

## **LNG and CARBON TAX**

Expansion of Australia's LNG industry will negate any attempt to reduce carbon emissions by a carbon tax. Rather than raise revenue, the proposed carbon tax is different from other taxes in that its objective is to reduce Australia's carbon dioxide emissions. The target is to reduce emissions below Australia's 2000 levels by as much as 25%. Today, emissions are about 80 million tonnes of carbon dioxide more than they were in 2000 so that the target emissions reduction could be in the order of 100 million tonnes. These reductions are to be achieved using a combination of carbon tax and other measures including the renewable energy targets (RET).

However, with the developments Australia's LNG industry in both Western Australia and Queensland, carbon emissions are set to rise dramatically from today's levels. In the production of LNG from natural gas or coal seam gas any carbon dioxide in the raw gas is removed. To-date this carbon has been emitted to atmosphere but newer projects could geo-sequester these emissions as is the case with the Gorgon project in WA. To produce the LNG requires extensive refrigeration plant which is driven by electricity. This is generally produced on-site by burning some of the gas in a gas-turbine. For coal seam gas there is an additional electricity demand for the compression of the gas for transmission to the LNG liquefaction plants (on Curtis Island). Approximately 15% of the gas is used to produce electricity for the process which will produce carbon emissions discharged to atmosphere. For every million tonnes of LNG produced approximately half a million tonnes of carbon dioxide will be emitted from the generation of electricity required.

The sheer size of the proposed LNG developments, potentially producing over 60 million tonnes of LNG by 2016, will produce an additional 30 million tonnes of carbon emission and if all of the schemes and developments come to fruition, the total additional carbon emissions could exceed 60 million tonnes by 2020.

It is argued that LNG is a relatively clean fuel, displacing more polluting coal from the world's energy fuels. However, as the burgeoning demand for Australian coal shows this cannot be wholly true. Indeed most of the new LNG developments are slated to supply the growing cities of India and China which need fresh energy sources to supply the heat and power for major new cities. These cities are generally being populated from the country where renewable fuels dominate (wood, animal dung), so if anything LNG is displacing renewable fuels not coal.

If a carbon tax is to be applied then the LNG industry should pay its fair share. It cannot be equitable to apply a carbon tax to domestic power generators and hence domestic consumers but somehow exempt power generated for LNG which will benefit foreign consumers for no measurable emission benefit.

Export LNG is unlikely to be able to pay much in the way of carbon tax (or be subject to RET), unless as an export industry, along with all other export industries, it would have the cost remitted. This will result in negligible reduction in carbon emissions which is the stated objective of the carbon tax.

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Additional notes:

A list of current committed LNG project is given in the Table.

AUSTRALIAN LNG PROJECTS						
Project	Company	Site	Capex \$Billion	Start	Production Mt/y	To
Gorgon LNG	Chevron/Shell/ExxonMobil	Barrow Island, WA	43	2012	15	30
Ichthys gasfield	Inpex Holdings	Browse Basin/Darwin	22	2016	8	8
Wheatstone LNG	Chevron/Apache/KUFPEC/Tokyo Electric	Carnarvon Basin/Dampier	20	2016	8.6	25
Qld Curtis LNG	BG Group	Gladstone Qld	16.7	2014	8.5	12
Gladstone LNG	Santos/Petronas/Total	Gladstone Qld	16	2014	7.2	10
Shell Curtis Is	Shell (Arrow) and Petrochina	Gladstone Qld			16	16
Australian Pacific LNG	Origin/ConocoPhillips	Gladstone Qld	35	2014	14	16
Fishermans Landing	LNG Ltd.	Gladstone Qld			1	3
Pluto Train 1	Woodside Energy	Burrup Pensinsula	12.1	2011	4.3	4.3
TOTAL					82.6	124.3
CO2 EMISSIONS	tonne CO2/tonne LNG	0.587			48.49	72.96

#### 1. CO2 Emissions

The above CO2 estimates assume a thermal efficiency for the production of LNG is about 85%. The exact value will be project dependent. This value includes all of the facilities for LNG production. Note the value often quoted of about 93% efficiency for LNG is the efficiency of the refrigeration plant alone and does not incorporate utility (power water etc.), off-sites (ship loading etc) or operation of large gas plants for the removal of carbon dioxide from the raw gas. Coal bed methane plants are likely to have lower efficiencies due the extensive compression required and the necessity to pump and dispose of large volumes of brackish water.

- Australia's carbon emissions are reported by National Greenhouse Gas Inventory at <http://www.ageis.greenhouse.gov.au/>. The 2000 figure is 496.18 Mt/a and the 2008 value is 576.11Mt/a. These account for Land Use, Land Use Change and Forestry (LULUCF) changes which are subject to a fair amount of error in the estimates.
- It is not clear what the target is. The Australian Greenhouse Office website talks about a target of 5% to 25% of 2000 value. Recent commentary has primarily concentrated on a target of 5% below 2000 levels; see <http://www.climatechange.gov.au/government/reduce.aspx>.