

THAILAND

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Thailand's GDP was about US\$174 billion in 2004. Services constitute the largest sector of the economy at 47% of GDP, followed by industry (44%) and agriculture (9%). Exports this year are expected to be worth around US\$110 billion and imports about US\$115 billion.

Thaksin Shinawatra's Thai Rak Thai Party was re-elected for a new term of office in February 2005, with a strong single-party majority. Since then the popularity of the Thaksin Administration has been challenged by a more uncertain economic outlook, corruption scandals and by persistent unrest in the south of Thailand. Economic growth has slowed from previous years to about 4.5% in 2005. Contributing factors include higher oil prices and a lower level of activity in the tourism sector due to the tsunami (December 2004) and fears of bird flu. Although in the medium term the economy is unlikely to return to the rates of growth experienced from 2002-04, the government's US\$42.5 billion programme of infrastructure works (2005-9) will provide an expansionary fiscal stimulus. The adoption of a repressive stance, including emergency powers, appears to have exacerbated resentment towards the Thaksin Administration amongst the Muslim population in the south, as well as damaging its popularity nationwide. Investors are increasingly concerned about the possibility that Islamist terrorist activities could spread to other parts of Thailand.

Thailand has a population of just over 65 million, making it the ninth-largest country in the Asia-Pacific region – a little smaller than Vietnam and Philippines – but larger than countries like Myanmar, Malaysia and South Korea. Three quarters of the population are ethnically 'Thai', with ethnic Chinese, Muslim Malays (in the far south) and Khmer (near the Cambodian border) constituting the main ethnic minorities. Theravada Buddhism is the religion of about 95% of Thailand's population.

With a total land area of 514,000 km², Thailand is bordered by Myanmar to the west and north, Laos to the north and east, Cambodia in the southeast and Malaysia in the far south. The country can be usefully divided into four main geographic regions. The southern peninsula of Thailand, 960 km in length, is rich in minerals and consists mainly of narrow coastal lowland backed by high wooded mountain ranges. Central Thailand is a fertile alluvial plain, with a well-developed system of natural waterways. The principal river is the Chao Praya, flowing north to south and forming a large delta 192 km from the coast. About one-third of Thailand's population lives in this central region, including over seven million in Bangkok. The upland regions in the north and northwest consist of the Western Hills, with ridges rising to nearly 1,000 m covered by dense tropical monsoon forests, and the Northern Mountains, rising to 1,600 m and broken by four parallel valleys which contain rivers that flow into the Chao Phraya. The northeastern plateau is a barren area with thin soil and is the poorest part of the country.

Mineral resources

Although Thailand does not compare with China, India and Indonesia in terms of mineral and fossil fuel resources, it is not an insignificant player in the Asia-Pacific region and is able to supply an important percentage of its own raw materials requirements. Thailand supplies most of its own natural gas and lignite requirements from indigenous resources (primarily for power generation) as well as just over 10% of the country's crude oil demand. In non-ferrous metals, Thailand has important zinc and tin smelting operations – as well as some mining activity, particularly in zinc and gold. In copper, projects are under development both for a new mine and a new smelter. Thailand also has a strong industrial minerals sector, with significant output of gypsum and limestone – and extensive potash resources. Although the country has virtually no iron ore resources, it has become an increasingly important steel producer, with output of steel products of 12.2 Mt in 2004, including about 4.1 Mt of basic steelmaking (from EAFs). Currently, there are

a number of new upstream steelmaking projects under consideration in Thailand, including a number of blast furnace projects.

Energy minerals

In 2004, the country produced an average 85,750 bbl/d of crude oil and 2,163 million ft³/d of natural gas. This upstream production represented 75% of the country's natural gas consumption and 10.5% of crude oil demand. Proven oil reserves have been estimated at 291 Mbbbl and proven gas reserves at 14.7 trillion ft³. Thailand has a well developed oil refining, gas processing and petrochemicals industry. The main domestic corporate players in the oil and gas sector are PTT, Thai Oil and Bangchak. The main foreign companies are Unocal, Chevron, Exxon Mobil and Total.

Thailand has substantial lignite resources (estimated at around 2,100 Mt) and produced just over 20 Mt of lignite in 2004. The largest producer is the state-owned power company, Electricity Generating Authority of Thailand (EGAT), which mined about 16.7 Mt of lignite (involving 84 million m³ of overburden removal) in 2004 for supply to its 2,625 MW mine-mouth lignite-fired power station, Mae Moh. EGAT is due for privatisation via an initial public offering on the Thai stock market by the end of 2005.

Banpu plc is the most important privately-owned coal player in Thailand, with production of about 2.1 Mt of lignite in 2004 from two mines in the north of Thailand (in Phayao and Lampang). Banpu's main coal-mining operations are in Indonesia, however, where it produced 12.9 Mt in 2004, with 15.3 Mt expected in 2005. Approximately 1.5 Mt of Banpu's Indonesian coal production was exported to Thailand in 2004, representing around 30% of Thailand's total imports of bituminous coal. Banpu is also a 50% shareholder in the 1,434 MW BLCP coal-fired power IPP project due to come on stream in 2006 and 2007 in two phases. BLCP will consume around 3 Mt/y of imported coal, although Rio Tinto has the contract to supply most of the plant's coal requirements. Banpu is listed on the Stock Exchange of Thailand. It had revenues of approximately Bt17.3 billion in 2004 and net profits of Bt3.6 billion. The company has substantial financial resources and is actively seeking investment and acquisition opportunities throughout the Asia-Pacific region in both coal mining and coal-fired power. Banpu has already invested in one coal-mining venture in China and has signed an MoU for a second investment.

Lanna Resources plc, the only other significant lignite supplier in Thailand, produced about 500,000 t of lignite from its Ban Pa Kha mine in 2004, but production from this mine is expected to cease in 2005. Lanna also has a coal mine in Indonesia (1.7 Mt/y) as well as ethanol and shipping businesses. The company, listed on the Thai stock market, is 45% owned by Siam City Cement and 10% by Banpu.

Non-ferrous metals

Padaeng Industry plc is southeast Asia's only producer of high-quality zinc metal. The company is listed on the Stock Exchange of Thailand and is approximately 47% owned by Umicore (a Belgian non-ferrous metals group) and 14% owned by the Thai Ministry of Finance. The mine at Mae Sot in Tak Province produced 167,024 t of zinc silicate ore in 2004, with an average zinc content of 26%. The mine has been in operation for 21 years and still has approximately 3.6 Mt of reserves at an average 12.3% Zn content. In 2003 and 2004 Padaeng developed a flotation plant with a capacity in excess of 96,000 t/y, which upgrades low-grade ores to concentrates. Padaeng also has a roaster plant at Rayong to process imported zinc sulphide concentrates – and is one of only a few companies in the world capable of using both zinc silicate and zinc sulphide in the same production process. In 2004, Padaeng purchased 105,881 t of zinc concentrates (mainly zinc sulphide) from South America, Australia and North America for processing at the Rayong plant.

The smelter, situated 96 km from the mine, has a capacity of 111,000 t/y of cathode zinc. Production in 2004 was 108,577 t, using a combination of silicate ores from the company's own

mine and imported sulphide concentrates. Total production of zinc metal from the refinery in 2004 amounted to 115,112 t, comprising 68,285 t of SHG and 46,827 t of zinc alloys. A total of 13,744 t of zinc ingot was imported for refining to zinc alloys.

Padaeng sold 113,708 t of metal in 2004 (similar to 2003) of which 15% was exported (mainly to China, Taiwan and Vietnam). Padaeng's domestic sales accounted for about 77% of total zinc metal consumption in Thailand in 2004. The total value of Padaeng's sales of product and services was Bt5.7 billion in 2004 and Bt3.2 billion during the first half of 2005. The company forecasts lower sales in the second half of 2005 due to more sluggish economic conditions domestically. Padaeng's net profit was Bt217 million in 2004 and Bt333 million for the first half of 2005.

Padaeng's affiliate Puthep Co Ltd, a joint venture with Pan Australian Resources NL, aims to develop two copper deposits in Loei Province in northeast Thailand: PUT1 (resource of 80 Mt at 0.5% Cu, based on a 0.1% cut-off grade) and PUT2 (resource of 32 Mt at 0.4% Cu, also using a cut-off of 0.1%). Pan-Australian has options to earn and acquire majority control in the joint venture. A pre-feasibility study completed by Pan Australian in 1999 and updated since then indicates that Puthep has the potential to become a viable heap-leach and solvent extraction-electrowinning (SX-EW) copper mine, with the potential to produce over 25,000 t/y of LME grade copper cathode over a period of at least seven years. In June 2004, the Thai Government approved a proposal for a full feasibility study on PUT1 and gave in-principle approval for mining. Pan Australian, listed in Australia, also has projects in Laos: the Phu Bia gold project and the Phu Kham copper-gold project.

The other main copper-sector project in Thailand is being developed by Thai Copper Industries plc. Thai Copper was established in 1994 to build a copper smelter producing 165,000 t/y of copper cathode for the domestic electrical wire and enameled copper wire rod industries. The company is controlled by Mr Prayuth Mahagitsiri, who also controls Thainox (stainless steel). The economic crisis of 1997-98 led to suspension of construction of the Thai Copper plant in February 1998. Construction resumed in January 2003, with the US\$115 construction contract being awarded to Aker Kvaerner asa of Norway to complete the project in 15 months. To resume construction, Thai Copper raised a US\$174 million credit line from a consortium of local banks led by Krung Thai Bank and about US\$79 million in new equity capital from Thai Film Industry (owned by Prayuth Mahagitsiri) and Aker Kvaerner, which provided a loan and new capital in exchange for a 30% equity interest in Thai Copper. The copper smelter and refinery commenced production in September 2004 and is expected to produce approximately 110,000 t of copper cathode in 2005. The company plans to list on the Thai stock exchange although it may need to wait until it has a two-year track-record of profitability.

Thailand imported over 414,000 t of copper metal and copper products in 2004 (worth Bt50.6 billion) and exported just over 112,000 t of copper scrap and products (including 51,000 t of copper scrap and 26,000 t of copper tubes and pipes).

Australian-listed Kingsgate Consolidated Ltd owns and operates the Chatree gold mine in central Thailand through a wholly-owned subsidiary, Akara Mining Ltd. The mine, located 280 km north of Bangkok, commenced operations in 2001. For the year ended June 2005, the mine produced 126,550 oz of gold and 436,194 oz of silver at a total reported cash cost of US\$212/oz. Output in 2004 was 16% lower than in 2003, owing to lower grades and a higher ratio of waste to ore. An expansion in production to 145-150,000 oz/y is planned by the end of 2005 – and the potential to increase to 300,000 oz/y at a cost of US\$40 million is being assessed.

As at June 30 2005, Chatree had total proven and probable reserves of 23.7 Mt at 2.0 g/t Au and 17 g/t Ag for 1.5 Moz of contained gold, sufficient for a mine life of at least ten years at current rates of production. Kingsgate's active exploration programme, costing around US\$9 million per year, is yielding about 1Moz of gold resource discoveries each year and the company expects this rate of exploration success to continue for the foreseeable future. Kingsgate had revenues in

2004-05 of A\$66 million and a net profit of A\$9 million. Gavin Thomas, one of the explorers involved in the discovery of the Lihir deposit in Papua New Guinea, became the new chief executive of Kingsgate in early 2005.

Tongkah Harbor, listed on the Thai stock market, plans to commence operations at a new gold mine near Loei in the first quarter of 2006, with a production target of 50-60,000 oz/y and an expected mine life of at least five years.

Australian-listed Oxiana Ltd is exploring for gold in Thailand through the Thai Goldfields JV. Oxiana has 50% of the joint venture and has options to earn up to 75%. The exploration and drilling programme is focused on certain high-grade, low-sulphidation epithermal gold prospects in the Loei and Phetchabun gold belts near Kingsgate's Chatree mine. In 2004, drilling commenced at two sites: LD and Wang Yai. At LD, gold mineralisation is associated with epithermal alteration and veining along 300 m of strike, open in all directions. Initial drill results have included 9 m at 8.4 g/t Au, 12 m at 5.4 g/t Au and 14 m at 13.4 g/t Au. At Wang Yai, 15 km northeast of LD, bonanza-grade gold-silver results ranging up to 102 g/t Au and 5,000 g/t Ag were obtained from sampling epithermal veins in three separate localities over 1.6 km.

Thailand has a large downstream precious-metals manufacturing and jewelry sector. Thailand imported 156 t of gold metal products and jewelry in 2004 (at a cost of Bt51 billion) and exported 101 t (worth Bt38 billion).

The long decline of Thailand's tin-mining industry continued in 2004, with production of a little over 700 t compared with about 1,000 t in 2003 and 1,700 t in 2002. Tongkah Harbour is the main producer, using contractors to operate dredges in offshore operations. The number of dredges has dropped from three in 2002 to one in 2003. Production ceased altogether in April 2005, and Tongkah Harbour has blamed the government's 20% royalty on tin sales. The royalty is currently being negotiated and if it is revised downwards, the company expects to proceed with exploration of a new offshore area that is expected to contain around 50,000 t of tin.

The Thaisarco tin smelter in Phuket commenced operations in 1965 and its Thaisarco (99.9% Sn) and Phuket (99.85% Sn) tin brands are well known throughout the world. The smelter became part of Billiton in 1972 (at that time, part of the Royal Dutch – Shell group) and more recently, part of the Amalgamated Metal Corporation group. The smelter has a capacity of 36,000 t/y but its production has been running at low levels in recent years primarily as a result of a shortage of concentrates as feed from Indonesia and Peru as production in those countries has become more fully integrated. In 2004, however, production increased to 20,800 t up from 15,400 t in the previous year. Combined with higher tin prices, the value of Thaisarco's tin production was estimated by the Bureau of Primary Industries at Bt6.8 billion in 2004 compared with Bt3.1 billion in 2003.

Thaisarco's slag is used by HC Starck (an affiliate of the German Bayer group) to make tantalum metal powder products. HC Starck (previously Thai Tantalum Co) has a chemical and metallurgical plant located at Map Ta Phut. The chemical plant produces potassium fluortantalate, tantalum pentoxide and niobium pentoxide, and the metallurgical plant produces more than ten grades of high-quality tantalum metal powders using complex technology. Thailand's production of tantalum powders in 2004 was 317 t, worth approximately Bt4.1 billion, most of which was exported.

Industrial minerals

Thailand's limestone production in 2004 was 130 Mt, worth approximately Bt10 billion, up from around 111 Mt in 2003.

Thailand is now second only to China in Asia as a gypsum producer, with production in 2004 amounting to 7.6 Mt. Gypsum exports in the same year totalled around 5.3 Mt (worth approximately Bt2.4 billion). The two main gypsum board producers are Thai Gypsum, owned by

UK-based BPB (the world's leading plasterboard supplier, currently subject to a hostile takeover bid by Saint Gobain) and Siam Gypsum, owned 70% by Lafarge Boral Plasterboard (a joint venture between Lafarge of France and Boral of Australia) and 30% by the Siam Cement Group. Thai Gypsum has the capacity to produce 36 million m²/y of plasterboard at its operations on the eastern seaboard, and is now developing a new 40 million m² line. BPB increased its shareholding in Thai Gypsum from 65% to 100% in the first half of 2004 at a cost of Bt2.5 billion. Thai Gypsum controls between 40-50% of the domestic market (estimated at approximately 55 million m² in 2004) and is a major exporter in the region. Siam Gypsum has 80 million m² of capacity and claims to supply up to 60% of the domestic market. Siam Gypsum has said it intends to double its supply to the domestic market over the next five years.

Asia Pacific Resources Ltd, listed on the Toronto Stock Exchange, directly and indirectly owns 90% of Asia Pacific Potash Corp Ltd (APPC) which, in turn, owns the Udonthani potash concession in northeastern Thailand. The remaining 10% interest is held by the Thai Government. From 1993, APPC conducted exploration in Udonthani Province resulting in the identification of two very significant potash deposits, Udon South, with a resource of more than 300 Mt (ranking as one of the highest-grade potash resources in the world) and Udon North, with an estimated resource of 700 Mt.

The company completed a feasibility study on the Udon South deposit in 1998 and has since been working with the Thai authorities to secure various approvals. The EIA was approved in January 2001 and findings indicated that impacts would be minimal (in line with practical experience in potash mines around the world). APPC plans to develop Udon South at a potash (KCl) production rate of 1 Mt/y, and expects to expand to 2 Mt/y by year six of the operation. Mine life is expected to be around 22 years. Ore will be extracted at a depth of 300-400 m, using standard room-and-pillar underground mining methods, leaving pillars of ore in place as the surrounding ore is removed. Mine cavities will be hydraulically backfilled utilising salt tailings from the surface. A standard flotation process will be used to produce a potash grade of 60.3% K₂O. Part of the potash product will be trucked to domestic markets, substituting the country's current imported potash requirements, and part will be railed to the port of Map Tap Phut for export. The first phase of development will require a capital investment of over US\$300 million. An expansion up to 2 Mt/y would require a further US\$220 million. The company has advised that it is actively seeking strategic partners to develop the project.

The other main potash project, owned by ASEAN Potash Mining Co, is located to the west of the APPC project, in Chaiyapoom Province, and has continued to face problems. The Thai Government (20% stake) has announced its decision to withdraw financial support from ASEAN Potash Mining Co, believing that the project may not be economic. Test shafts found that the reserves averaged just over 10% K₂O (compared with grades of 24% K₂O at Udon South). The Malaysian and Indonesian governments are also shareholders in ASEAN Potash Co (each holding 13%).

A Chinese company, Mingda Potash Corp, registered as a Thai company in 2004 and has applied for a prospecting lease covering an area of 20,150 ha in the Wanorn district of Sakol Nakorn Province. Preliminary estimates indicate potash resources totaling as much as 1,500-2,000 Mt in the lease area and a potential to produce 1 Mt/y.

Other important industrial mineral production in Thailand (based on Bureau of Primary Industries' figures for 2004) includes: kaolin (0.6 Mt), ball clay (0.6 Mt), dolomite (1.0 Mt), feldspar (1.0 Mt), glass sand (0.6 Mt), basalt (9.0 Mt), granite (4.1 Mt) and rock salt (1.0 Mt). Thailand exports the majority of its dolomite production and some feldspar.

Iron and steel

Output of steel products in Thailand increased by 20% to 12.2 Mt in 2004, from 10.2 Mt in 2003. Output was worth approximately Bt268 billion, including about Bt69 billion of exports (2.5 Mt).

Imports of steel and steel products in 2004 totalled 13.7 Mt (worth Bt275 billion), including 5 Mt of billet and slab imports, and 1.8 Mt of steel scrap.

A continued construction boom was the main factor behind the increase in demand for long products, up from 3.5 Mt to 4.9 Mt. Hot rolled coil (HRC) and plate production also increased slightly from 3.3 Mt to 3.8 Mt, but output of other steel products – cold rolled, coated products, pipes and tubes – remained flat. Semi-finished steel output in Thailand increased from 2.5 Mt in 2003 to 4.1 Mt in 2004. The main HRC companies are Sahaviriya Steel Industries (conventional technology, processing imported slab), G-Steel (with EAF technology) and NSM (also with EAF technology). The biggest long products producer is Millennium Steel, with just under 2 Mt/y. Recent press reports suggest that Tata Steel of India may be negotiating to acquire a large shareholding in Millennium Steel. Other rebar and wire rod producers in Thailand include: BSI, BangSaphan, BISW, Nam Heng, TSSI and Tycoons.