appea
the voice of australia's oil and gas industry

NATURAL GAS: EMISSIONS REDUCTION

REDUCING EMISSIONS

Gas has an essential role to play in reducing emissions in Australia and around the world.

When burned or used for electricity generation, natural gas releases up to 50% less carbon dioxide than coal[1]. When compared to the National Energy Market (NEM) average - the average emissions released by the interconnected network connecting the east coast of Australia to the electricity grid - natural gas is much cleaner, with lower emissions.

INDUSTRY RESPONSES

The oil and gas industry has organised around several initiatives in order to collectively reduce greenhouse gas emissions and continue to play a positive role in climate change policy developments.

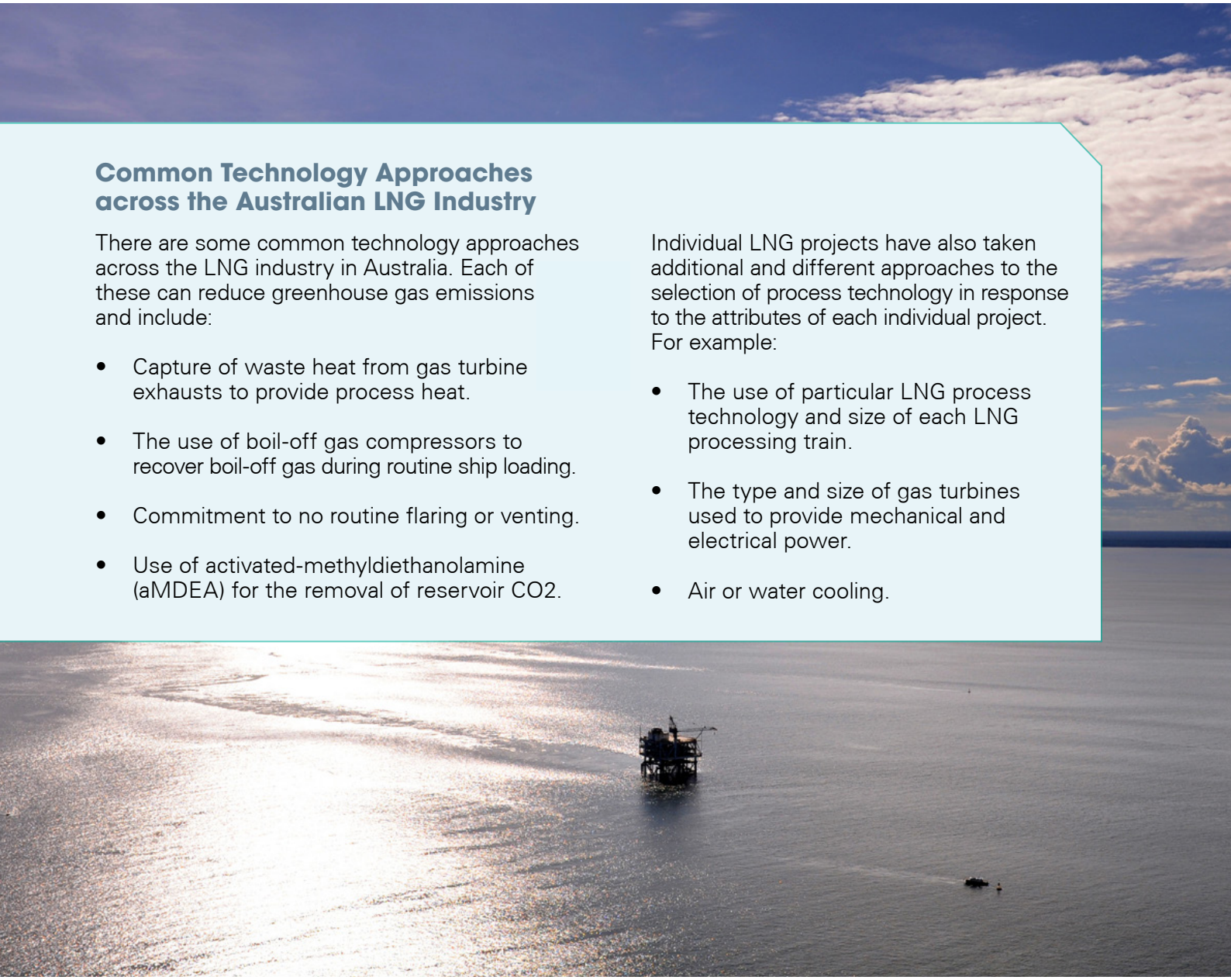
These actions encompass the entire oil and gas exploration and production life cycle and include:

- Industry joint initiatives.
- What we do when we design our facilities.
- What we are doing in our facilities (both in Australia and globally).
- What we are doing around our facilities.
- Low emissions research & development.

Industry Joint Initiatives

An example of industry joint initiatives is the Oil and Gas Climate Initiative (OGCI). OGCI is a voluntary global initiative which aims to lead the industry response to climate change. OGCI comprises thirteen companies (seven of which are APPEA members), all aiming to increase the ambition, speed and scale of emissions reduction initiatives[2].

To that end, OGCI launched a $1 billion fund, OGCI Climate Investments, in 2016. The fund seeks to decarbonise sectors like oil and gas, industrials and commercial transport. Outcomes are focused on reducing methane, CO2 and technology which can recycle or store CO2[3].



Common Technology Approaches across the Australian LNG Industry

There are some common technology approaches across the LNG industry in Australia. Each of these can reduce greenhouse gas emissions and include:

- Capture of waste heat from gas turbine exhausts to provide process heat.
- The use of boil-off gas compressors to recover boil-off gas during routine ship loading.
- Commitment to no routine flaring or venting.
- Use of activated-methyldiethanolamine (aMDEA) for the removal of reservoir CO2.

Individual LNG projects have also taken additional and different approaches to the selection of process technology in response to the attributes of each individual project. For example:

- The use of particular LNG process technology and size of each LNG processing train.
- The type and size of gas turbines used to provide mechanical and electrical power.
- Air or water cooling.

Implementation of New Technologies (CCS)

Technology is key to reducing emissions associated with extracting natural gas.

Carbon capture and storage (CCS, also known as greenhouse gas storage) is the process whereby large volumes of captured carbon dioxide are safely injected and stored deep underground rather than being released to the atmosphere. Since 1996 the global oil and gas industry has led the world in the practical deployment of this technology.

Chevron's Gorgon Project on Barrow Island includes the Gorgon CO2 Injection Project, the safe underground injection and storage of between 3.4 - 4 million tonnes CO2-e greenhouse gases per year, or around 100 million tonnes over the life of the project.

The Moomba CCS project, operated by Santos, proposes to capture the 1.7 million tonnes of carbon dioxide currently separated from the gas processing plant each year and reinject it into the same geological formations that have safely and permanently held oil and gas in place for millions of years. In 2020, Santos will complete the design phase and be ready to make a final investment decision. Injection could commence as early as 2022.

Practical action to reduce emissions

The industry is supporting proactive, tangible steps to reduce greenhouse gas emissions.

Across Northern Australia, the oil and gas industry supports fire abatement programs. The Darwin LNG facility is an industry leader in emissions abatement through their partnership with the West Arnhem Land Fire Abatement (WALFA). In this program, Indigenous fire managers have restored burning practices, with large environmental (and cultural) benefits for traditional owners. Since its inception in 2006, WALFA has offset 2 million tonnes CO2-e.

The industry also engages in tree planting programs to offset emissions. For example, Santos and joint venture partners have developed a 1,250 hectare plantation of local tree species in Queensland.

How Facilities are Designed to Minimise Emissions

Technology is key to reducing emissions associated with extracting natural gas and other resources around Australia.

In 2018 Santos commenced work on a program to convert oil well pumps to run on solar power. Converting oil well pumps to solar power will deliver environmental and commercial benefits by reducing crude oil consumption, long distance fuel haulage and emissions associated with burning crude oil.

Santos, as operator of DLNG, is investing in an innovative battery project to reduce the facility's carbon emissions from power generation by 20 per cent. The battery will enable the existing turbines to run at maximum efficiency and remove the need to run an additional turbine, saving thousands of tonnes of fuel gas and reducing maintenance costs. DLNG will become the world's first LNG plant to install a battery to reduce emissions, providing a template for other LNG facilities.

Woodside Energy is pioneering the installation of a lithium-ion battery on an offshore platform. The one megawatt hour (MWh) battery, built in Australia, provides back-up capacity to the platform's power generation system. This allows the platform to run on fewer gas turbine generators, decreasing fuel consumption by 3,000 tonnes per year and improving energy efficiency by 4%.

Low emissions research & development

The industry continues to support a range of collaborative research centres, including the CO2CRC (focused on carbon capture and storage), Future Energy Exports CRC (focused on leveraging Australia's position as a leading LNG exporter for the export of hydrogen) and the Future Fuels CRC (focused on using existing gas infrastructure for fuels like hydrogen).

1. *IGU, 2020, https://www.igu.org/natural-gas-cleanest-fossil-fuel*
2. *OGCI, 2020, https://oilandgasclimateinitiative.com/*
3. *OGCI, 2020 https://oilandgasclimateinitiative.com/climate-investments/*