

Economic Issues

No. 2

Timor Sea Natural Gas Development: Still in Embryo

Author:
Mr Andrew Symon
Research Associate
South Australian Centre for Economic Studies

August 2001

**South Australian
Centre for Economic Studies**

ISSN 1445-6826

Copyright: All rights reserved. The Copyright Act 1968 permits fair dealing for study, research, news reporting, criticism or review. Selected passages, tables or diagrams may be reproduced for such purposes provided acknowledgement of the source is included. Otherwise, no part of this publication may be reproduced, stored or transmitted in any form or by any means without the prior permission in writing of the Publisher.

Disclaimer: While embodying the best efforts of the investigators/authors, and while every reasonable effort has been made to ensure accuracy, neither the South Australian Centre for Economic Studies, the

Editor's Note

Economic Issues is a series of reports published by the South Australian Centre for Economic Studies, as part of the Centre's Corporate Membership Program. The scope of *Economic Issues* is intended to be broad, limited only to topical, applied economic issues of relevance to South Australia and Australia. Within this scope, the intention is to focus on key economic issues — public policy issues, economic trends, economic events — and present an authoritative, expert analysis which contributes to both public understanding and public debate. *Economic Issues* is published on a continuing basis, as topics present themselves and as resources allow.

This issue presents an overview of the current situation with respect to the development of the massive Timor Sea natural gas reserves. It is a paper which is of general interest, but with particular relevance to the future development of the Northern Territory. In addition, the major projects likely to be associated with the development of the Timor Sea natural gas reserves will also have broader significance for the Australian economy as a whole.

The author of this paper is Mr Andrew Symon. Andrew Symon is a Research Associate of the SA Centre for Economic Studies. He is a journalist and economic analyst working in South East Asia, currently based in Singapore, now working for the UK-based energy analysis group Petroleum Argus, as editor of its *Asia Pacific Gas and Power* Report. Andrew has worked throughout East Asia since 1992, as editor of various newsletters and on projects ranging from Asian Development Bank funded government policy planning projects to industry surveys and market studies for private companies. His work focuses on energy issues, infrastructure development, and the business and public policy issues associated with the provision of primary infrastructure. Andrew is an honours graduate in history and economics from the University of Adelaide.

The Centre gratefully acknowledges the financial support of its Corporate Members, which enables the preparation of these papers.

Kevin Kirchner
Editor
28 August, 2001

Timor Sea Natural Gas Development: Still In Embryo

Summary

Some 20 trillion cubic feet (Tcf) of natural gas reserves have been identified in sedimentary basins in the Timor Sea, making it potentially one of the world's major gas producing provinces. Petroleum liquids — oil and condensates — have also been found in the region. An array of natural gas projects, requiring total investment of several billion dollars, are planned and proposed by major foreign and Australian owned companies to harness these reserves.

This paper provides a description of the extent of the reserves in the Timor Sea and of the various projects currently planned or proposed.

Development of the Timor Sea gas reserves is, however, at an embryonic stage. Plans are ambitious and their progress to reality is likely to take several years, at least.

Nevertheless, world demand for natural gas over the long term is expected to be strong and sustained, so that the prospect of major investment in the Timor Sea proceeding is high.

The scale of the possible development is such that it is likely to have a major impact on the economy of the Northern Territory, while also contributing significantly to the growth of the Australian economy.

1. Overview

An array of natural gas projects requiring total investment of several billion dollars are planned and proposed by major foreign and Australian owned companies to harness the abundant natural gas reserves in the Timor Sea between northern Australia and East Timor.

Planned projects and proposals include a natural gas liquefaction (LNG) plant and a methanol plant in Darwin or its surrounds; an offshore “floating” LNG plant (a proposal in competition with the

Jurisdiction is shared.

Timor Gap. This divided the area into three zones: one nearest East Timor, administered entirely by Indonesia; one zone nearest Australia, administered by Australia; and a middle, and largest zone, administered jointly by the two governments, with revenue share divided between the two.

The establishment of an independent East Timor means new treaty arrangements ...

The end of Indonesian rule in 1999 and the establishment of an independent East Timor meant that a new treaty was needed for the zone. Subsequently, East Timor, under its provision 7.1((

... which have affected development plans.

The tax situation is not likely to become clear for several months, as Timor's decision-making structure is now in limbo. The East

Natural gas reserves are massive.

Shell, Phillips Petroleum (30 per cent), Royal Dutch/Shell (26.56 per cent), and Osaka Gas (10 per cent).

- **Evans Shoal field** - located 300 km north of Darwin and 160 km south east of the Greater Sunrise area in Australian waters. There are believed to be reserves of at least 6.6 Tcf of gas and 31 mm bbl of condensate. The field is operated by Royal Dutch/Shell. Partners in the development are Shell (50 per cent), Santos (40 per cent) and Osaka Gas (10 per cent).
- **Petrel/Tern fields** - located in the Bonaparte Basin, 255 km west of Darwin in Australian waters. There are believed to be reserves of at least 1.5 Tcf of natural gas. The fields are operated by Santos, who have a 95 per cent interest in the Petrel field and a 100 per cent interest in the Tern field.

3.2 Crude Oil Reserves

Oil is also found and produced in the Timor Sea. Fields include the 145,000 barrels per day (b/d) Laminaria and Corallina oil fields, 550km west-north-west of Darwin and 160km south of Timor, operated by Woodside; BHP-Billiton's 45,000 b/d Buffalo oil field; and BHP-Billiton's Elang Kakatua and Kakatua North oil fields. Prospects for additional production appear good. Recently, Cultus, the Australian subsidiary of Australian energy company OMV, discovered oil 20km in Australian waters northeast of the Tenacious oilfield. Strong flows were reported from its Audacious-1 well.

4. Co-operative vs Competitive Development

*Development strategies
continue to unfold ...*

Timor Sea gas development plans and proposals feature both competition and co-operation between the lead companies.

In November 2000, Woodside and Phillips announced that Greater Sunrise and Bayu Undan were to be developed co-operatively, after Woodside transferred equity to Phillips, raising its stake to 30 per cent. Prior to this, Woodside and Shell formed an unincorporated venture in 1997, the North Australian Gas Venture (NAGV), to co-operate in the development of Greater Sunrise and Evans Shoals. The Woodside Phillips agreement was made at the time of Shell's attempt to takeover Woodside, a bid that was rejected by the Federal Government in April 2001 as being contrary to the national interest. Some viewed Woodside's agreement with Phillips as cutting against its understanding with Shell.

One recent factor which suggests that there remains a fine balance between competition and co-operation in gas development was an announcement by Shell in August 2001 of an LNG plant proposal that appears to compete with Phillips' earlier proposal. Shell's announcement came soon after Phillips said that it had "indefinitely

deferred” the natural gas development phase of its Bayu Undan project because of uncertainty over the company tax regime that will be imposed in the joint development zone under the new treaty between Australia and East Timor.

5. Downstream Gas Processing and Transport Plans

Major projects already planned or proposed include ...

The following projects are being put forward to commercialise Timor Sea gas:

- **Phillips LNG onshore plant** – Phillips of the US proposes an onshore natural gas liquefaction plant near Darwin producing about 5 million tonnes per year (mt/yr). Such a liquefaction plant would cost of the order of US\$2 billion dollars. This does not take into account upstream development costs, costs of shipping, and consumers’ receival terminals. The aim is to supply LNG to US West Coast and Mexican markets, an opportunity created by the current and expected to be continuing high gas prices from US and Canadian fields. Phillips signed a letter of intent (LOI) in March 2001 with US downstream gas and power supply company El Paso, to supply 4.8 mt/yr of LNG to Southern California and Mexico’s Baja California peninsula. The LOI proposes that sales begin in 2005. Upstream gas supply – 650 mmmcf of gas is needed for the LNG output - would initially come from the Phillips operated Bayu Undan fields. Longer run supply would come from the more abundant Sunrise fields, operated by Woodside, and where Phillips is a partner.
- **Royal Dutch/Shell LNG offshore plant** - Shell announced in August 2001 its proposal for what would be the world's first floating liquefied natural gas (FLNG) plant. This would be associated with the development of the Greater Sunrise gas fields in the Timor Sea. The facility would be located offshore on a barge, close to the proposed Sunrise drilling platform. Shell has not indicated costs. It says that as well as manufacturing LNG the barge offers the option of compressing gas for delivery by pipeline to Darwin. This would support the development of new industries in the Darwin area and provide for the longer-term supply of gas to customers in the eastern states of Australia.
- **Methanex methanol plant** - Canadian company Methanex proposes a US\$780 million export oriented 2 mt/yr methanol plant near Darwin using natural gas as a feedstock. This plant would likely in the longer term replace the Methanex facility in New Zealand. The latter now serves Asia Pacific markets, but declining gas reserves at this locality are forcing Methanex, the world’s largest producer of methanol, to look for a new site. Methanex signed a letter of intent in March 2000 with Woodside

and Shell to take 290 mmcf/d of gas from their NAGU venture. A target date for plant operation is 2005.

- **Nabalco alumina refinery** - Gas sales are proposed to the already operating Nabalco alumina refinery at Nhulunbuy on Gove Peninsular for the plant's power generation. Current bauxite reserves are expected to last until 2030.
- **Northern Territory Power and Water Authority** – Gas sales are proposed for power generation.
- **Transmission pipeline to southern and eastern Australian domestic markets** – Rival proposals have been put forward for long distance domestic transmission pipelines by Epic Energy (a joint venture between El Paso and Dominion Resources of the US and investment arms of AMP, Deutsche Bank, and Hastings Fund), and Australian Pipeline Trust (a joint venture between Australian Gas Light and Petronas, Malaysia's state oil and gas company).

Epic Energy entered into an alliance in 1999 with Phillips Petroleum to pursue development of a US\$1 billion, 2,200 km pipeline to take gas from the Timor Sea to Moomba in central Australia. At Moomba the new pipeline would connect to the existing pipeline network to New South Wales, Victoria and South Australia. There is also the possibility of a spur line to Queensland. An indicative date of 2004 has been set for pipeline operation, with construction taking about 18 months.

Australian Pipeline Trust proposes a similar route and also a possible spur to Queensland. Already it operates a pipeline in the Northern Territory, which takes gas from the Amadeus Basin in central Australia northwards for mainly power generation in Darwin. The company says this pipeline could be developed as a north south conduit for Timor Sea gas.

The possible Queensland spurs for Timor Sea gas proposed by each of these groups challenges plans by a group led by Exxon Mobil, for a major long distance gas pipeline from Papua New Guinea to eastern coast Queensland, down to Brisbane and possibly beyond. This project has been in planning for several years but has fallen well behind earlier timetables.

Supply to Queensland is also being pursued by Woodside from the Greater Sunrise fields. In May 2001 Woodside and Shell signed a letter of intent for a 20-year supply of up to 50 mmcf/d of gas for QNI's Yabulu nickel and cobalt refinery at Townsville. The gas would be used for power generation and processing feedstock. QNI is owned by BHP-Billiton.

6. Conclusions

Development is at an embryonic stage.

Development of the Timor Sea's gas reserves are at an embryonic stage. Plans are ambitious, with their progress to reality likely to take several years at least. Although a number of proposals have target operation dates of around 2005, a more sensible time frame for government policy planning (and associated business investment) might be 2010. Apart from the immediate uncertainty created as a result of the emergence of the new state of East Timor and its desire to review company tax arrangements in the common maritime zone jointly administered with Australia, the economics of natural gas commercialisation are an obstacle to speedy development.

The challenges to realizing development are significant.

Natural gas reserves are far more difficult to commercialise than oil and condensates if there is no downstream infrastructure already in place. Whereas petroleum liquids can be sold directly into the market, with producers taking market prices, natural gas producers first need to put in place the infrastructure to transport and process the gas. Gas markets must be created. The extended time it can take to commercialise a gas discovery is underlined by the fact that gas was first found in the Greater Sunrise area in 1974 by Woodside. Prior to development long term gas supply contracts must be secured, in order to ensure sufficient economic scale of operation and thereby give companies and financing agencies confidence to make the large, long term investment necessary. Gas supply negotiations can be a lengthy process. Natural gas project development can take many years before operations begin.

Once infrastructure is in place, additional supply can, however, be introduced far more quickly and simply. Ultimately, with many sellers and buyers, true market conditions and shorter term or spot natural gas trade may develop. Such a process is beginning to develop in the southern and eastern Australian gas markets. Initiatives since the mid 1990s at Federal and State government level to create a liberalized and integrated gas (and electricity) supply system out of the formerly discrete State based systems, has the potential to result in a large scale, competitive domestic gas and electricity system, whereby producers can readily commercialise fields and sell into the market.

The obstacle created by the need for large upfront investment to be in place before new development can begin holds for projects aimed at both domestic supply and also for LNG processing for export markets.

In particular, LNG is a very high capital cost process, requiring, *inter alia*, supply plant, ships and receiving terminals. LNG processing becomes economic over simple pipeline supply of natural gas once the pipeline distance from field to consumer becomes too great. Construction of new LNG plants in the past have not begun until there have been firm contracts for at least a large proportion of plant output in place, because of the need to guarantee plant finance.

