- Natural gas

⊕ CHEMISTRY IN PRACTICE



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How green is natural gas?

"Gas is often presented as a halfway-green energy source – but is it really?"

CLIMATE In 2023 some 17% of Australia's energy generation used natural gas, with the percentage far higher in WA and the NT.

Some 70-90% of natural gas is the greenhouse gas methane, with the chemical formula CH_4: one carbon atom and four hydrogen atoms – it is a hydrocarbon compound just like oil and coal, so it is a fossil fuel. And as a greenhouse gas, methane is some 25 times more potent than CO_2.

Whether natural gas seems 'green' or not depends whether you compare it with coal or renewables. Gas is certainly at the lighter end of fossil fuels, greener than coal, with a higher energy content and burning more efficiently.

But compared with renewable energy generation from sources such as solar panels and wind turbines, it is far less green. During power generation, wind turbines and solar panels emit zero CO_2/kWh. For natural gas, the figure is 350-490g of CO_2/kWh. These figures do not, however, include whole-of-life carbon use. For wind power this would include the industrial manufacture and disposal of turbine blades. But even including this, CO_2 emissions for wind-power generation are still almost 20 times lower than power generated based on natural gas.

So the word 'natural' should not be taken as meaning that natural gas is truly 'green' in terms of emissions.

Natural gas is less than half as bad as coal... but still bad

The direct CO_2 emissions from energy generation are highest for coal power. Gas can more than halve the emissions from coal, but still produces more than 20 times the emissions of top performers solar and wind energy.



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COAL EMITS THE MOST

1 Coal power is the highest CO_2-emitting form of energy. Coal burning emits some 1000g of CO_2 per kilowatt hour of power generated by coal-fired power plants.



YUSNIZAM YUSOF/SHUTTERSTOCK

NATURAL GAS BEATS COAL

2 The burning of natural gas emits 350-490g of CO_2 per kilowatt hour of generated power – that's if the gas is contained and does not leak to the atmosphere during extraction.



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SUN + WIND ARE GREENEST

3 The manufacture of solar panels and wind turbines emits CO_2 into the atmosphere, but over the entire product life, wind turbine power is 20 times greener than gas.

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