

An overview of Asia-Pacific exploration

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Abstract

A summary of pertinent issues, country details and recent exploration highlights in the Asia Pacific region is presented.

Introduction

Oil and gas exploration and production is an international business of immense size, conducted in a global environment of intense competition. More countries than ever are open for business and are aggressively seeking the investment capital which is becoming more available due to continuing high prices for oil and gas.

Investment assessment is a risk analysis evaluating the risk of gaining reward and weighing against this, the costs of gaining that reward. Factors which are considered include the broad categories of: –

- Technical risk – prospectivity; the likely amount and type of hydrocarbons;
- Political (sovereign) risk – government stability and the impact a change of government may have, fiscal regime changes, corruption, etc;
- Market risk – future prices, costs, fiscal regime behaviour, etc.

Since the mid-nineties exploration has become more global with exploration opportunities ranked on a global basis. As a consequence, governments have become more aware of their position in the global market for exploration acreage and have become much more proactive, with targeted marketing efforts consistent with the business environment, their country's geology and regionally competitive fiscal terms.

The Asia Pacific region represents more than half of the world's population – China, India, Indonesia, Pakistan, Bangladesh and Japan rank among the world's ten most populous countries – and is marked by it's diversity in terms of cultural, social and political background.

This paper briefly summarises particular issues of relevance to explorers in the Asia Pacific region and sets out a summary of individual countries and recent exploration highlights. It should be noted that in the discussion "Asia Pacific" includes the countries of the sub-continent, Southeast Asia and East Asia, but excludes the countries of Australasia.

The following matters are discussed, not to imply any criticism whatsoever, but by way of illustration of some of the issues which must be considered and understood when conducting petroleum operations in the region.

Of necessity, each topic is glossily simplified, full consideration of any could involve a major conference in its own right. The following notes (discussed in alphabetical order) are sourced from IHS Energy, public domain data available on the Web, and our own experience in the region.

General issues

Availability of data

New Zealand petroleum legislation requires companies to submit data and technical reports to Government on their exploration activities as part of their obligations following the grant of a petroleum title – the resultant data are made publicly available after certain clearly-defined periods of time. Although this system is also true of many other parts of the world, it is the exception rather than the rule in Asia.

In several instances, data is not submitted to the government at all and important decisions such as release of new blocks may be based on old, poor quality data.

That is not to say, data is not available – it is always available for a price and we are aware of instances where “tight-hole” drilling data has been sold on the streets before being made available to joint venture partners.

Border disputes

Border disputes are endemic in the Asian region, particularly in the offshore realm. In recent times, however there appears to be the widespread realization that ongoing disputes are counter-productive, particularly in an area of rapidly-developing energy markets, and a new atmosphere of cooperation is emerging.

Perhaps the best known area of dispute is the Spratly Islands in the South China Sea. The 1000 km-wide archipelago has an area of around 240,000 sq km and comprises 150 reefs, 13 shoals and atolls, four banks, 16 islands (largest is Spratly Island, maximum height 2.4m, area 13 hectares) and several fortified platforms. The Islands are claimed all, or in part, by China, Taiwan (in any event regarded as part of China by China), Vietnam, Philippines, Brunei and Malaysia. Claims are historic and complicated, some claimants use centuries-old evidence of discovery as basis for title. The Battle for Fiery Cross Reef in 1988 involved armed conflict between China and Vietnam. Despite apparently irreconcilable differences among the claimants, a joint seismic survey over part of the area was carried out in 2005 by China, Philippines and Vietnam.

China and Japan have a long-running dispute in the East China Sea. Bilateral talks held in 2004 failed to make any headway in resolving the entrenched territorial dispute. During these talks, the Chinese delegation reportedly refused to provide Japan with details of the Chunxiao gas development project – the field, located near the line that Tokyo has proposed as the border of the two nations’ exclusive zone, was expected to produce first gas during 2005. The area is gas-prone, as previous exploration by Chinese state companies CNOOC and Sinopec-Star has demonstrated. Sinopec-Star discovered a series of gas fields, including Chunxiao, Tianwaitan, Duanqiao and Huangyan. It is reliably reported that the Japanese Ministry of International Trade & Industry (MITI) acquired a large (5,000 sq km) 3D survey over part of the disputed area.

Negotiated settlements of border disputes have been rare. However, in 2004 Indonesia and Vietnam negotiated an agreed boundary over their formerly-disputed boundary north of Natuna Island in the western South China Sea. Following acquisition of a non-exclusive survey over the area by TGS-NOPEC in 2004, an area that had been locked up for around a quarter of a century is now attracting strong industry interest.

The Thailand Cambodia overlapping claim area extends over more than 27,000 sq km and covers part of the Pattani and Khmer basins in the Gulf of Thailand, both known to be hydrocarbon-bearing.

Although the area has seen no substantial exploration activity since 1974, both countries have awarded conditional exploration and production licences to add weight to their claims. A paper by Quentin Rigby at the 2003 SEAPEX Conference suggested that the area could contain 8–15 Tcf gas and 400–1000 million barrels of oil.

In some areas, joint development authorities have been established to develop resources pending determination of the disputed border issue. Petroleum operations in the Joint Development Area (JDA) between Malaysia and Thailand are governed by the Malaysia-Thailand Joint Authority Act(s) 1990, which entered into force simultaneously in both countries on 23 January 1991. The contractual framework for operations in the JDA is based closely on the Malaysian model of production sharing. Contracts are negotiated with and awarded by the Joint Authority. This model is also used in the disputed border area between Australia and Timor Leste where export gas production has recently commenced at the Bayu-Undan Field.

Petroleum fiscal systems

As noted by petroleum economist Daniel Johnston, there are more different petroleum fiscal systems in the world than there are countries. Whereas Australia and New Zealand operate tax-based concessionary systems where economic rent is contingent on production, various types of contractual systems (collectively known as “Production Sharing Contracts” – PSCs) dominate the Asia Pacific region.

A Production Sharing Contract is an agreement between a contractor and a host government whereby the contractor bears all exploration risks, development and production costs in exchange for a stipulated share of resultant production. Many aspects of the PSC are negotiated between the government and contractor, allowing for flexibility to counter local differences between basins and licence areas.

In several countries in the region, Joint Ventures operate, whereby the NOC becomes a partner with the contractor – the NOC may or may not be carried through the exploration phase and any contribution to capital expenditure and operating expenditure may be repaid out of production.

Role of NOCs

Major contributors to exploration and production in Asia are the National Oil Companies (NOCs). Individual countries may have several NOCs; in China for example, former state enterprises include CNOOC (which undertook an unsuccessful takeover of Unocal last year), PetroChina and Sinopec.

The strategies and policies of the NOCs in the region will have a substantial, long-term impact on the pace of resource development in the coming years. The interplay between NOCs, major oil-producing countries and Western and Asian consumer countries will have a large impact on the question of energy security and stability of oil and gas markets, raising many questions – of particular relevance are the rapidly-developing markets of China and India, together with the recovered markets of Japan and South Korea.

The national oil companies are in the process of reevaluating and changing business strategies, with substantial consequences for international oil and gas markets. It is a time of great change inside the leadership of these national oil companies, and goals and priorities will be different than those of the Western international majors, with potentially serious consequences for market stability and oil geopolitics. Many of these emerging national oil companies are funded by or have operations subsidised by their national governments, with geopolitical and strategic aims factored into investments rather than purely commercial considerations.

The Western international majors are interested in strengthening ties with emerging national oil companies to diversify their operations and enhance supply security, but strategic alliances have been difficult to form (for example, BP’s attempts to establish a strong presence in Russia).

NOCs own over 80% of global petroleum reserves. Ranked on the basis of oil and gas reserve holdings, 14 of the top 20 upstream oil and gas companies in the world are NOCs. State monopolies represent

the top 10 reserve holders internationally – by comparison, ExxonMobil and the Royal Dutch Shell Group are ranked 12th and 13th while BP and Chevron are ranked 16th and 19th respectively. In terms of world oil production, however, only six of the top firms are national oil companies, while ExxonMobil, Royal Dutch Shell, BP and Chevron represent among the largest oil and gas producers worldwide. Of the top 20 oil and gas producers worldwide, 14 are national oil companies or newly privatized national oil companies. Within the Asian region important NOCs include PetroChina, Sinopec and CNOOC (China), Petronas (Malaysia), Yukos and Lukoil (Russia), Pertamina (Indonesia) and ONGC (India).

Strategic investment and trade alliances for emerging national oil companies are also being sought on the basis of geopolitics rather than economic considerations. CNPC, for example, is studying forming investment alliances with Petronas and continues to desire a strategic investment in a Russian oil company. Russia, on the other hand, has shown reluctance for its oil companies to connect with Western or Chinese firms but has announced interest in forming alliances with Saudi companies.

China and India have recently signed five memoranda of understanding to further strengthen energy ties between the two countries. Three of the agreements for cooperation were India's Gas Authority of India Ltd (GAIL) and China National Offshore Oil Corporation (CNOOC), Sinopec and Beijing Gas Corporation for joint exploration, development and production. Another agreement covered research and development while the fifth was signed between ONGC Videsh (OVL) and China National Petroleum Corporation (CNPC).

Sovereign risk

In general, sovereign risk is not overly serious issue in the Asia Pacific region. However, revocation of the Sakhalin III PSA in Far East Russia and the ongoing dispute between ExxonMobil and Pertamina over the Cepu oilfield (scouting information suggests reserves could be around 500 million barrels recoverable) in East Java , are vivid reminders of the type of problem which can develop.

Transparency

Although there are outstanding examples of transparency and accountability in the region, many Asia Pacific countries suffer from corruption, in some cases endemic. We make no comment other than to make the statement that one has to be acutely aware of local conditions when doing business in the region.

Country notes and highlights

Bangladesh

The state petroleum agency, Bangladesh Oil and Gas Corporation (Petrobangla) is authorised to sign Production Sharing Contracts (PSCs) with private companies.

It is understood that the Bangladesh Government is planning to launch a licensing round in which acreage in the deeper waters of the Bay of Bengal will be offered. Interest in the country's offshore has been resurrected following Daewoo Petroleum's highly significant Shwe-1 gas discovery in neighboring Myanmar at the beginning of 2003 and countries such as China, India, Malaysia and Thailand are believed to be keen on acquiring exploration rights.

Production & Reserves

2004 Production: 1,280 MMcfgpd ; 3,600 bcpd

Cumulative Production: 5.21 Tcf 11.87 MMbc

Brunei

Oil and gas accounts for more than half of Brunei's GDP and approximately 80% of its exports. Operations are controlled by the Petroleum Unit in the Prime Minister's department. In early 2002, a new State oil company, Petroleum Brunei was established.

Petroleum rights are granted under the terms of a Petroleum Mining Agreement. Terms are largely negotiable and based on a production sharing contract.

During 2004 Brunei Shell Petroleum (BSP) and Total were the only oil and gas producers in the country.

Production & Reserves

2004 Production: 200,000 bopd; 5,900 bcpd; 1,223 MMcf/gpd

Cumulative Production to 2004: 2,886 MMbo; 172.1 MMbc; 10.74 Tcfg

2004 Remaining Reserves: 1,063 MMbo; 207.1 MMbc; 11.83 Tcfg

Cambodia

Petroleum Regulations were issued in September 1991, which provide a general framework for exploration and production activities. More detailed provisions are contained in petroleum agreements which are negotiated individually. Model contracts are issued from time to time based on production sharing.

Chevron is reported to have made several oil discoveries in Block A, adjacent with the Overlapping Claims Area which is disputed between Cambodia and Thailand in the Gulf of Thailand.

Cambodia currently has no production with small reserves of oil and gas.

China

China, particularly offshore, draws a great deal of interest from the international exploration community. All acreage is vested in three main state companies – China National Offshore Oil Company (CNOOC), PetroChina and Sinopec.

On 8 April 2004, CNOOC announced its 2004 bid round, offering ten joint-venture blocks across offshore China. As of end-2004, some 36 international companies held 68 license areas that covered a total of 125,045.84 sq km in on- and offshore China.

There is no complete, systematic data available for state company drilling activities in onshore China. Information regarding the state companies' onshore drilling program is difficult to acquire and even when available, tends to focus on successful events. As the dominant operators in onshore China, PetroChina and Sinopec typically drill over 2,000 exploratory wells per year. This is partly a result of their unique "progressive exploration".

Production & Reserves

* condensate included

2004 Production: 3.49 MMbopd*; 3.935 Bcfgpd

Cumulative Production: 30,725 MMbo*; 19.51 Tcfg

India

From the 1960s, the Indian government granted petroleum licences exclusively to the newly-formed national oil companies. In the 1970s, foreign oil companies were first invited to participate in exploration

and production by entering into Production Sharing Contracts (PSCs) with a national oil company. This practice remained in place into the 1990s. However, under the New Exploration Licensing Policy (NELP), first announced in 1997, the national oil companies no longer retain their previous privileges. Foreign oil companies deal directly with the Ministry of Petroleum and Natural Gas.

In 2002, a new model contract was issued in connection with the Third Round of the NELP.

Deep water exploration is acknowledged to be strategically important in India. In 2003 the Oil and Natural Gas Corporation of India (ONGC) announced that it intends to drill 47 deep water wells over the following five years in an attempt to add 6 Btoe to the existing reserve base by 2020 – 4 Btoe to be generated from successful deep water exploration, with the remaining 2 Btoe generated from producing and frontier basins.

India is currently of great interest to the exploration community – Cairn Energy is reported to have found at least half a billion barrels of oil in the onshore Rajasthan Basin and continuing exploration successes are reported from the Krishna-Godavari Basin offshore of the East Coast.

In 2002, Reliance, India's largest private sector company, and its partner, Canadian independent Niko Resources, announced a giant deepwater gas discovery 20 kilometers offshore in the Krishna-Godavari Basin. The discovery stands as the biggest gas find in India in three decades, and was among the world's largest gas discoveries in 2002. Reliance estimates gas in place in excess of 7 Tcf, with recoverable reserves over 5 Tcf. However, integrated 3D seismic and well interpretation indicates that the reserves could be significantly higher.

In mid-2005 a significant discovery (said to be in the order of 20 Tcf by the Chief Minister of the State of Gujarat, but with caution subsequently advised by the Operator), was reported from the KG-8 well in Krishna-Godavari block KG-OSN-2001/3. The well was drilled to a depth of 5,061m, the deepest well drilled to date in the basin. The successful joint venturers include the Gujarat State Petroleum Corporation, GeoGlobal Resources of Canada and Jubilant Enpro (another Indian conglomerate).

Production & Reserves

2004 Production: 685,000 bopd; 3.04 Bcf/gpd

Cumulative Production: 6,290 MMbo; 17.01 Tcfg

Remaining Reserves: 5,265 MMbo; 25.4 Tcfg

Indonesia

Indonesia is the most important oil and gas producer in the region. In recent years, the country has undergone huge structural change as it has become truly democratic – corresponding changes have occurred in petroleum legislation and regulation. Of note has been the emergence of BPMigas as the regulatory body replacing NOC Pertamina which has become a "normal" E&P company without regulatory functions.

On 2 November 2004, the Indonesian government announced the successful bidders for 12 new PSCs, three under a "Fourth Round" of Migas-controlled acreage releases and nine under a direct proposal system.

A total of approximately 44,000 line km of 2D seismic data, 2,650 sq km of 3D data and 170 sq km of 4D data were acquired both on and offshore in Indonesia in 2004 (12,000 line km of 2D data, 5,200 sq km of 3D data and 31 sq km of 4D data in 2003).

A total of 85 exploration wells were completed in the country during 2004, 58 "wildcats" or "exploratory" and 27 delineations of earlier discoveries.

The government has awarded a 30-year contract for the Cepu oilfield in Java, which could be producing 170,000 barrels per day of crude by 2008, while the companies have agreed to equal 45% interests in

the block with the remaining 10% split two thirds to East Java province and one third to Central Java. ExxonMobil and Pertamina have agreed to form a joint venture to manage the Cepu development but are still negotiating over its leadership. The two companies have come under increasing pressure from the government to break the impasse.

Perhaps the most exciting new exploration in the region is in the eastern Makassar Strait offshore of Sulawesi where an Plio-Pleistocene fold belt has been delineated by a series of non-exclusive surveys conducted by TGS-NOPEC. With little interest in the area prior to the surveys, an initial bid round conducted in late 2005 over part of the fold belt resulted in multi-well bids from several major oil companies. A bid round over the remainder of the offshore part of the fold belt is anticipated in early 2006.

Production & Reserves

2004 Production: 960,000 bopd; 8,163 MMcfgpd; 133,000 bcpcd

Cumulative Production: 21,350 MMbo; 51.0 Tcfg

Remaining Reserves: 10,500 MMbo; 215 Tcfg

Japan

Japan is the world's fourth largest energy consumer. There are no international companies directly involved in petroleum exploration and development in Japan. All licences are operated by domestic companies including Teikoku, Japex and JOGMEC. The country's needs for oil and gas are almost entirely dependent upon imports.

Production & Reserves

2004 Production: 11,940 bopd; 239,000 cfpd

Cumulative Production: 315 MMbo; 4.2 Bcfg

Remaining Reserves: 54 MMbo; 1.3 Tcfg

Malaysia

Petroleum Nasional Berhad (Petronas) is vested exclusive petroleum rights in Malaysia and is authorised to make agreements with foreign oil companies. In 1997, a new model Production Sharing Contract, with costs recovery and profit sharing linked to profitability (the contract is often referred to as the Revenue/Cost Contract), was introduced for all areas.

2004 saw Malaysia maintain its position as the second busiest country in SE Asia (after Indonesia), and is the second largest producer of hydrocarbons in the region, again behind Indonesia. The year witnessed a significant increase in exploration drilling in Malaysia, with a total of 51 exploration and delineation wells.

The first deepwater oil discovery offshore Malaysia was made in 2002 by Murphy Oil and Petronas Carigali in deepwater Block K with the successful Kikeh-1 well. Murphy reported that the initial well found in excess of 150 net metres of oil pay. The average net pay of three appraisal wells and two associated sidetracks was 120–190m. Furthermore, all oil pay sands appeared to be in communication and were full to base with oil.

Shell and its joint venture partners ConocoPhillips and Petronas Carigali have also been very successful offshore Sabah with the Malikai-1 (2004), Ubah-2 (2005) and Pisagan-1A (2006) discovery wells. The Pisagan-1A exploration well encountered both oil and gas in the reservoir objective; the well is located in water depth of about 1,465 metres.

Although no reserves are yet published for any of these discoveries, scouting information suggests each could be in excess of 400 million barrels.

Recently, the national oil companies of Malaysia, Indonesia and Vietnam have reportedly found oil at block SK 305 offshore Sarawak, East Malaysia. PetroVietnam reported that initial tests of a well at the block flowed 3,000 barrels of oil per day.

Production & Reserves

2004 Production: 726,000 bopd; 5.197 Bcfgpd; 36,600 bcpd

Cumulative Production: 5,341 MMbo; 20.36 Tcfg; 218.44 MMbc

Remaining Reserves: 5,171 MMbo; 83.03 Tcfg; 597.29 MMbc

Myanmar

In 1965, all private petroleum operations were nationalised and assigned to the Peoples Oil Industry, under the supervision of the Ministry of Mines (later changed to the Ministry of Energy). Under the State-Owned Economic Enterprises Law of 1989, the Ministry of Energy assigns rights to areas to the national oil company, Myanmar Oil and Gas Enterprise (MOGE), which may enter into Production Sharing Contracts (PSC) with oil companies.

In 1989, Myanmar first issued a model production sharing contract. In August 1995, the Ministry opened the Ninth Licensing Round and issued a summary of terms offered for onshore and offshore blocks based on a 1993 model.

2004 saw higher levels of exploration activities in terms of contract awards and seismic surveys, although there has been a decline in the number of exploration wells drilled, compared to the previous two years.

On 9 January 2005, Daewoo plugged and abandoned Shwe-1 as a gas discovery in the Bay of Bengal. The well tested approximately 32 MMcfg/d on a 48/64" choke from a pay zone at 2,963-2983m TVD in Lower Pliocene basin floor fan sandstones. Daewoo has subsequently announced a further two gas discoveries nearby and an in-place resource of around 10 Tcf is indicated. It is noteworthy that Daewoo's partners are Indian NOCs OVL and GAIL and the Korean NOC KOGAS.

In onshore Myanmar, Thai NOC PTTEP continues to be active, conducting a 2D seismic survey and drilling one exploration well in 2004, resulting in at least one gas discovery.

Production & Reserves

2004 Production: 9,789 bopd; 1.150 Bcfgpd; 10,253 bcpd

Cumulative Production: 585.4 MMbo; 2,612 Bcfg; 14 MMbc

Remaining Reserves: 461.6 MMbo; 14.22 Tcfg; 95 MMbc

Pakistan

Offshore licensing is based on the Model Offshore Production Sharing Agreement issued in 2003 and production sharing terms will also be available to existing offshore licence holders.

The Ministry of Petroleum & Natural Resources announced in early May 2004 that it plans to increase the level of exploratory drilling from 30 wells to 100 wells per year over the next five years, in an attempt to raise oil / condensate production from 64,000 b/d to 100,000 b/d and gas production from 3 Bcf/d to 5 Bcf/d.

The Privatisation Commission announced in early June 2004 that it intends to sell a 51% stake and management control of Pakistan Petroleum Ltd (PPL) to a strategic investor in early 2005, following the sale of a 10% interest through a public offering between 19-22 July 2004. The sell-off is understood to have been the country's largest ever Initial Public Offering (IPO) to date and the Pakistan Government, as a result of the two sales, will hold only a 27% stake in the company.

Production & Reserves

2004 Production: 50,350 bopd; 3.490 Bcfgpd; 13,000 bcpd

Cumulative Production: 476 MMbo; 17.6 Tcfg; 45.2 MMbc

Remaining Reserves: 220 MMbo; 30.1 Tcfg; 87.4 MMbc

Philippines

Development Act of 1972 and Presidential Decree No. 782 of September 1975 established the types of contract available in the Philippines. Incentives for deep water exploration were introduced in 1983. A new model Service Contract was published on 23 July 2003, replacing an earlier model.

The Philippine Department of Energy recently reported that it expects to approve 10 oil and gas service contracts in 2006 on which about US\$500 million will be spend for exploration and production. Service Contract 58 is to be awarded for northeast Palawan to Shell Exploration, Kuwait Petroleum and South China Resources. Other deals are to be signed with Sterling Energy for northwest Palawan's Reed Bank and with Philippine National Oil Company Exploration for an oil and gas project in west Palawan.

Production & Reserves

2004 Production: 377 bopd; 239 MMcfgpd; 12,000 bcpd

Cumulative Production: 51.53 MMbo; 159 Bcfg; 13.59 MMbc

Remaining Reserves: 87.6 MMbo; 4,473.2 Bcfg; 132.12 MMbc

South Korea

South Korea proudly became a hydrocarbon-producing country in 2004 with the commencement of production of the Donghae 1 Gas Field in Block VI-1. The country still imports the vast majority of crude oil and natural gas (in form of LNG) for domestic consumption.

Production & Reserves

Current Production: 53 MMcfgpd; 800 bcpd

Cumulative Production: 8 Bcfg; ~144 Mbc

Remaining Reserves (to end 2004): 300 Bcfg; ~2 MMbc

Sri Lanka

Terms and conditions of the new fiscal regime were announced at the American Association of Petroleum Geologists (AAPG) Conference in Dallas in mid-April 2004.

The Mannar Basin was delineated by a non-exclusive seismic survey acquired by TGS-NOPEC in 2001. An infill survey was acquired in 2002.

No petroleum rights are currently held in Sri Lanka, although exploration acreage in the Gulf of Mannar is expected to be offered in the country's First Licensing Round in Q2 2006.

Thailand

Concession contracts are negotiated with the Ministry of Energy, through the Department of Mineral Fuels (DMF). The present fiscal terms are commonly referred to as the Thai III terms based on significant changes introduced in 1989.

Thailand is the fourth most active country in terms of exploration activity in South East Asia, after Indonesia, Malaysia and Vietnam.

Exploration drilling in 2004 reversed a decline of recent years, with 27 exploration wells active.

Production & Reserves

2004 Production: 82,000 bopd; 2.12 Bcfgpd; 67,000 bcpd

Cumulative Production: 248 MMbo; 8,300 Bcfg; 240.8 MMbc

Remaining Reserves: 496 MMbo; 19.41 Tcfg; 535.8 MMbc

Timor Leste

On 20 May 2002 East Timor became an independent state. During the same day East Timor signed a Treaty with Australia, the terms of which govern the hydrocarbon revenue split derived from current and future production in the Joint Petroleum Development Area (JPDA) in the Timor Sea (90% will go to Timor Leste and 10% to Australia).

In 2004, Timor Leste introduced new petroleum legislation and a bid round was launched in 2005. A partnership of Norway's Global Geo Services and Chinese geophysical contractor BGP acquired a 6,500 km non-exclusive seismic survey – mandatory data for participation in the bid round.

Vietnam

Petroleum legislation in Vietnam provides that petroleum operations can be conducted by foreign oil companies under a variety of types of contracts entered into with the national oil company, PetroVietnam. Contracts are negotiated with PetroVietnam and approved by the Oil and Gas Department of the Office of Government (Prime Minister's Office).

In 2004 Vietnam continued to witness high levels of exploration drilling, a significant increase in seismic acquisition and increased contractual activity. The year also saw the opening of the country's first deepwater licensing round. Significant discoveries were made by Petronas Carigali, Unocal, TSJOC and LSJOC.

The Cuu Long Basin continues to find significant hydrocarbon accumulations in basement. In 2004 the 09-2-CNV 3X appraisal well flowed oil at 9,010 bpd and gas at 22.6 MMcfpd from granitic basement at 4,436m TVD.

Production & Reserves

2004 Production: 406,000 bopd; 592 MMcfpd; 19,000 bcpd

Cumulative Production: 1,121 MMbo; 721 Bcfg; 26.36 Mbc

Remaining Reserves: 2,563 MMbo; 22 Tcfg; 473.3 MMbc

Speaker



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He was employed at the Tasmanian Department of Mines from 1970 until 1993 and held various positions in regional geological mapping and petroleum exploration administration.

In 1993 he moved to Department of Minerals and Energy in Western Australia as Manager of the Exploration and Production Branch in the Petroleum Division, responsible for all geotechnical matters relating to petroleum exploration and production in Australia's premier hydrocarbon province.

He joined TGS-NOPEC Geophysical Company in 1997 and is Chief Geologist Asia Pacific responsible for technical matters relating to the development and marketing of non-exclusive projects in the Asia Pacific region.

A former Secretary of the Geological Society of Australia, he is a Fellow of the Geological Society and also a member of AAPG.