INDONESIA

By Ir. Achmad Prijono

Political upheavals which rocked Indonesia during 1999 didn't show any sign of subsiding in 2000, even with the ascent of the democratically elected new, former clergyman, President Abdurrachman Wahid, better known as Gus Dur, in October 1999. On the contrary, political infighting within the so-called political élite, frequent demonstrations by various groups as well as clashes among several communal and ethnic groups, were the order of the day. A positive development was that the religious conflict in the Moluccas, especially north Moluccas, had much abated.

At the start of his term of office the public had high expectations of Wahid that, once, having taken the helm, he would speed up the transformation to democracy and abolish KKN (the Indonesian abbreviation for corruption, collusion and nepotism) these have been far from realised. On top of this, the many erroneous and controversial statements of the president and his confusing and erratic style of governance have exacerbated the situation.

His indecisive, compromising attitude towards the separatist movements in Aceh and Papua (formerly Irian Jaya), where stern measures should have been taken to uphold the sovereignty of a united Republic of Indonesia, has created an unruly and unstable situation.

This more or less disorderly condition spilled over to other regions where local people and mining labour, interpreting human rights and democratisation according to their own ideas and individual and/or clique interests, had harassed and in some cases temporarily halted operation of some of the CoW mines, such as PT Newmont Minahasa (north Sulawesi), PT Kaltim Prima Coal, PT Indomuro Kencana and PT Kelian Equatorial Mining in east and central Kalimantan.

Even the state-owned PT Bukit Asam's Ombilin coal mine, in west Sumatra wasn't spared and some parts of the open-pit mines had been invaded and occupied by local people in west Sumatra.These had not only inflicted financial losses on the mining companies concerned and reduced income from royalty and tax to the government, but the image of Indonesia with foreign investment was greatly tarnished. The bright side of the coin is that there are clear signs in 2000 that the Indonesian economy is on the way to recovery.

The economy in 2000 – after three years of recession - had grown by 4.8%. This higher than expected growth rate was caused, in the first place, by the considerable escalation of oil and gas export prices. Export revenue from this sector had increased 45.4% from the previous year's export figure, to US$14.24 billion.

It was also greatly helped by the revival of domestic industry, which can be shown from the increased imports of raw material and capital goods since the previous year as has been reported. Altogether, exports of the so-called non-oil and gas products rose by 22.9% resulting in an overall national export amount of US$62 billion in 2000 (a new annual export record) or an increase of 27.4% over the past year's figure.

A structural change in export commodities was noticed where the export value of machinery and electronic products dominated the other export commodities, surpassing wood and wood products which, in past years, was the chief earner in the non oil/gas commodity sector. The inflation rate of 9.35% was higher than the previous year's figure of 7.34%, but was kept below a two digit figure.

Although the above economic indicators were promising, the economy is still very fragile and vulnerable to political turmoil on the domestic scene. Of much concern is the continuing decrease in the rupiah value against the US dollar. While the rupiah was relatively strong and stable in the March quarter of 2000 at an average of Rp7,500 to the US dollar, since April 2000 it had declined from Rp7,590 to around Rp9,400/US$ at the end of the year, while in early March 2001 it had plunged to over Rp10,000/US$.

Many have blamed this continuous depreciation of the rupiah to non-economic factors. In particular the adverse and lengthy political dispute between the president and parliament, which had escalated with the issuing of the First Memorandum of Censure by the parliament at end January 2001, and the failure of the government to address mounting domestic problems. Also the on going civic unrest in many places.

Inevitably, this weakening of the rupiah had a disastrous effect on the state budget of 2000 which allocated Rp23.1 trillion or US$2.95 billion for debt servicing, based on an exchange rate of Rp7,800 to the US dollar.

With an overall debt of over US$140 billion at the start of 2001, US$74.2 billion of which are government debts and an exchange rate of over Rp10,000/US$, by March 2001, such unfavourable monetary conditions would undoubtedly forebode a large deficit for the announced 2001 budget plan and may push interest rates and inflation further upwards, slackening the business sector and hampering recovery of the economy.

As was reported in the previous edition of *Mining Annual Review* (MAR), the bank restructuring programme, which had been entrusted to Indonesia Bank Restructuring Agency (IBRA) to raise cash, Rp27 trillion for this year, to help finance the budget deficit by selling the assets from ailing banks and the privatisation of state companies, had performed far below target.

It is therefore anticipated that the economy in 2001 will slow down, exacerbated by the rise in fuel prices per April 1, 2001 and the looming increase of electricity prices in the next few months. This in turn would have a bearing on the pace of economic recovery.

In spite of disturbances at several mining sites, four of the five most significant Indonesian mineral commodities managed to show an upward production trend in 2000 ie coal, copper in-concentrate, nickel in-matte, in-ferro-nickel and tin in-concentrate while gold remained steady. The above four metal mining commodities plus coal had, in 1999, generated a revenue of US$3.77 billion or 98% of a total of US$3.83 billion in sales revenue (figures for 2000 have not been issued). Coal is still moving ahead with a production of 76.5 Mt - a new national record - and an export of 57.7 Mt, which is the highest level to date.

With the first full year production of Newmont's Batu Hijau mine in south west Sumbawa Island, which started commissioning at end 1999 and the steady production of the PT Freeport mine at Tembagapura, Irian Jaya, overall Cu-concentrate production rose considerably.

Total Cu-concentrate output of both mines reached 3.27 Mt - 2.52 Mt from Freeport and 744,000 t from Newmont's Batu Hijau mine - or up by 25.4% from the total amount of the previous year. Cu content in the above concentrates, for the first time, has exceeded the 1 Mt level, with Freeport contributing 776,000 t and Batu Hijau 236,000 t, heralding Indonesia's entrance into the league of over one million ton copper (mine) producers, and lifting the country's ranking to third in the world, after Chile and the US.

Nickel in 2000 has also shown an excellent performance. With the completion of the expansion programme in late 1999 (see MAR 2000), Inco reported a massive production increase of 30% over the former year, reaching an output of 59,200 t Ni in-matte. PT

Aneka Timbang's (Antam) Ni production in ferro-nickel had also increased to 10,111 t, an increase of 10% over the former year.

Total nickel ore production from Antam's nickel laterite mines however, was down by 6%. This was partly caused by the conflict in north Moluccas which affected the Gebe nickel mine (located southeast from the island of Halmahera) and the excessive rainfall during the year. In the June quarter of 2000 production at Gebe was on track again.

Despite the harassment from local people at the gold mines in Kalimantan and north Sulawesi, overall gold production was surprisingly stable at 127.2 t, slightly down from the previous year's 129 t, while silver increased to 314 t or up by 7.4% over the previous year's level.

Production output of gold mines in Kalimantan and east Indonesia was only slightly affected by the unruly local conditions. Besides, new production of gold was coming from the newly opened Batu Hijau copper mine, which had contributed an additional 9.95 t of gold by-product and from the newly commissioned Gosowong mine at Halmahera which contributed 7.8 t of the yellow metal. While Aneka Tambang's Pongkor mine in west Java managed to increase gold production to 4.02 t an increase of 36% over the 1999 production level of some 2.96 t.

As reported in former issues of MAR, the lion's share of gold production, as in the years before, came from PT Freeport's associated gold production in Irian Jaya, which in 2000 had produced 77.12 t of contained gold as by-product, but this was substantially lower than the previous year's output of 92.8 t.

The promulgation of Law number 22, 1999 regarding regional autonomy and, as planned, implemented on January 1, 2001 to transfer authorisation and management of mining contractors (foreign as well as domestic) to regional governments, had soon shown some negative excesses as was feared. The above law was implemented without adequate preparation and clear guidelines because the implementation rules are lacking ie the roles and responsibilities of the regional government with regard to existing and new mining investments, formerly determined by Jakarta.

To boost much needed local income some regions have issued regulations, which are counter productive and may frighten off new mining investment.

Consistency of law is a must to attract foreign investment and arbitrary acts by the local government to increase the region's earnings, without observing the agreed articles in the basic CoW, are certainly not conducive to an attractive investment climate and may hamper mining development in the future.

Coal

Production and export of coal from 19 producing mines in 2000 had respectively increased to 76.5 Mt (up 3.7%) and 57.7 Mt (up 4.3%), despite some labour harassment at PT Kaltim Prima Coal's Sangatta mine in east Kalimantan which recorded production losses of some 2 Mt. But this was fully compensated for by production increases from other first-generation as well as from production pick-up by second-generation coal mine contractors, seven of which had reached the production stage in 2000.

Over the past 20 years, even during the monetary crisis from 1997 to 1999, coal continued its uninterrupted upward trend of production and export at an unprecedented annual rate of 31% and 36.6% respectively. A helpful incentive was the improved coal prices in the second half of the year, which motivated coal miners to increase production and export.

In 1999 according to BP's Statistical Review of World Energy (June 2000) Indonesia had emerged as the tenth largest coal-producing country in the world and most probably will remain at that level in 2000.

As reported before, Indonesia ranks third worldwide in the export of steam coal. In early January 2001, another three fourth-generation CoW coal contracts - all domestic investments - have been signed with the Department of Mines. One of the above three contractors namely, PT Mahakam Sumber Daya, will exploit the Separi Santan area, a former area of PT Kaltim Prima Coal, which had been voluntarily surrendered to the government - a very laudable act from the foreign contractor - earlier in the year.

Unlike the earlier generation contractual tax arrangements, which are fixed - or 'nailed down' - during the contract lifetime, the tax provisions for the fourth-generation contracts are changeable, subject to newly introduced government tax regulations.

As of early 2001, a total of 112 coal contracts comprising first, second, third and fourth generation contracts with foreign as well as domestic investors have been signed. Of the above amount, nineteen companies have reached the production stage. Recorded sales revenues from the several mining companies for 2000 are not available yet, but coal in 1999 had emerged as the largest revenue earner in the mining sector (outside oil and gas) with US$1,216 billion, outnumbering copper sales of just over US$1 billion.

Indonesian coal resources in 2000, according to a recent announcement by the Directorate of Coal stood at 38.9 Bt. A new awareness among the energy policy makers is that more attention should be given to the exploitation of the low-rank coals, which make up 60% of Indonesian coal reserves, as fuel for mine-mouth power plants to cope with the increasing power demand. In 2000 electricity demand increased by 11% and growth is expected to continue unabated in the next few years, barring unforeseen circumstances such as a second monetary crisis. The planned privatisation of PTBA in mid-2000 did not go ahead since preparation work took longer than expected.

After due tender proceedings, the Indonesian Bank Restructuring Agency (IBRA), which took over the coal assets of Indocoal of the Salim group as part of its debt settlement to the government, appointed Banpu from Thailand and PT Centralink Wisesa, Banpu's local partner, as the winning bidder with an offer of US$45 million to acquire Indocoal's coal assets. These assets consist of two operating mines - PT IndomInco Mandiri and PT Kitadin (east Kalimantan) - and two coal projects, that are in the pre-production stage, one in east Kalimantan and one in south Sumatra.

Banpu from Thailand, which teamed up with Centralink, already operates PT Jorong Barutama Greston's coal mine in south-east Kalimantan and another coal project, ie Mumpun Pandan, in central Sumatra.

PT Kaltim Prima Coal (KPC) coal production in east Kalimantan was, in the last half of 2000, adversely affected by repeated strikes of mine workers of the SBSI (a labour organisation with its headquarters in Jakarta) who were pushing for higher wages. These strikes, which in total had taken a toll of 44 working days between May and August, caused the loss of around 2 Mt in annual coal output, aside from payments of demurrage charges to the ships that were unable to load coal on arrival at Tanjung Bara (the company's coal harbour).

The strikes not only affected KPC, but also the Indonesian Government, which is entitled to receive a 13.5% production royalty from the coal contractors. KPC's daily production in the March quarter of 2001 at 25,000 t/d was still half the usual capacity of 50,000 t/d. By the end of March, the mine was able to raise production to 35,000 t/d but another strike – by the same labour organisation – struck KPC's mining contractor, PT Liebherr, which operates the giant mining excavators.

This time the company received the full support of the regional government and the Sangatta community who were now fully aware of the adverse effect such strikes have on the local economy and therefore condemned those actions.

From a national coal production point of view though, the above losses in production were more than compensated for by the increased production tonnages from the other first - generation coal contractors such as PT Kideco Jaya Agung, which in 2000 produced 8.04 Mt (up by 700,000 t from 1999), PT Adaro Indonesia producing 15.48 Mt (up by 1.88 Mt), PT Berau Coal producing 4.88 Mt (up by 1.6 Mt) and PT IndomInco Mandiri producing 3.47 Mt (up by 420,000 t).

In addition, the following second-generation coal contractors recorded increases in production: PT Gunung Bayan Pratama with a production of 1.34 Mt (up by 300,000 t), and newcomers, PT Jorong Barutama Greston and PT Sumber Kurnia Buana, with 1.19 Mt and 458,000 t respectively. Exports of coal amounted to 57.7 Mt, up by 4.3% from 1999.

Significant importing countries of Indonesian coal in 2000 were: Japan with 12.53 Mt, Taiwan with 12.07 Mt, South Korea with 4.7 Mt, the Netherlands with 3.45 Mt, Spain with 2.87 Mt, the Philippines with 2.77 Mt and India with 2.6 Mt. Indonesian coals were also exported to the US (659,000 t), Chile (718,000 t) and Brazil (427,500 t).

The above coal production and export increases have shown one remarkable fact, namely that companies possessing relative low calorie coals (around 5,500-5,800 kcal/kg), high moisture content (18-25%), low ash (2-3%) and sulphur (0.1-0.3%) content such as PT Adaro Indonesia, PT Berau Coal and PT Kideco Jaya Agung, are at the forefront of those production/export increases and are still moving ahead steadily. These so-called ‘green’ coals have lately gained much acceptance with consumers for blending purposes.

In 2000, PT Adaro Indonesia become Indonesia’s largest coal producer with 15.5 Mt, replacing PT Kaltim Prima Coal, which ranked first in 1999. For 2001, PT Adaro has set a target of 19 Mt.

March 2000 marked the first closure of one of the first-generation coal contractors, namely PT Allied Indo Coal, operating in the Parembahan area near Ombilin, west Sumatra. The company, which produced around 1 Mt/y had to cease production due to exhaustion of reserves after 14 years of operation.

Nevertheless, increases in coal production from the first-generation contractors, as well as from the second-generation contractors, are still predicted for the years ahead. This year coal production of over 80 Mt and exports of over 60 Mt are likely.

Nickel

Indonesia’s two nickel producers in Indonesia, ie PT Inco Indonesia at Soroako and Antam at Pomalaa, Gebe Island and Gee Island (western Halmahera) both experienced a very lucrative and booming operational year in 2000.

The expansion of capacity by PT Inco, which also included the construction of a 93 MW hydroelectric plant at Balambano, was completed. As a result nickel (in-matte) production rose by 30% to 59,200 t, an all-time high.

The targeted capacity was 68,000 t, but some technical problems, ie a slag dump failure and reduction kiln shutdowns, prevented this from being realised. The booming nickel market in 2000 boosted Inco’s average received nickel price by 47% to US$3.06/lb, from a 1999 average of US$2.08.

Despite the significant rise in output and the resulting increase in sales revenue from US$209.4 million in the previous year to US$401.6 million in 2000, which resulted in a net profit of US$80.5 million (nearly four times the previous year's figure of US$21.3 million), no dividends will be paid by PT Inco.

Scott Hand, Inco's president explained, during an annual shareholders' meeting of PT Inco held in April 2000 in Jakarta, that the indebtedness incurred to complete the expansion project, combined with a tight credit market, would continue to put constraints on Inco's cash position. To maintain sufficient cash on hand, dividend payments would thus be withheld.

PT Inco's proven and probable ore reserves in the Soroako area at year-end were 101 Mt with an average grade of 1.82% Ni. Nearby resources within Inco's CoW area include Bahudopi near the Gulf of Tolo and the Pomalaa-East deposit, just east of Aneka Tambang's Pomalaa nickel unit working area in southeast Sulawesi. These two nickel deposits have the potential to be developed and operated for many decades to come.

Antam which operates the nickel mine and ferro-nickel smelting plant at Pomalaa, the two nickel ore mines at Gebe Island, north Moluccas, and Gee Island, just offshore to the west of mainland Halmahera in the Bay of Buli, also had a very profitable operational year.

Nickel, gold and silver, which form the main income earners for Aneka Timbering, plus earnings from other mineral commodity products such as bauxite and iron sand, yielded Antam a net profit of Rp383 billion, 64% higher than the 1999 total of Rp234.3 billion.

Production of nickel in-ferro-nickel increased by 9.7% to 10,111 t from 9,221 t, but nickel-ore output decreased by 200,000 t to 3,038,869 t as a result of the turmoil on Halmahera Island, which caused some labour unrest at Gebe Island, located just 90 km to the southeast. Part of the workforce left the island, but in the second half of 2000 production resumed at a normal level.

The lower ore production was partly compensated for by production increases of saprolite ore from the Pomalaa and Gee Island mines. Of the total ore production of 3.04 Mt, some 2.11 Mt comprises saprolite and 930,000 t limonitic ore. Production of the latter dropped by 19% since all limonite ores are mined at Gebe.

Exports of saprolite ore - mainly to Japan - after deduction of the amount needed to feed the Pomalaa ferro-nickel plants, amounted to 1.24 Mt, an increase of 20%. Exports of limonitic ore, mainly to the Yabulu nickel plant in Queensland, Australia, dropped by 24% to 800,000 t.

As reported before, Antam has two nickel joint-venture projects, PT Gag Nickel at Gag Island (Irian Jaya) with BHP in association with Falconbridge, and PT Weda Bay Nickel in central Halmahera with Strand Minerals Ltd.

The PT Gag Nickel project experienced some delay, because Gag Island falls under Forestry Law No. 41/99, which has classified Gag Island as a protected forest and thus prohibited to mining activities. In fact, the government had assured mining firms that the Forestry Law was not binding on firms with exploration permits issued before 1999. However, such assurances had little effect in the field, where local officials were interpreting the law to the letter.

BHP has rightly asked for an official confirmation on this matter before it proceeds with the construction of the project. Also, the initial plan to construct an integrated pressure acid-leach (PAL) plant cum refinery producing Ni and Co metal on site had been modified and reduced to a PAL plant only, producing a combined nickel-cobalt sulphide product to be shipped to Falconbridge's refinery in Canada.

BHP and Falconbridge each have a 37.5% stake in PT Gag Nickel and are still negotiating with Antam (with a stake of 25%)

to adjust the joint-venture agreement to the new plan and resolve some other vital issues.

PT Weda Bay is continuing with its exploration programme, which includes a more extensive drilling campaign (with 100 m intervals between drilling points) at the Santa Monica deposit, to come up with sufficient proven reserves. Additional discoveries of lateritic nickel ore at the Santa Monica and Big Kahuna areas have increased overall indicated and inferred resources to 202.3 Mt at a grade of 1.37% Ni and 0.12% Co.

Antam's ferro-nickel III project with a projected capacity of 13,000 t/y of nickel in-ferro-nickel, is still awaiting completion of the final details of the loan funding and the project financial closure. Tessag INA GmbH of Germany has been appointed as the nominated Engineering, Procurement and Construction (EPC) contractor for this ferro-nickel expansion project. Total cost of the project is expected to reach US$220 million. The increased fuel prices starting April 1, 2001 would undoubtedly add to the project's costs. To overcome this disadvantage, Antam plans to reduce ore transportation costs by mining a closer saprolite deposit at Bahubulu Island in the Gulf of Lasolo, to the northwest of Kendari, the capital of southeast Sulawesi.

By the end of 2000, a systematic drilling campaign on the Bahubulu lateritic nickel deposit had outlined a saprolite resource of 7.8 Mt, plus an additional limonitic resource of 36 Mt. Antam is continuing with closer grid drillings of 50 x 50 m to upgrade the resource classification.

Copper

Since the end of 1999 when PT Newmont Nusa Tenggara's new Batu Hijau copper mine in southwest Sumbawa came on stream, Indonesia can claim to have two world-class copper mines, the other being the well-known Tembagapura mine of PT Freeport Indonesia in Irian Jaya. The two huge mines produced an aggregate of 3.27 Mt of copper concentrate in 2000, with contained copper metal amounting to over 1 Mt.

The copper-gold-silver Grasberg open-pit which, since its commissioning about a decade ago, became PT Freeport Indonesia's main producing copper (and gold) mine, contributed over 90% of 223,000 t/d mill throughput in 2000. This compares with 220,700 t/d for 1999. Together with production from the earlier opened IOZ and the newly opened DOZ underground mines, Freeport initially planned to increase ore throughput to 300,000 t/d, but huge overburden and tailing disposals into the Aikwa river had prompted outcries and loud protests from the local community, particularly from environmental groups, who voiced their grievances through the mass media.

Exacerbated by an overburden stockpile slippage at the Wanagon basin, which had cost the lives of some local workers early in the year, PT Freeport Indonesia voluntarily agreed to limit production at the Grasberg mine. In December 2000, the government approved resumption of normal mining operations at Grasberg, including the placement of overburden on the Wanagon stockpile.

PT Freeport Indonesia's production in 2000 amounted to 2,522,670 t of concentrate containing 776,048 t of copper metal, a little up on the previous year, but output of associated gold and silver decreased by 16.6% and 3.4% respectively to 77.12 t and 136,931 t. Net production costs of copper, after gold and silver credits, were US$0.23/lb.

Precious metals output was lower than the previous year due to mining of lower ore-grades, although this was partially offset by higher recovery at the mill. Initial production at the DOZ underground mine, which commenced in September 2000, averaged 2,700 t/d of ore during the December quarter. It is expected to produce 14,000 t/y by the end of 2001 and 25,000 t/y by 2004.

At year-end, proved and probable recoverable reserves stood at 2.51 Bt of ore averaging 1.10% Cu, 1.04 g/t Au and 3.4 g/t Ag.

PT Smelting Co., the newly built copper smelter in Gresik, east Java (owned 25% by PT Freeport Indonesia and 75% by Mitsubishi), continued its run-up to full design capacity in 2000. During 2000 the smelter produced 173,800 t of copper, a 37% increase over 1999. All the concentrate feed came from Freeport's operations at Tembagapura.

The fast-developing Batu Hijau mine in Sumbawa completed its first, full production year with a production of 743,697 t of copper concentrate containing 236,000 t of copper metal, by-product gold amounting to 9.9 t and by-product silver to 37.3 t. Since its discovery in 1990, Batu Hijau has formed Newmont's largest grassroots start-up mining project. It consists of a large open-pit mine at an elevation of 480 m approximately 14.5 km from the port of Benety Bay. The tailings are pumped to a deep-sea trench in the Indian Ocean.

Crushed ore from the mine is transported to a concentrator via conveyor. The resulting copper/gold concentrate is then piped to the port, where it is dried and stockpiled for shipment to smelters around the world. At year-end reserves at Batu Hijau were 9.9 billion lb (4.5 Mt) of copper and 11.7 Moz (363.87 t) of gold, sufficient for a 20-year operation. A drilling programme is under way to assess the deposit's deeper mineralisation.

The average annual production capacity of 272,270 t (600 million lb) of copper will be reached by 2002, with an additional by-product gold of 14.9 t (480,000 oz). The total cash cost per lb copper was US$0.57 after gold credits, much higher than Freeport's similar cost item, (US$0.23 in 2000) because the Tembagapura ore is a much higher grade.

The management expects to reduce Batu Hijau's cash cost to US$0.45/lb copper in 2001, with further reductions in the future.

Gold and Silver

Gold and silver production in 2000, despite several interruptions, such as harassment from local people and intrusions by illegal miners, surprisingly, remained steady. Gold output, including gold from the Tembagapura and Batu Hijau operations was 127.2 t, slightly lower than the previous year's peak of 129 t.

Silver production increased by 7.4% to 314.03 t, owing to additional production of 37.8 t from Batu Hijau, sharp increases from the Pongkor underground mine in west Java (27.65 t) and the PT Indomuro open-pit mine in central Kalimantan (95.9 t) and new production coming from the PT Nusa Halmahera mine (4.7 t) at Halmahera.

One gold and silver mine, Barisan Tropical, in south Sumatra, ceased production after three years of operation due to exhaustion of reserves. Freeport's Tembagapura mines produced 77.12 t, a sharp drop of 16.4% from the year before. Batu Hijau contributed 9.95 t.

At PT Indomuro Kencana central Kalimantan, a subsidiary of Aurora Gold Ltd, the operation was invaded by illegal miners who occupied three of the four open pits in June 1999. After a police crackdown on the illegal miners in March 2000, the operation has made a rapid recovery. Production last year rose to 6.2 t (best performance ever) as compared to 5.4 t in 1999. Silver output rose from 84.17 t to 95.9 t. Full credit for this achievement should go to the board of Aurora Gold Ltd, the management and personnel of the Indomuro mine, who remain committed to continue with the operation, for their successful efforts to foster good relations with the local community and authorities, who are now supporting PT Indomuro in warding off illegal miners. The mine has been projected to close by the end of 2002 but exploration is under way to increase the resource.

At the end of December 1998, illegal miners invaded the Pongkor gold and silver underground mine of Antam in west Java. With assistance from the police and by fostering good relations with the local community through a programme of community development, the situation was gradually brought under control. By the end of 2000, the number of illegal miners had reduced to 200, from 1,500 at the beginning of the year, and production of ore rose to 364,000 t, yielding 4.02 t of gold and 27.65 t of silver after processing and refining.

PT Kelian Equatorial Mining's (KEM) ore production in east Kalimantan suffered a 30% decrease in 2000, due to road blockades set up by local people in the June quarter of the year. They were seeking higher land compensation from the company. This conflict was eventually solved with assistance from the local government. Production of gold amounted to 10.516 t a 24% decrease from 1999, but silver production at 10.145 t declined by 5.7% from the previous year production level of 10.730 t.

KEM is 90% owned by Rio Tinto and 10% by PT Harita Jaya Raya. The operation began in 1992 and is due for closure in 2004 because of exhaustion of reserves.

The Gosowong gold and silver mine of PT Nusa Halmahera Minerals, a joint-venture company between Antam (17.5%) and Newcrest Singapore Holding Pty (82.5%) on the Island of Halmahera had its first, full production year since it started operation in July 1999. Despite some interruptions to work due to the religious conflicts raging in north Moluccas, Gosowong managed to boost production of gold to 7.8 t and produced an additional 4.69 t of silver. However, mine-life is estimated at only five years.

PT Newmont Minahasa Raya's mine at Minahasa, north Sulawesi consists of a refractory ore treatment plant and a small heap-leaching operation. The mine produced a record 11.39 t (364,300 oz) of gold in 2000, at a cash-cost of US$133/oz. Newmont Minahasa Raya accomplished this feat despite several forced closures during the year resulting from demands for additional land compensation by a few local people and a strike by a mining contractor. In addition, there was a dispute with the local government (regency) which sought to tax overburden. Through the mediation of the central government the dispute was finally settled out of court. Mining will be completed in December 2001, with lower-grade feedstock processed over the remainder of the project. Closure is anticipated in late 2003.

Most of the Indonesian gold mines, have a relatively short lifetime of five to eight years. Except for some limited gold and base metal exploration conducted by Antam and its joint-venture partners, large-scale mineral exploration campaigns by multinational companies have been drastically reduced or halted in recent years because of political instability, unsatisfactory mining regulations and security problems. It is therefore anticipated that, by 2005, production of gold and silver will decline noticeably.

Unless large-scale exploration resumes, it is likely that production of precious metals after 2005 will derive mainly from the two copper mines in the form of by-products, from Antam's Pongkor mine and a few other small gold mines. However, even in the worst case, the massive contribution from Freeport's Grasberg mine, will ensure that Indonesia's output of both gold and silver will still be substantial.

Tin

The majority of tin mining in Indonesia is carried out by two companies. PT Tambang Timah Tbk is the largest tin-producing company in the world (65% owned by the Indonesian Government and 35% by the public). Its operations extend over the major part of Bangka Island, including its off-shore areas, Belitung Island and offshore areas, and the offshore areas of Kundur Island in Riau province.

PT Koba Tin is a joint venture between PT Tambang Timah (25%) and Iluka Mining Corp (75%), with a more limited working area in the southern part of Bangka Island ie the Koba tin area, which now has been reduced to 41,680ha.

PT Koba Tin, which has been in production since 1973 under a second-generation CoW signed in 1971, is facing expiry of its contract life in 2003. To extend its operational life, the company has renewed its CoW arrangement with the government by signing a seventh-generation CoW in early September 2000.

Tambang Timah Tbk operated 21 dredges in 2000, one less than the previous year, 16 of them operating around Bangka and Belitung islands with five of its larger dredges working around Kundur Island. These offshore dredges produced 17,751 t of tin (in concentrate), while the land mines with a total of 241 gravel pump units (45 units less than in 1999) produced 22,300 t of tin. In total, PT Tambang Timah produced 40,051 t of tin in-concentrate, 8% more than in 1999.

The concentrates were smelted at the Mentok smelter, which has seven reverberatory furnaces (a capacity of 50,000 t/y of concentrate feed) producing 35,550 t/y of metallic tin.

PT Koba Tin operates two land dredges and three gravel-pump mining units (reduced from a total of 5 units in 1999) in its working area. Due to terrain difficulties encountered by one of the dredges, namely the 24 ft^3 Merapin dredge, combined with the reduction of the gravel-pump units, production amounted to 9,395 t of tin, down 13.7% from the previous year. Thus total production of tin in-concentrate by the two companies amounted to 49,446 t a 34% increase on that of 1999.

PT Koba Tin has its own smelter consisting of two reverberatory furnaces (capacity of 9,000 t/y), which produced 10,906 t of tin metal. Altogether PT Tambang Timah and PT Koba Tin produced 46,456 t of tin metal in 2000.

Since most of the tin was exported both companies managed to make profits, helped by the depreciation of the rupiah. PT Timah announced a net profit for 2000 amounting to Rp329.8 billion.

Bauxite and Iron Sand

Bauxite production from the island of Bintan, Riau Province, by a unit of Antam, reached 1.15 Mt in 2000, a 3% improvement on the previous year's figure of 1.11 Mt.

Production came mainly from the Wacopek mine where reserves are practically exhausted. Mining operations are moving to the Lomesa deposit, which contains reserves of at least 2 Mt of high-grade bauxite ore. This will extend the mining operations at Bintan Island for another three years. Most of the mining operation is done by PT Minera Cipta Guna, a contracting company owned by Antam and its pension fund foundation.

Indonesian Production ('000 t except where stated)

	1998	1999	2000
Petroleum and cond. (Mbbl)	568.8	545.7	494
Natural Gas (billion ft^3)	2.98	2.78	2.98
LNG (Mt)	27.2	29.8	27.32
LPG	2,331	2,271	2,087
Tin (in-concentrate)	54.0	47.8	49.4
Tin metal	53.4	49.1	46.4
Coal	60,990	73,780	76,465
Bauxite	1,006	1,116	1,151
Iron sand	561	562	489
Nickel ore	3,233	3,235	3,039
Ferro-nickel (contained Ni)	8.5	9.2	10.1
Nickel-matte (contained Ni)	35.6	45.4	59.2
Copper concentrate	2,640	2,645	3,270
Cu in-concentrate	809.1	766.1	1,012
Cu metal		126.7	173.8
Gold (kg)	124,010	129,030	127,192
Silver (kg)	348,970	292,330	314,032
Granite	4,801	4,106	n.a.

n.a.: Not available

For the past few years Antam has been carrying out exploration of the bauxite deposit at Tayan, west Kalimantan. During 2000, systematic test pitting on a spacing of 100 x 100 m was conducted and 765 m of drilling were completed. Total bauxite reserves at Tayan as of December 2000, amounted to 91 Mt. This deposit has been earmarked to provide development feed for Antam's proposed US$150 million chemical grade alumina refinery project. The Ministry of Mines and Energy has given preliminary approval for the project that includes two international partners.

Another potential bauxite prospect at Kandawangan, located in the southwest part of west Kalimantan was explored by Antam using test pitting on systematic grids of 100 x 100 m, aimed to prove alumina grade resources using a cut-off grade of 47% Al_2O_3. By the end of 2000, bauxite resources at Kandawangan were estimated at 42 Mt. Unlike Tayan, Kandawangan is located close to the sea.

Iron sand (concentrate) is produced at the southern coastal areas of Java, namely Cilacap and Kutoardjo in central Java and Lumajang in east Java. Production in 2000 was 489,126 t down 9% from 1999, largely as a result of flooding at the Cilacap mine in November 2000.