

**SOUTHEAST ASIA**

# Strength in diversity

Vast potential across a broad suite of commodities underpins appeal of SE Asian nations

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**R**ich in mineral reserves, many countries in Southeast Asia are ripe for mining, but a number of obstacles continue to hamper their potential for development. Although much progress has been made, Laos, Cambodia, Thailand and Vietnam all continue to face a variety of challenges to their bids to become major mining economies.

**Laos**

The Laos mining sector has experienced a period of tremendous growth, boosting annual production value from about US\$10-15 million in 2003 to more than US\$1.6 billion in 2012. Revenue collected by the Lao government from mine operations has also risen considerably, increasing from less than 1% of government revenue in 2002 to around 16% in 2013. Today, the mining industry is a major backbone of the economy, contributing some 80% of foreign investment, 45% of exports, and providing thousands of jobs.

Most mining companies continue to work in joint ventures, with the remainder either wholly locally owned or foreign-owned. While the majority of the production can be attributed to two companies – PanAust, through its Lao-registered company Phu Bia Mining, and MMG, through Lane Xang Minerals – a large number of small-scale operators have also emerged in recent years.

The moratorium on any new mining investments continues, but the government still allows land sur-



Aerial view of the Phu Kham mine

veys and assessments to be conducted as well as the transferring or selling of mining licences. The government continues to try and tackle the challenge of bringing transparency to the mining industry as it works through the unwieldy task of reviewing existing concessions. Due mostly to unregulated operations, negative environmental impacts, such as water contamination, and social effects are reportedly on the rise.

**Mining and exploration**

Gold and silver operations provide strong cash flow to support dividends and growth for PanAust. The company's Phu Kham operations produced 13,463oz of gold and 75,758oz of silver during the quarter ending June 2014, with total sales of 14,028oz of gold and 97,585oz of silver at US\$1,299/oz of gold and US\$19.8/oz of silver during the quarter.

PanAust's Ban Houayxai gold and silver production increased to 24,734oz of gold in the June quarter, 6% higher than the previous quarter. Gold production is expected to rise in the December quarter to meet production guidance for 2014 at 100,000oz. By contrast, silver production decreased 3% quarter-on-quarter to 190,600oz in June. Sales totalled 22,204oz of gold and 171,463oz of silver at US\$1,326/oz and US\$19.8/oz respectively. PanAust expects to produce up to 160,000oz-165,000oz of gold and 1.2Moz of silver for the whole year from both Phu Kham and Ban Houayxai.

Phu Kham also produced 64,885t of copper in concentrate in 2013 and is expected to reach 65,000t-70,000t of copper production for 2014. In the 2014 June quarter, the operation produced 16,547t of copper, which was 9% lower than the previous quarter, but 7% higher year-on-year. Total copper sales accounted for 17,442t of copper at US\$3.18/lb (US\$7,011/t). PanAust expects copper production to progressively increase to a peak of approximately 90,000t/y with no further development capital required.

The company's most advanced pre-development project is the KTL copper-gold project near Phonsavan in northeast Laos. The satellite deposit offers a low-capital cost option of trucking high-grade copper mineralisation to Phu Kham (100km south) for processing. A revised life-of-mine schedule has KTL feeding ore to the Phu Kham concentrator from late 2015, allowing annual copper production potential to increase to 100,000t/y in 2016.

Further potential is expected via capital efficient brownfield opportunities in Laos. Phu Kham remains a high-priority target for exploration and resource development. Several exploration targets have been identified in a corridor, which includes the Long Chieng Track deposit, which is rich in gold and silver in the northern zone, and gold, silver, and base metals in the southern zone. Nam Ve is one such target and the current phase of exploration drilling was concluded during the 2014 March quarter.

**Snapshot: Laos**

- ▼ **Population:** 6.7 million (2013)
- ▼ **Life expectancy at birth:** 68
- ▼ **Adult literacy:** 72.7%
- ▼ **GDP (current US\$):** US\$11.14 million
- ▼ **GDP growth (annual %):** 8.1%
- ▼ **Inflation, consumer prices (annual %):** 6.4%
- ▼ **Total reserves (includes gold, current US\$):** US\$1.07 billion
- ▼ **Access to electricity (% of population in 2011):** 78%
- ▼ **Internet users (per 100 people):** 12.5
- ▼ **Mobile phone subscriptions (per 100 people):** 66

Source: World Bank

**“Most mining companies continue to work in joint ventures, with the remainder either wholly locally owned or foreign-owned”**

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PanAust is also undertaking regional exploration activities at several identified prospects within the company's contract area of over 2,600km<sup>2</sup> in Laos. The contract area remains underexplored and highly prospective for copper and gold.

It was also a good year for the country's other leading miner, MMG. The company had a record year for copper, once again exceeding the nameplate capacity at its Sepon mine, producing a total of 90,300t of copper cathode. MMG expects to produce a total of 88,000t-93,000t of copper cathode in 2014. The news was less good for gold mining operations at Sepon, which the company was forced to close in December 2013 due to depleting ore, higher production costs and lower margins. The mine played a critical role in helping to develop Laos' economy, having produced 1.2Moz of gold since 2002.

Other miners are also making their mark.

Gold and base metals miner Ord River Resources is in the process of completing the divestment of its 49% interest in the Sarco bauxite and aluminium project in Laos. In early September, an option agreement was signed with Southwest Pacific Bauxite, an emerging bauxite producer with projects in the Solomon Islands and Cape York, Queensland.

The agreement gifts Southwest with exclusive access to complete the transaction over a 12-month period including an US\$300,000 option fee, and a further US\$2 million cash and US\$3 million of Southwest shares or further cash payment if the option is exercised.

Australia-based Kingsgate Consolidated continued primary exploratory activities as part of its Sayabouly project in Laos. Trenching during the June 2014 quarter identified high-grade quartz veins. New channel sample results include 5m at 6.7g/t of gold and 4m at 7.5g/t gold. Additional trenching is ongoing and other quartz veins are noted with assay results pending. This activity is expected to be the precursor to a drill programme planned for late 2014.

Argonaut Resources also has the Century Thrust joint venture with Aurum Resources at the Century concession in northern Laos, which is home to numerous prospect areas and styles of gold mineralisation. Although the concession and related company licences expired in February 2013, an extension application was lodged in November 2012.

Argonaut also holds a 65% interest in the Xekong concession, but announced in May 2013 it would not continue to pursue an extension as it felt the renewal terms were not aligned with the project's stage of development. The shareholders of project operator Xekong River Mining (XRM) have indemnified Argonaut against potential losses under Lao law.

A number of companies have decided to look further afield. Chinalco Yunnan Copper Resources (CYU) and its 51% Chinese-registered subsidiary Yunnan Copper San Mu Mining are also seeking offers for the purchase of its project interests in northern Laos – the Zinzhai project in the Phongsaly province and the Juizhai project in the Oudomxay province – as it seeks to refocus its efforts on Australia.

No offers have been received yet and steps are being taken to abandon the projects, a process that may take several months to finalise with the country's mining authorities.

**“MMG had a record year for copper, once again exceeding the nameplate capacity at its Sepon mine”**

### Cambodia

The mining sector in Cambodia is still undeveloped compared with other countries in the Indochina region, though the country's potential resources remain attractive to domestic and global miners. These resources comprise copper, gold, iron ore, zinc, lead, tin, bauxite, sapphire, ruby, kaolin and limestone, which are mainly located in the north-east of the country in the Monduliri, Ratanak Kiri and Kratie provinces.

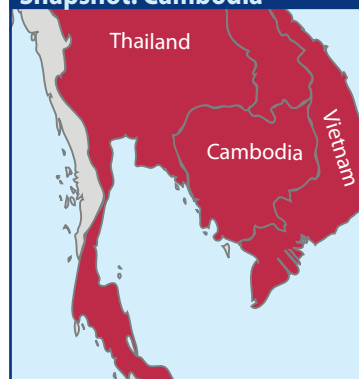
Most active mining produces materials for construction with small-scale quarries, such as marble, granite, gravel and sand, but metallic mineral projects have yet to be developed into commercial mines. The Cambodian government encourages investment in the mineral sector and allows for 100% foreign invested companies to own the mining licences. However, global miners are still hesitant to enter the market due to inadequate regulations, poor infrastructure, lack of transparency, uncertainty of exploitable mineral resources, and the lack of successful mining stories to date.

The government is in the process of drafting a law designed to govern safety standards in mining. This would be the first significant amendment since 2005 and to the 2001 Law on Management and Exploitation of Minerals Resources. The Ministry of Industry, Mines and Energy (MIME) is the lead management body for Cambodia's mineral sector.

A number of miners are making progress in their exploration activities. After a promising finding in its Okvau gold deposit in Monduliri in 2013, which yields an indicated and inferred resource of 15.6Mt at 2.4g/t Au for 1.2Moz, Renaissance Minerals has started to expand its exploration activities further to the north of Okvau where it has found positive

► **Continues on page 18**

#### Snapshot: Cambodia



- ▼ **Population:** 15.14 million (2013)
- ▼ **Life expectancy at birth:** 71
- ▼ **Adult literacy:** 74%
- ▼ **GDP (current US\$):** US\$15.25 billion
- ▼ **GDP growth (annual %):** 7.5%
- ▼ **Inflation, consumer prices (annual %):** 2.9%
- ▼ **Total reserves (includes gold, current US\$):** US\$5 billion
- ▼ **Access to electricity (% of population in 2011):** 34% (2011)
- ▼ **Internet users (per 100 people):** 6
- ▼ **Mobile phone subscriptions (per 100 people):** 134

Source: World Bank

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results in Area 1, Okvau North, Okvau North-West and Samnang prospects. In addition, a high density of rock chip samples containing gold in the Rhyolite Ridge prospect located in the west of Okvau implies a high likelihood of new discoveries for Renaissance.

After buying the exploration rights for the Phum Syarung gold prospect from Angkor Gold in 2013, Mesco Gold, an associated company of Mesco Steel, applied for a mining licence in early 2014 from the MIME, but this is still pending approval.

Mesco agreed to pay Angkor an additional US\$700,000 for the expanded exploration area of 6km<sup>2</sup> and a mineral tax based on actual gold production. If approved, it is hoped this will encourage more foreign players to seek new opportunities in Cambodia. An assay completed on dump grab samples indicated the presence of gold at 2.03g/t, silver at 28.7g/t, and copper at 0.9%.

Capital Mining has rejected the acquisition of the Ratanak Kiri gold project located in the northeast of the country from Indochine Mining and withdrawn from the joint venture agreement with Indochine Resources to acquire 90% of Ratanakiri Consultancy, which also holds gold tenements in Cambodia.

Due to these failed negotiations, Indochine Mining has applied for the third extension of its gold tenements. However, the application has not yet been approved by the MIME.

Brighton Mining Group has sustained its gold exploration activities. It continues to achieve promising results from its second round of exploration at 223 sample holes in the Kang Roland North concession that yielded peak assays of silver at 4.76g/t. The group also plans to acquire Asia Minerals as part of its drive to become an integrated manganese miner and trader. The group is also attending a bid to acquire Brighton Mining, which partially owns the Kang Roland South and Ouyadav concessions with Summer Gold.

### Thailand

With coal prices remaining soft, Thailand-listed Banpu Public Company (Banpu PCL) has continued to implement cost-cutting measures and productivity improvements. The company is focused on developing its Hongsa power project, which is expected to offer key synergies with Banpu's asset portfolio while delivering economic and social benefits in Thailand and Laos. The coal-fired power project in Xayaboury, Laos, is now 89% complete with the commercial operations date for the first unit scheduled for June 2015.

The average selling price for Indonesia coal fell 12% from US\$77/t in 2013's June quarter to US\$68/t in this year's June quarter, 4% from US\$70/t to US\$67/t for Australia Coal, and 30% from US\$90/t to US\$63/t for China coal.

Due in large part to significant earnings growth in Banpu's power segment, the company achieved 49% net profit growth in this year's June quarter compared to the same quarter in 2013. However, due to a 68% drop between this year's March quarter and June quarter net profit for Indonesia coal, the company experienced a 62% quarter-on-quarter net profit drop.

### Snapshot: Thailand



- ▼ **Population:** 67 million (2013)
- ▼ **Life expectancy at birth:** 74
- ▼ **Adult literacy:** 96%
- ▼ **GDP (current US\$):** US\$387.3 billion
- ▼ **GDP growth (annual %):** 1.8%
- ▼ **Inflation, consumer prices (annual %):** 2.2%
- ▼ **Total reserves (includes gold, current US\$):** US\$167.2 billion
- ▼ **Access to electricity (% of population in 2011):** 99%
- ▼ **Internet users (per 100 people):** 28.9
- ▼ **Mobile phone subscriptions (per 100 people):** 138

Source: World Bank

Banpu's chief executive (CEO), Chanin Vongkusolkrit, recently announced that the company expects no growth in coal sales this year. The CEO notes that the company is maintaining a full-year revenue target of US\$3 billion as coal prices have bottomed out and remain at an acceptable level around US\$70/t.

The company's Indonesia, Australia, and China coal operations reached a June quarter total production volume of 12.7Mt. The 2014 output targets total 48.7Mt, specifically 29.5Mt for Indonesia, 15.6Mt for Australia, and 3.6Mt for China.

Kingsgate Consolidated is focusing on operating efficiencies and cost-reduction initiatives. The company operates the Chatree gold mine project in central Thailand via its subsidiary Akara Resources.

Kingsgate is targeting gold production to reach 134,546oz at the Chatree project. Combined with the 74,954oz of gold production expected at the company's Challenger project in southern Australia, this would lead to a record total annual gold production of 209,500oz. The company expects to produce between 130,000oz and 140,000oz of gold at Chatree in 2015 and continues to pursue exploration and mineral enhancement targets within the granted mining leases at the project.

Kingsgate also has two development projects further afield - the Bowden silver mine in Australia and its Nueva Esperanza gold and silver mine in Chile. The company maintains a focus on optimising facilities over time, particularly in conjunction with plans to list Akara on the Stock Exchange of Thailand (retaining a 49% interest) and fund development projects.

Australia's Matsa Resources continues in its bid to start exploration at its Paisali Iron Ore, Siam Copper, and KT Gold projects. 124 Special Prospecting License Applications (SPLAs) related to the projects are under review, but there are no indications of when or if the applications will be approved.

**“Mesco Gold also entered into a new agreement this year with Angkor to acquire the rights for its expanded exploration area in the Phum Syarung prospect”**

## Vietnam

Vietnam is among the most resource-rich countries in the region. Mining and quarrying contributed around 11% to the country's GDP in 2013. According to the Ministry of Planning and Investment, more than 5,000 mineral deposits with over 60 kinds of minerals have been identified. The resources are scattered throughout the country, and many have high economic value. With the exception of coal, bauxite and titanium, most discovered deposits have been reported in scales that most global miners would not consider economically viable. As of 2013, there were more than 4,320 mining and exploration licences issued. Although Vietnam has strong potential, it is still affected by illegal mining, which has taken a particular toll on coal, titanium, and gold. Also, limited environment protection has had a negative effect.

Mining legislation and taxation policies have been updated over the past 12 months. The Ministry of Industry and Trade supplemented new areas into the zoning plan for exploration, exploitation, production and consumption of gold, copper, nickel, molybdenum, chromite and manganese.

The Standing Committee of the National Assembly issued Resolution number 712/2013/UBTVQH13 on December 16, 2013, to increase royalties for a number of minerals. The increase by 2-5% for metallic minerals and by 1-3% for non-metallic minerals was effective from February 1, 2014. A government decision dated November 28, 2013, also regulates the fee for obtaining mineral mining rights at 1-5% reserves value. It took effect on January 20, 2014.

## Coal

State-owned Vietnam Coal & Minerals Industries (Vinacomin) controls Vietnam's coal sector and is responsible for nearly 95% of the country's coal pro-



**Canadian gold miner Besra Gold holds more than 80% of the shares in Vietnam's two largest gold mines**

duction. It operates 54 coal mines and 30 of them are underground. This year Vinacomin planned to reduce coal production from 39Mt in 2013 to just over 35Mt in 2014, with 7.5Mt of the coal being exported and 28Mt being consumed domestically.

According to the National Power Development Plan VII (PDP7) approved in 2011, coal is expected to be the main fuel for the country's future power generation. Demand for coal should increase by at least 10% year-on-year. In contrast to the demand for coal, domestic coal supply is expected to increase steadily at 2%/y due to limited coal reserves. Hence, this will create a coal shortage and a requirement for importing coal in the near future.

Since a number of coal-fired power plants lag behind the PDP7 schedule, prime minister Nguyen Tan Dung instructed national power producers Vietnam Electricity Group (EVN) and Vietnam Oil & Gas Group (PVN) to work closely with Vinacomin to adjust the plan for importing coal and complete coal supply agreements as soon as possible.

In response, PVCoal (under PVN) and Coalimex (under Vinacomin) recently signed initial framework agreements with foreign coal producers such as Australia's Ensham Resources and Bukit Asam and Prima Multi Minerals Indonesia.

The plan for importing coal in 2015 has been delayed to 2016 or 2017. To meet domestic coal demand in 2015, the prime minister adjusted the production plan for numerous coal mines to ensure they meet local demand.

## Bauxite and alumina

Vietnam's proven bauxite reserves are estimated at 7,800Mt, ranked fourth globally just after Guinea, Australia and Brazil. The total reserves, after being fully explored, could further surge to 10,000Mt as reported by the Ministry of Natural Resource and Environmental (MONRE). Most of this is bauxite, accounting for more than 90% of the country's bauxite reserves, is distributed in the Central Highlands region such as Dak Nong, Lam Dong, Gia Lai, Kon Tum while the diaspora-rich bauxite is distributed in the north of Vietnam, mainly in Cao Bang, Lang Son, and Ha Giang provinces.

Tan Rai is the first established alumina refining plant in Vietnam, which is operating at 85-90% of its design capacity or 650,000t/y. Nhan, the second established alumina refining plant, is under construction and expected to start supplying 650,000t/y of alumina in 2015. The two plants are both located in Dak Nong, a province containing the largest bauxite reserves of up to 5,000Mt after full exploration. In October 2014, the Tan Rai plant started producing red sludge that could have seri-

## Snapshot: Vietnam



- ▼ Population: 89.71 million (2013)
- ▼ Life expectancy at birth: 76
- ▼ Adult literacy: 94%
- ▼ GDP (current US\$): US\$171.4 billion
- ▼ GDP growth (annual %): 5.4%
- ▼ Inflation, consumer prices (annual %): 6.6%
- ▼ Total reserves (includes gold, current US\$): US\$25.9 billion
- ▼ Access to electricity (% of population in 2011): 96.1%
- ▼ Internet users (per 100 people): 43.9
- ▼ Mobile phone subscriptions (per 100 people): 131

Source: World Bank

**“With coal prices remaining soft, Banpu Public Company has continued to implement cost-cutting measures and productivity improvements”**

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ous impacts on the environment. The company is now being monitored by local communities.

In 2009, Alcoa withdrew investment interests from both the Tan Rai and Nhan alumina refining plants, owned by Vinacomin. However, at the outset of 2014, Alcoa and Vinacomin met to discuss Alcoa's willingness to co-operate with Vinacomin to improve the performance of bauxite production in Vietnam.

Private Vietnamese company Tran Hong Quan Trading broke ground at its Dak Nong aluminum smelter within the Tan Rai-Nhan bauxite-alumina complex in September 2014. The investment costs approximately US\$500 million and is expected to have a production design of 350,000t/y-450,000t/y of finished products once completed. Commercial operation of the first phase is expected to start by the end of 2016 or early 2017.

After five years eyeing up bauxite in Vietnam, Australia's Atlantic Company has announced it will stop looking for opportunities in the country.

### Titanium and zircon

According to MONRE, total titanium and zircon resources in Vietnam could be as much as 650,000Mt and 80,000Mt, respectively. 90% of titanium and zircon are concentrated in the Binh Thuan province. Titanium exploitation plants are mostly scattered across the regions where titanium reserves are concentrated such as Binh Thuan, Binh Dinh, Thai Nguyen, Hue, Quang Nam and Quang Tri.

There are just two reverted ilmenite factories with capacity of 20,000t/y, five slag smelters (phase one) capacity of 64,000t/y and 11 processing lines of zircon and rutile. According to the US Geological Survey (USGS), total titanium-zircon production in Vietnam has risen from about 500,000t/y to more than 1Mt/y within a decade.

### Gold and copper

There are small reserves of gold in Vietnam, equivalent to around 154t. Currently, Canadian gold miner Besra Gold holds more than 80% of the shares in two gold mines in Quang Nam – Phuoc Son and Bong Mieu – which are considered to be the largest gold mines in the country. Production at the two mines reached 60,187oz in 2013.

The company was originally targeting gold production of 70,000oz in 2014, but this seems increasingly unlikely given its decision to suspend operations at both mines in November last year, purportedly to repair roads damaged by storms and floods. However, there has been speculation that the suspension was related to a recent decision by the government to increase the mineral tax on gold production.

After a ten-month hiatus, Besra restarted operations at Bong Mieu in September 2014. The company is still awaiting the outcome of the government's deliberations regarding reopening Phuoc Son.

In December 2012, there was 50Mt of copper ore explored in the Sin Quyen copper mine, which is operated by Vinacomin subsidiary Sin Quyen Cop-

per Company. Following this exploration, total reserves in Sin Quyen reached 106Mt. As a result, the mine is due to more than double its capacity from 1.2Mt/y to 3Mt/y.

At the beginning of 2014 Nui Phao Mineral asked permission from the government to outsource 90% of its copper ore for refining in Korea, Japan, and the Philippines in order to meet local demand.

### Iron ore

According to geological surveys, there are more than 216 iron-ore deposits throughout Vietnam. The Vietnam Steel Association (VSA) estimated that Vietnam has over 1,300Mt of iron-ore reserves, potentially rising to 2,000Mt (in which 13 iron-ore mines have more than 2Mt of reserves). The Quy Xa mine in Lao Cai and Thach Khe mine in Ha Tinh are the largest mines where reserves are roughly 120Mt and 544Mt, respectively.

Iron-ore exports have been prohibited since 2012 under Decree 15/2012/ND-CP dated March 9, 2012. Two years on and the domestic supply of iron ore has decreased, leading to a decrease in the commodity's price and an increase in the inventory level; thus, the Ministry of Industry and Trade has now allowed businesses to export iron ore once again. However, with the current growing demand, the Vietnam Steel Association recently recommended the government should halt iron-ore exports to ensure demand for domestic steel production.

In early 2014, the Hoa Phat Group, a market leader in the long steel market, established Nam Giang Mineral Company, which will be responsible for exploiting an iron ore mine in Nam Giang in Quang Nam province. Hoa Phat is also exploiting iron ore in Ha Giang and Ha Tinh province.

### Rare earths

Vietnam is home to the third-largest supply of rare-earth reserves in the world. According to the USGS, the country has nearly 17Mt of rare-earth reserves, placing it just behind Brazil, which has 22Mt, but well behind China, which has an estimated 55Mt. The Nam Xe area is believed to have the largest rare-earth reserves – as much as 12Mt – which make up 70% of the country's total reserves.

In June 2014, Shin-Estu Magnetic Material received the investment certificate to invest in manufacturing a rare-earth magnet plant project with US\$100 million capital investment. The plant was expected to start construction in October with a design capacity of 3,300t/y and will be commissioned by the end of next year.

As an essential material in the electronics industry, licensing and exporting rare earths must be approved by the prime minister as stipulated in Decree 15. To date, Japan is the largest investor in Vietnam's rare-earth industry. In fact, the only rare-earth exploitation company that exists in Vietnam is Lai Chau Rare Earth, which is a joint venture between Japan's trading companies Toyota Tsusho and Sojitz and Vietnamese firm Lavreco. ▼

**“Vietnam is home to the third-largest supply of rare-earth reserves in the world”**

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