problem would have been solved already.

Calls to set a domestic gas reservation on all gas fields, including those currently producing, from groups including Centre Alliance, IEEFA and even the ACCC have been repeatedly ignored.[34] Setting a domestic gas reservation would lower prices for Australian gas users but would eat into gas industry profits, with the cost falling to the industry coffers not the consumers.

The high cost of Australian gas has been hurting manufacturers,[28] and has sent a number of Australian manufacturers offshore or out of business.[29]

5. Gas extraction is dangerous

The gas industry uses the terms 'conventional' or 'unconventional' to describe gas reservoirs.[35]

Conventional gas is trapped in naturally porous reservoir formations that are capped with rock. When a well is drilled, gas flows to the surface without the need to pump.

Unconventional gas is found in more complex geological formations which limit the ability of gas to be extracted. Three types of unconventional gas are extracted in Australia: coal seam gas, shale gas and tight gas.

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Coal seam gas (CSG) holds methane and is found with underground coal seams, often held in place by pools of ancient groundwater ('fossil water'). This must be removed to access the gas (de-watering). CSG extraction can contaminate groundwater, which has serious consequences for farmers. Coal seam gas extraction often uses fracking to increase the supply. Significant CSG extraction activity occurs through New South Wales and Queensland, and exploration is occurring in Western Australia and South Australia.

Shale gas holds methane in clay-heavy, layered rock formations known as shales. Within shales, gas is contained in small pores that do not allow the gas to flow freely. Fracking is always required to access shale gas. Gas is currently being produced from shale formations in the Northern Territory and exploration is occurring in Queensland, South Australia and Western Australia.

Tight gas is similar to shale gas, except that the methane is found in sandstone. As with shale gas, tight gas extraction always requires fracking. The little production of tight gas in Australia happens in Western Australia and New South Wales, always alongside existing CSG or shale gas activity. Some new exploration is underway in Queensland and the Northern Territory.

6. What's fracking?

Fracking is one of the most environmentally damaging ways to extract fossil fuels. Also known as '**hydraulic fracturing**', fracking involves forcing massive quantities of sand-bearing water, loaded with chemicals, deep underground.[36] The pressure behind the injected fluid mix creates and sustains new fissures in the rock, which allow the gas to flow more freely.

Fracking uses many dangerous chemicals.[37] These can contaminate local land and water supplies.[38] The identities of the specific chemicals used in a frack are usually kept secret from the communities they affect, and, if something goes wrong, can cause catastrophic damage to local agriculture, bushland and waterways.[39]

Chemicals used in fracking include: tetrakis hydroxymethyl phosphonium sulfate, naphthalene, ethoxylated 4-nonylphenol and formamide. Potential health problems caused by fracking chemicals include cancer, nervous system damage and respiratory problems.[40]

Fracking is a catastrophic risk. Gas industry-funded studies that assess the impact of fracking with reference to a small number of hand-picked sites do not tell the full story.[41]

7. The Australian gas industry operates as a cartel

According to leading analysts, the Australian gas industry allegedly engages in price-fixing and anti-competitive behaviour to keep domestic gas prices high, essentially operating as a cartel.[42] The ACCC has repeatedly raised concerns about the conduct of the East Coast Gas Market.[43]

There is no effective independent oversight of gas projects. The gas industry itself pays for and oversees the advice to the government on the environmental and social impact of projects.

The Australian gas industry is made up of a mix of international majors (e.g. BP, ExxonMobil, Royal Dutch Shell) and Australian majors (e.g. Woodside, AGL, Origin Energy, Santos).

The East Coast Gas Market is dominated by five big gas companies - Australia Pacific LNG, Origin Energy, QGC, AGL and Santos. These companies provide over half the funding of Gas Industry Social & Environment Research Alliance (GISERA)—an alliance between the gas industry and CSIRO.

GISERA advises governments on the social and environmental impacts of unconventional gas development, such as water contamination and greenhouse gas emissions, which determine whether gas developments can go ahead.

As this body is funded and overseen by the gas industry, which has a vested interest in underplaying damage caused by gas extraction, it is misleading to present GISERA or the research it produces as 'independent.'[44]

Resources

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Facts at your fingertips

Dangerous, expensive and unnecessary - Climate Council gas factsheet

Primed for Action: A resilient recovery for Australia - Climate Council report

Pollution and price: the cost of investing in gas - Climate Council report

Is the gas industry facing its Volkswagen moment? - IEEFA

Towards a domestic gas reservation - IEEFA

Coal seam gas is high cost gas - IEEFA

Victorian onshore gas emissions - The Australia Institute

GISERA and the conflict of interest - The Australia Institute

Scott Morrison's gas transition is a dangerous road to nowhere - Tim Baxter, The Conversation

350's Fossil Fuel Watch - 350, links between the fossil fuel industry and government advisors

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