

A wide-angle photograph of a bright blue sky filled with large, fluffy white cumulus clouds. The clouds are scattered across the frame, with some appearing more prominent than others. The overall scene is bright and clear.

# Greenhouse gas

**INPEX is committed to managing greenhouse gas emissions and reducing its carbon footprint. Liquefied natural gas can help reduce global carbon emissions, as it produces less carbon dioxide than other fossil fuels when burned.**

## KEY FACTS

- Onshore and offshore design optimisations for the Ichthys Project will result in a reduction of 100 million tonnes of greenhouse gas (GHG) emissions.
- The Ichthys Project will comply with all legislative requirements for emissions reductions and seek to better these requirements where it is technically feasible and commercially viable.
- INPEX is investigating a wide range of options to further reduce or offset GHG emissions.
- Every tonne of liquefied natural gas (LNG) used to generate electricity avoids the emission of up to 4 tonnes of CO<sub>2</sub> when compared with traditional coal-fired electricity generation.

The “greenhouse effect” is the natural warming process of the earth caused by the trapping of solar energy in the lower levels of the earth’s atmosphere by GHGs, principally carbon dioxide (CO<sub>2</sub>), methane and water vapour.

In recent years, however, the increase in GHG emissions worldwide, caused primarily by intensive agriculture, land clearing and the burning of fossil fuels, has affected the necessary equilibrium between incoming solar radiation and the outgoing emissions of heat energy from the earth. This imbalance, the “enhanced greenhouse effect”, is believed to be the cause of global warming. Of all the gases contributing to global warming, CO<sub>2</sub> is considered to be the most significant.

## Reducing GHG emissions

One of INPEX’s core Corporate Social Responsibility principles is to recognise its responsibility to help preserve the environment and contribute to sustainable development in the communities in which it operates.

INPEX is committed to managing its GHG emissions and reducing its carbon footprint by:

- Actively promoting the reduction of GHG emissions across our operations in a safe, technically and commercially viable manner.

- Increasing energy efficiency, reducing resource consumption and reducing its overall environmental footprint.
- Incorporating onshore and offshore design optimisations for the Ichthys Project that will result in a reduction of 100 million tonnes (Mt) of GHG.

An option under consideration which could reduce GHG emissions by further 18Mt is to provide electricity for the gas processing facility through a combined cycle power plant. This would involve generating power by a combination of gas turbines and steam turbines, with the steam being generated from heat recovered from gas turbine exhausts. Should this occur it would be the first LNG facility in the world to generate power through this method.

INPEX has demonstrated its commitment to GHG management by:

- Becoming one of the founding members of the Global Carbon Capture and Storage Institute.
- Joining Australia's Cooperative Research Centre for Greenhouse Gas Technologies, the CO2CRC, in 2008.
- Participating in Japan's Nippon Keidanren Voluntary Action Plan on the Environment through the Japan Petroleum Development Association, to meet the goal of bringing Japan's GHG emissions to at least 20% below the 1990 level between 2008 and 2012.
- Investing US\$25 million in emerging companies in the areas of clean energy, e.g. solar and wind power generation, storage cells, waste disposal, improved energy efficiency and innovative materials.
- Working to test carbon capture and storage (CCS) technology at its Iwanohara site in Japan with the Research Institute of Innovative Technology for the Earth (RITE) since 2003.
- Joining 30 other leading Japanese companies in the electricity, petroleum-refining, oil and gas, and engineering industries to establish Japan CCS Co., Ltd. in May 2008 to carry out research and development projects for CCS technology.
- Researching a system for using microbes in depleted oil reservoirs to convert CO<sub>2</sub> into natural gas for reuse.

## Ichthys Project and GHG

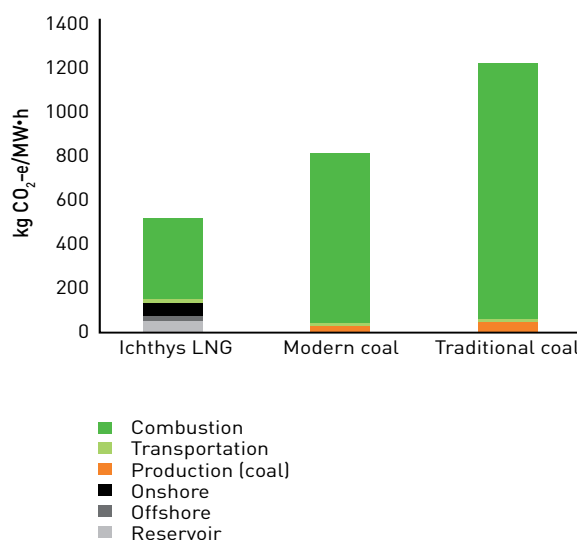
The Ichthys Project is expected to emit approximately 280 Mt of CO<sub>2</sub> over its 40-year lifetime. This amounts to an average of 7 Mt of greenhouse gases per year. This includes both the reservoir CO<sub>2</sub> and combustion CO<sub>2</sub> emitted from the offshore and onshore processing facilities.

The 40-year annual average for offshore CO<sub>2</sub> emissions is expected to be 1.8 Mt per year and onshore CO<sub>2</sub> emissions are expected to be 5.2 Mt per year.

Once the Ichthys Project is fully operational, onshore and offshore emissions are expected to account for approximately 1.2% of Australia's total CO<sub>2</sub> emissions.

While GHG will be emitted from the Project, LNG actually reduces net global GHG emissions when it is used in power plants to displace other more emissions-intensive fuels, e.g. coal.

Electricity produced from LNG generates 40–60% less CO<sub>2</sub> than electricity produced from coal. Every tonne of LNG used to generate electricity avoids the emission of up to 4 tonnes of CO<sub>2</sub> when compared with traditional coal-fired electricity generation. (See the figure below adapted from Chapter 9 of the *Ichthys Gas Field Development Project: Draft Environmental Impact Statement*).



## Offsetting GHG emissions

Reinjection of reservoir CO<sub>2</sub> into deep underground geological formations (geosequestration) is being investigated to determine its technical feasibility and commercial viability.

INPEX has initiated a tree-planting project in Western Australia to understand the potential for offsetting CO<sub>2</sub> emissions using biosequestration. To date 1.4 million mallee trees have been planted as part of the project.

The Ichthys Project continues to assess GHG abatement options in order to define an appropriate plan to manage GHG emissions.

## Further reading

Chapter 9 of the *Ichthys Gas Field Development Project: Draft Environmental Impact Statement*