ENVIRONMENTAL ACTION GROUP

AN ACTION GROUP OF THE UNITING CHURCH IN SOUTH AUSTRALIA

What everyone should know about GAS AS A 'TRANSITION' FUEL?

*This is a less-technical summary of a **Fact Shee**t by David McKirdy and Tony Hill, retired petroleum geologists with decades of experience: commissioned by the **Environmental Action Group (EAG)** of the SA Synod of the **Uniting Church of Australia**. It has been approved by its authors.*

The **Fact Sheet** outlines the science of natural gas and addresses the question of its role in Australia's 'transition' to a de-carbonised economy. *Sources* are found in the main article: (see at bottom).

- **Natural gas**, being a **fossil fuel** derived from the buried remains of bacteria, algae and plants, is a mixture of methane (its principal component) and other hydrocarbons and gases including CO_2. Its methane component is 86 times stronger than CO_2 at trapping heat. When natural gas is burnt, it is converted back to CO_2 and water vapour, the primary **greenhouse gases** (GHGs), which are vented into the atmosphere. **Coal seam gas** (CSG) and **shale gas** are unconventional forms of natural gas.

- Natural gas power plants must be carefully managed for their 'lifecycle' GHG impact to remain lower than that of coal-fired plants. This is because of methane leakage during drilling, extraction, and transportation. When included these **"fugitive" emissions** make natural gas similar to coal in its negative impact. Producers are poor at monitoring fugitive emissions. Globally, leakage has been estimated to account for a third of the total human-induced release of methane to the atmosphere prior to 2020. The authors reckon it will be hard for Australia to reduce its carbon emissions if new coal seam and shale gas resources are developed, as more wells are needed than in conventional gas fields. For example, 850 wells are planned for the Narrabri CSG project in NSW.

- **Water** is a precious resource in Australia, the world's driest continent, and will become more so. Uncoventional gas extraction uses vast amounts of water that is not recoverable. A single well with horizontal drilling can require 11 to 45 million litres of water initially — way more than in conventional vertical wells. And similar volumes of water are needed each time a well undergoes additional fracturing to maintain well pressure and gas production. Other problems include earthquakes triggered by high pressure pumping into injection wells — and health risks to nearby communities posed by contamination of ground and surface water with chemicals used in drilling and hydraulic fracturing, and the disposal of wastewater.

- **"Green hydrogen"** is the ultimate clean energy resource. However, its production requires a lot of energy, in which case only low-carbon electricity (hydro or wind power) will result in a substantial reduction in GHG emissions. With the increased scale and lower costs of renewables, green hydrogen is predicted to become economically competitive by 2040.

- The paper notes the current promotion of **carbon capture and storage** (CCS) as a 'technological fix' for global warming. However, CCS remains both expensive and niche, and so far, has not captured significant global emissions (less than 1%). Further, it can't be 'tacked on' to existing power plants unless the local geology is suitable to store the CO_2, which is rare. CCS is less a 'climate solution' than an expensive approach to drag out the decades of fossil fuel usage and therefore cannot be considered a technological 'answer'.

The International Energy Agency (IEA) has said that for the world to reach net zero emissions by 2050, our reliance on fossil fuels must end, and much more quickly than previously thought: *"If governments are serious about the climate crisis, there can be no new investments in oil, gas and coal, from now – from this year".* Our former Chief Scientist Alan Finkel summed up the long-term viability of gas in this way: *"Electricity from renewable energy (and in some countries from nuclear) will eventually completely replace all fossil fuels as energy sources"*.

The information in the EAG Fact Sheet is fully Sourced. Emphases are only in this extract.