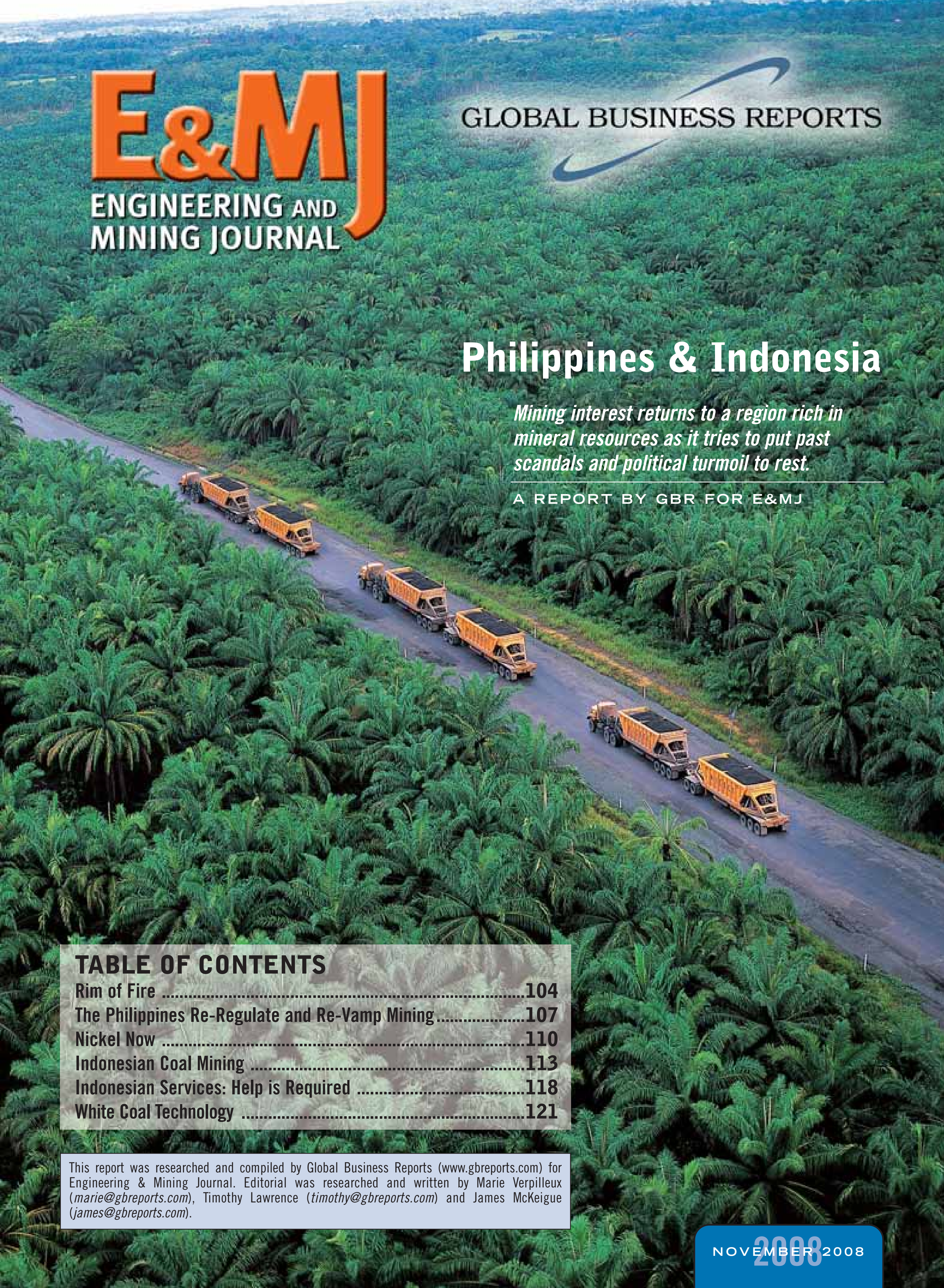

E&MJ
ENGINEERING AND MINING JOURNAL

GLOBAL BUSINESS REPORTS

Philippines & Indonesia

Mining interest returns to a region rich in mineral resources as it tries to put past scandals and political turmoil to rest.

A REPORT BY GBR FOR E&MJ

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NOVEMBER 2008

Rim of Fire

Mining in the Philippines and Indonesia

Operation in Penambangan - PT Bukit Asam.

The Philippines and Indonesia together are made up of a total of nearly 25,000 islands. Located on the Pacific Rim of Fire, both countries have very high mineral potential. Move away from the rapidly urbanizing capital cities and underneath the ground, gold, copper, platinum, zinc, iron ore, tin, nickel, lead and coal (thermal and coking) can be found in the region.

Despite acknowledged potential, neither country has returned to the halcyon days of the late twentieth century when the Philippines was in the top 10 gold producers worldwide and Indonesia could be found in the top four. What has happened to cause this drop off in production and can previous positions be re-attained?

The new millennium saw both countries suffering from the after effects of the Asian Financial crisis, a fall in commodity prices and the Bre-X scandal. Their combined effects seriously affected the mining industry, particularly exploration, in both countries. Junior exploration companies from Canada, Australia, the U.S., and Great Britain, with a few notable exceptions, simply cut their losses and ran. Slowly these juniors are returning to Indonesia and at a faster rate to the Philippines.

Financial turbulence and scandal do not account for the whole story. Both countries have experienced significant political change. The Philippines seems to have left the Marcos era behind, although allegations of corruption and vote-rigging are never far from the surface. Indonesia, on the other hand, is still working out what the end of the Suharto era, de-centralization and reformation really mean, and if the regional authorities are capable of dealing with their new-found powers. Particularly in Indonesia, companies that are used to dealing with Central authorities are now forced to find ways of working with a multitude of new layers of regional officials.

The Philippines, under the Arroyo government, appears more stable. The 1995 Mining Law has bought about significant changes, allowing for 100% foreign investment under a Financial or Technical Assistance Agreement (FTAA), as well as introducing Mineral Production Sharing Agreements (MPSA) for partnerships between Philippine and foreign companies. A comprehensive system of environmental, community and indigenous people permits and regulations are in place, though not quite as comprehensive as some would like. The Arroyo government has been vocal in its support for sustainable mining.

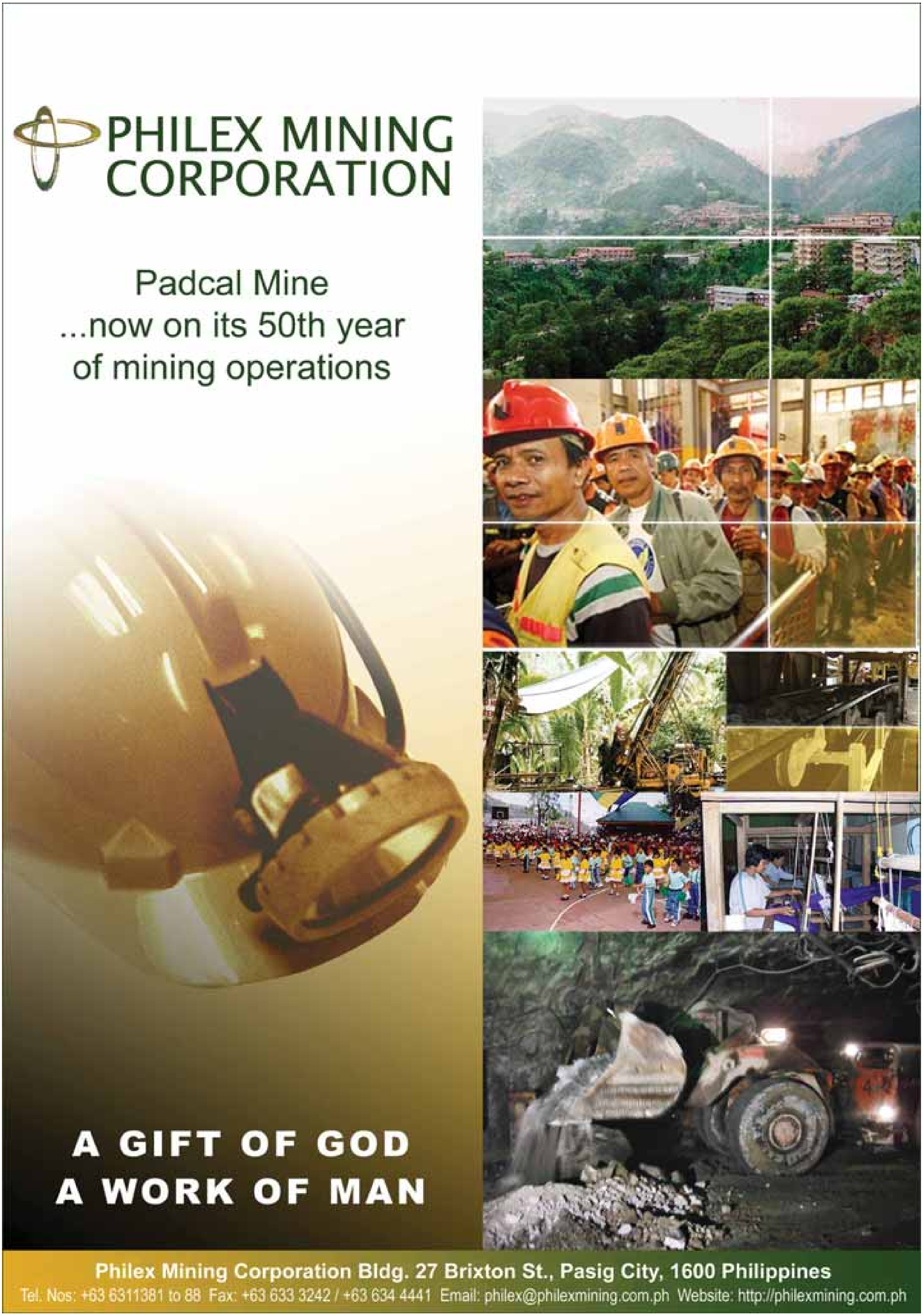
The Department of Environmental and Natural Resources (DENR) and Philippine Chamber of Mines have suggested figures of up to $11 billion will be invested in mining over the next four years. This investment will take place as part of a revitalization program of 23 formerly mined sites, and also includes investment on new large projects such as the Indophil-Xstrata Tampakan copper project, and the Philex Boyongan gold-copper project.

The real nature of this support, however, has to be called into question when OceanaGold's Didipio project ran into trouble with the local government over non payment of locals taxes for its use of aggregates on the mine site when central government support was not forthcoming. Nevertheless, there are many projects coming online, yet the numbers bandied around at mining fairs across the world by the Philippine Chamber of Mines seem optimistic when compared to what is happening on and under the ground. The movement for positive mining industry development is not assisted by the constant changes at the head of the DENR: current incumbent Sec. Jose L. Atienza is the 6th head of the DENR in six years.

Miners in the Philippines have had a long struggle to make their voice heard against the powerful anti-mining lobby consisting of NGOs and the Church. These organizations point to the Marcopper and Rapu-Rapu incidents which involved toxic spills from tailings dams and the impact that mining has on the environment through de-forestation. DENR Secretary, Jose L. Atienza, outlined their position: "Objections to mining come from the traumas of the past. The first mining cycle saw significant environmental problems due to a lack of appropriate legislation. We must learn from Marcopper and Rapu Rapu to avoid repetition of the same."

Despite these problems, mining is slowly increasing its contribution to the Philippine GDP, from 0.7% in 2003 to 1.2% in 2007. As a contribution to exports a similar story can be seen, from 1.8% in 2003 to 5.2% in 2007. These figures, although progressing in the right direction, do not reach the 6% necessary to make the Philippines a World Bank recognized mining country.

Jose L. Atienza, Secretary of the Department of Environment and Natural Resources.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Indonesia has been less successful and is perceived as being four or five years behind the Philippines concerning its industry related regulations. Indonesia's Contract of Work (CoW) system—under which the major mining companies have fixed agreements with the Indonesian government on taxes and responsibilities—is coming to the end of its life. A new mining law to replace this system is not yet complete. This law has been under discussion for a while and contains many interesting ideas, including increased in-country processing and further transfer of power to the regions. The 2009 elections are likely to delay any ratification until 2010.

Currently, the devolvement of power to the regions and Bupatis (local mayors) has led to uncertainty over who issues permits. Combined with restrictions on operations in protected forest areas under Law 41 of 1999 there have been few chances to develop new operations.

Nevertheless, companies such as Freeport, Newmont and Newcrest continue to show their faith in Indonesia. Freeport has been operating in Indonesia since the late 1960s. Their Grasberg open-pit and underground mine has a capacity of 300,000 metric tons per day (mt/d) and had consolidated sales of 1.2 billion lb of copper and 1.7 million oz of gold in 2006. Grasberg Indonesian assets account for 40% of the company's worldwide copper reserves.

Newmont has been operational, in less hostile conditions than Freeport, since 1986. The Batu Hijau mine started commercial production in 2000 and the mine on West Nusa Tengarra accounted for 28% of the companies 2007 revenues. In May 2007, the CoW conditions meant that Newmont's holding in the operation decreased from 52.875% to 45%.

Newcrest has been successfully mining very high grade gold in Indonesia, with joint venture partner, state mining firm ANTAM. Newcrest suffered the disadvantage of being in a protected forest area. A.B. Syahrir, Government and Community Relations manager of Nusa Halmahera Minerals, outlined how the problem could be overcome: "When we first entered the area mining was not permitted and between 2000-2001 we had to stop operations. In May 2003, we said that we would move to another country, the government responded positively to this, issuing a dispensation letter allowing NHM to enter the protected forest."

There has been an increase in exploration over the last two years as is testified for by Intertek labs who have seen the number of samples being sent to them increase dramatically over the last 18 months. This upsurge is in spite of the uncertainty over the new mining law—investors are trying to get in while the CoW system is still operational.

Not Just Precious Metals

Although precious metals discoveries are the headline grabbers, it is in other areas that growth has occurred in both the Philippines and Indonesia. Philippines mining revenues increased dramatically due to Chinese demand for Philippine nickel. In 2004, there were four nickel mines exporting. By first quarter 2008 there were 10 larger mines and various others involved in smaller scale direct shipping. The new Coral Bay Nickel Corp. HPAL nickel refining plant on the island of Palawan is a step toward adding value to nickel mined in the Philippines, something the government is encouraging.

Meanwhile in Indonesia there has been a boom in coal production. Indonesian coal is primarily steam coal from low-cost, open-cast mining operations. Thai and Indian companies, including Banpu, have joined the local players like Bumi Resources and foreign interest continues to increase. Many of these companies are holding companies that contract out all of the work involved, while owner operators like BHP are rare. This characteristic opens up many possibilities for the service companies.

In 2006, 210 million mt were produced, up from 140 million mt in 2005. All but 41 million mt were exported. The government's projected plan to develop coal-fired power plants should see domestic demand increase, although not at the expense of the export markets.

Indonesian coal is low grade, which makes it the ideal market for clean coal technologies such as the White Coal technology being used by Kideco Jaya Agung and Bayan Resources. In the future, when higher-grade coal on central Kalimantan is developed, the country will be able to move into blending coal to meet the specific demands of the international market.

Both the Philippines and Indonesia have the potential, the reserves, the expertise, the operational mines and past success stories that indicate a profitable future. All that remains is for the legal uncertainties to be ironed out in order that the exploration potential to be realized.

The Philippines Re-Regulate and Re-Vamp Mining

Mining in the Philippines has seen significant changes in the last four years since the long-awaited ratification, in 2004, of the 1995 Mining Act. The delay was caused by a dispute with various nongovernmental organizations (NGOs) over foreign ownership of mining rights in the Philippines. The law now allows for 100% foreign ownership, under Financial or Technical Assistance Agreements (FTAA) on projects valued at more than $50 million.

The time taken for the Supreme Court to ratify this law was a key factor accounting for the lack of investment between 1995 and 2004, though low commodity prices did not help either. This short fall has left ample space for investment today.

The Chamber of Mines, headed by Philip Romualdez, played a key role in forcing government to ratify the act and has since been actively promoting mining at road shows and fairs across the world. These efforts have been rewarded by an upsurge in the number of mining companies coming to invest. Sec. Atienza aims to attract $11 billion in mining investment over the next four or five years.

To tempt investors, the Philippines can offer gold, copper, zinc and silver with the real success story of the last two years coming in nickel. Such is this potential that many major global miners are becoming involved.

Yet for all of the potential underground, there remain challenges to be faced when operating in the country. The OceanaGold project at Didipio, one of the first to try to become operational under an FTAA, is currently on hold following a dispute with the Local Government Unit (LGU) in the region over non-payment of taxes for using aggregates.

The discrepancy between the support that the Arroyo government shows toward mining and the hostility of the local communities is also worrying. There needs to be successful examples of mines in operation that can help demonstrate the positive changes that mining can bring to a community to overcome a latent local prejudice, the result of bad stories from the past, notably the 1996 Marcopper and late 2005 Rapu Rapu incidents, when tailings dam spills polluted the seas around the mine sites.

Celebrations at the launch of the Adopt a School program, co-sponsored by Mindoro.

The increased interest in Philippine mining has been reflected on the Philippines Stock Exchange. The mining component of the exchange has seen an increase in trading above that experienced by the rest of the exchange, and witnessed its first IPO since the Mining Act this year by Oriental Resources.

The exchange is also taking steps to attract foreign companies, by introducing a code based on the JORC (The Australasian Code for Reporting of Exploration Results). The Philippines Mineral Reporting Code is a joint initiative of the exchange and the Chamber of Mines. The code will make it easier for exploration companies, who don't have the income generator of a producing mine, to list and raise capital in the country.

Many of the local mining companies that are listed on the Philippine stock exchange have yet to recover from the downturn and reach previous levels of production. Philex is a local producer who successfully survived the commodities downturn. The company's Padcal mine in the Benguet region is successfully mining copper using the block caving technique—the first company to introduce this technique to the region. Dr Walter Brown, Philex's chairman said: "The Padcal mine is the first underground block cave operation in the Far East and has produced 1.96 billion lb of copper, 5.14 million oz of gold and 5.66 million oz of silver. It is currently mining at 25,000 metric tons per day (mt/d) ore with grades of 0.26% copper and 0.62% g/mt gold." These low grades mean that the Philex operation has to be highly efficient and cost effective.

The Padcal operation isn't the only asset that Philex has. Previously working with Anglo American in a joint venture (JV), Philex is looking to buy out the senior mining group and develop the Boyongan copper-gold project independently. The project has an estimated reserve of 300 million mt at 0.6% copper and 1 g/mt of gold. This project should be in production stage by 2012.

Lepanto is another major Philippine mining company which should return to profitability this year—assuming global conditions don't deteriorate much further. This return to profitability will result from the reopening of the Enargite copper prospect.

Lepanto is developing other projects with Chinese and European JV partners.

Dr. Walter Brown, chairman of Philex.

The Far South East project, one of the governments key revitalization projects, should have 163 million mt of copper at 0.81% and 1.76 g/mt gold. To develop this project, Lepanto will require investment of around $450 million.

The ratification of the 1995 Philippine Mining Law has created real opportunities for many foreign companies. Some of these, such as Cadan Resources, have been in the country since 1996 and are well positioned for the upturn. Operating on Mindanao, with the associated security challenges, Cadan are looking for a copper porphyry of a scale similar to Tampakan. Cadan's size means they require a heap leach operation to generate some cashflow to continue developments.

Operating on Mindanao is a challenge that TVI Pacific is tackling head on. Their Canatuan project on the island has bought them into contact with local community issues and is providing test cases for the Indigenous Peoples framework that the government has put in place. Despite the operational challenges of both the local communities and illegal mining, TVI is continuing to develop their operations and will soon be moving into the production stage of their Canatuan sulphide project.

It isn't just TVI who is wrestling with the problem of small-scale mining. The government has also become involved with the creation of the Philippine Mineral Development Corp. (PMDC). Formerly the Natural Resources and Mining Development Corp., this organization has separated the auctioning of areas from the permitting process controlled by the MGB.

The main PMDC project is the Diwalwal area. This high-grade gold area is very attractive for smaller Philippine operators who are looking to take advantage of currently high gold prices. Oliver Butalid, PMDC chairman, explains the challenges of the area and the reason for the PMDC. "We were formed primarily to address the problem of Diwalwal, a highly mineralized gold area. The government hadn't been present in the area for 20 years, and small-scale and illegal miners were dominating." The PMDC, under the guidance of Butalid, is attempting to build on their success in auctioning off nickel areas and develop the gold areas in the same way.

The artisanal or small-scale mining issue is one that has prompted innovative thinking from Canadian-based Mindoro Resources Ltd. Working on the Kay Tanda gold project, Mindoro has reached a voluntary agreement with the tribal elders on the land. While agreements like these are expedient and get things moving, in the longer term there needs to be more consultation and a countrywide policy on how relationships with local communities should be undertaken. This is important both for the indigenous people and also the LGUs. The Philippine mining association, although aware of the problems, needs to start taking some real steps to attempt and sort them out.

Not all of the country has grades as high as Diwalwal, making illegal mining less prevalent elsewhere. To access lower grades, proper investment is required.

As well as the Didipio copper-gold project, another flagship project is the Filminera Resources Masbate gold project. A previously mined site, there remains useful infrastructure in place, including a port and airstrip, which will reduce start up costs for the company. Taking the form of a Mineral Production Sharing Agreement (MPSA), part of the value of getting a project like this functioning will be to show other companies that it is possible despite opposition from NGOs and LGUs.

Metals Exploration, a Philippine-based company listed on the London AIM, is using an MPSA to get operational at Runruno. They have recently announced a JORC compliant resource of 2 million oz of gold and 34.4 million lb of molybdenum. Despite the possibility of developing the project under an FTAA, Metals Exploration has chosen to work under an MPSA to avoid accusations of taking all the money out of the country. With another two exploration permits and five exploration permits awaiting approval, the company is looking to build on the toehold it has established in the Philippine market.

The increase in exploration and development activities has had an impact on the drilling companies. New Philippine companies are joining the ranks of international players such as UPD. UPD Chairman, Alan Blackley, explained the importance of working for the international players. "These groups are the ones who reach the necessary international safety standards," Blackley said. "We provide a quality service and we also operate our business within strict SHE guidelines, which meets the requirements of the senior mining companies. If you don't deliver you won't be asked back."

It isn't just drilling companies who are bringing international safety standards to the Philippines. "Orica is always abreast of the latest ideas and training. There is a management team of safety and security who travel the world advising. We take health and safety ahead of speed of production, you can't be a cowboy in the explosives game." said Ian Winter, Orica Country Manager. These standards ensure that new technologies like IKON, Orica's proprietary blast based service, are correctly implemented, as at Philex's Padcal mine.

The diverse geography of the Philippines holds its own challenges for companies like UPD. Despite being close to the coast, the inhospitable terrain and environmental regulations mean that accessing drilling sites can be tricky.

Getting samples from these exploration sites to a central laboratory is a challenge that Ostrea mineral laboratories has taken in hand by offering a mine site service. This testing service means that the laboratory can turn samples round in under two weeks. Ostrea is also leveraging on its scientific background to develop a new technology for extracting Gold from Ore. The risk adverse attitude of many Philippine investors means that Ostrea is looking overseas for the financial backing.

The combination of coastal locations and occasional typhoons like Typhoon Frank, which sank the MV Princess of Stars, make open-pit mining and building tailings dams a real challenge. GHD Engineering, which has been in the Philippines for 80 years, has built up a wealth of knowledge in water control and dams areas. The company successfully met the challenge earlier this year. "One of the first things we did after typhoon Frank was check how our tailings dams had stood up," said Fraser Watt, general manager, GHD Philippines. "They are planned to cope with weather like this. If we do our job right we get complete containment and nothing failed under the storm."

Creating mine plans and developing tailings ponds is worthless without having staff to operate the plants. The downturn in the Philippines saw many of the mining schools shut down and the industry is struggling to develop the necessary geologists and mining engineers.

Leighton Engineers is involved in the creation of programs to reach out into schools to attract students to the industry. If something isn't done soon then new projects will be hampered by a lack of qualified individuals at all levels of operations. "From 200 licensed mining engineers graduating a year in the late 1980s, this figure has dropped to a single digit number," said Phil Naughton, country manager of Leighton. "Working with the Philippine Society of Mechanical Engineers we have started to sponsor second year engineers to encourage them to specialize in mining."

There are still many issues to be overcome, and some of these, such as defining the separation of responsibilities between local and central government, need guidance from the DENR and MGB. Concerted action to regulate or stamp out small-scale illegal miners needs strong central leadership so that companies don't become bogged down in local disputes.

If the government's aim of reaching $11 billion of investment is to be achieved, then some of the larger investment projects such as Philex's Boyongan and Xstrata's Tampakan need to be developed and seen to succeed. The importance of OceanaGold and Masbate leading the way, getting their projects running and showing investors that the Philippines has really moved on since the late 1990s early 2000s doldrums cannot be over-estimated.

Nickel Now

What oil is to the Middle East and copper is to Chile, nickel could be for the Philippines. The late 2006-2007 increase in Chinese demand, coupled with continued Japanese and Australian requirements has made nickel a key component of the Philippine mining revival. In 2006, nickel exports saw a 1,288% increase. 2007 saw a drop from this all time high, and the softening in Chinese demand means nickel will account for a little less in 2008. Yet the metal remains a key element for many Philippine mining companies.

The number of nickel mines has increased from four in 2005 to 11 in 2007 in a scramble to catch the wave. Some companies, such as SRmetals, are using earth moving technologies from their construction business such is their impatience. Nickel mining is also being undertaken by foreign companies, many of them with local partners, although links between the disparate organizations are sometimes challenging.

Despite the success, there are anomalies to the nickel story. In 2007, the Chinese recorded more Nickel imports from the Philippines than the Philippines recorded as exports. The direct shipping of Nickel Laterite means all you need is a boat and a bulldozer. Illegal mining using small scale mining permits for work that should be undertaken under an MPSA is prevalent and affecting the reputation of the responsible operators in the country.

The DENR, under the guidance of Atienza, the sixth secretary in as many years, has taken steps to stop this illegal mining and shipping of ore. In February 2008, ships laden with 400,000 metric tons (mt) of nickel ore were prevented from leaving port in Zambales.

Direct shipping operations are only the first part of the Philippines nickel story. In 2004, the Coral Bay Nickel Corp. HPAL constructed a nickel processing plant, using Sumitomo technology. A first step in a trend toward more value-added products from the Philippines. The move to processing will become increasingly important as demand from China for low grade nickel laterire falls.

The oldest nickel miner in the country is Rio Tuba. Incorporated in 1969, mining commenced in 1975. Since then, Rio Tuba, part of the Zamora group of companies, has developed a strong relationship with the Japanese market which has proved beneficial later in its history. The length of time mining here and the high grades being exported to Japan left a stockpile of low grade material ideally suited for processing.

It is the low cost and direct shipping potential of nickel laterite that has attracted local mining companies to the material. The success of SRmetals encouraged other companies to join them.

Carrascal Nickel Corp. (CNC) is one of the newest players on the scene. “Carrascal Nickel is a relatively new mine, the company just started mining operations late 2007 with the support of Fujian Wu hang, the largest private stainless steel producer in China,” said Antonio L. Co, president, CNC. Although new, they are targeting exports of 2 million mt of low- to medium-grade nickel ore to China this year. Aware of their relative youth in the field, Carrascal is attempting to be a pioneer company, investing in x-ray analysis technology to get fast and accurate information on their ore.

While focused on short term exploitation of nickel, Co said, “for the long-term program, we would like to consider working on copper, gold and silver mining claims. We can easily assemble a team of technical people to handle these operations.” The team they have of engineers and geologists with experience of working in the country’s established mining companies backs this claim up.

There are many international companies showing an interest in the Philippine nickel market. Berong Nickel Corp., in which Toledo Mining has a 56.1% interest, is another nickel success story. Run by TMM Management, who are also responsible for the Celestial project, Berong owns a 354-million-mt resource suitable for direct shipping operations.

The speed with which Berong became operational shows that it is possible to process all the necessary permits here swiftly. “People say that permitting is difficult, but Berong went from starting to drill, through evaluation and feasibility in a year, which required a lot of work but shows it is possible,” said George Bujtor, CEO, Berong Nickel. Despite improvements in the permitting procedures, the mines and geosciences bureau continues to be understaffed and companies have to be really attentive to keep their developments on track as they move through the system.

Other companies mine for themselves, such as the Australian firm Rusina. Their Acoje project has a resource of 33.15 million mt at 0.95% nickel. Working with local real estate and construction firm DMCI, Rusina hopes to use these direct shipping operations as a springboard to other operations. "Direct shipping isn't a long-term option, but it provides a cash-flow lifeline," said Robert Gregory, CEO and managing director, Rusina. "The future is in adding value to our nickel product. This is an advantage of nickel over other operations. It is the first stage, which can be expanded and developed. This staged approach can be done with nickel but it's difficult with other projects." Rusina brings the mining experience and DMCI has the understanding of how the Philippine commercial environment works and can leverage on their construction capacity to build ports and the necessary infrastructure.

Rusina, although currently concentrating on nickel operations, also has platinum and copper potential, the platinum has been explored through

Robert Gregory, CEO of Rusina.

2008 and the copper, which can be found in the center of Xstrata's Tampakan property, is awaiting further decisions.

Nickel laterite is also attracting interest from Canadian based companies. MRL Gold, on their Agata property, have 7 million mt of measured and inferred nickel laterite at 1.25% nickel. Direct shipping is one option, but Tony Climie, COO, explained that the company also sees the future in value added products. The challenge here is convincing investors that it is worth waiting for a processing plant, which could cost up to $2 billion before seeing a return on their investment. The example of Coral Bay and the impetus from Sumitomo in the area shows that the rewards are worth waiting for.

The focus on Mindanao for Mindoro means that their promising Gold and Copper projects have been put on the backburner. Kay Tanda already has a resource of 360,000 oz, but Mindoro is aiming for 1 million oz. Climie explained how priorities can change. "Right now there is more potential for early production from our nickel laterite project, and there is more market interest in this, but this could change with one drill hole into a new porphyry copper gold prospect," said Climie.

There are many positive stories coming from nickel mining, but not everybody is so lucky. BHP Billiton and its local company, QNI Philippines, reduced operations in the country earlier in the year due to a dispute with local company Asiaticus Management. The Pujada nickel project could bring in up to $1.5 billion of investment, but there is currently a stalemate betweeen the two companies as the courts deal with the case.

Processing Power

Coral Bay Nickel Corp. (CBNC), 54% owned by Sumitomo, is a true success story of the last 10 years. The HPAL plant on Palawan island is using low grade nickel from Rio Tuba's operations. "The [Rio Tuba] stockpile will last for 20 years," said Fuijimura. "The positive results from this operation have led CBNC to expand their operations at Coral Bay, aiming to double their output to 20,000 mt/y.

The friendly investment climate of the Philippines has also made the country a choice for another HPAL plant which will be constructed in Surigao. This is part of the long-term Sumitomo strategy. "Sumitomo would like to open a new HPAL plant in Surigao as part of its strategy reaching 100,000 mt/y, of which 40,000 will be from the Philippines," said Fujimura.

Takanori Fujimura, president, Coral Bay Nickel Corp.

HPAL is one option for processing ore. Another option is in furnaces. Platinum Group Metals Corp., a wholly Philippine company, has acquired smelters and kilns to process their nickel. Earlier this year Sec. Atienza granted a mineral processing permit for the company to start operating its Manticao ferro-nickel plant.

"We started with a small group and now it has become a three smelter company with two existing mines," Rafael Atayde, Platinum Group Metals. "We were able to get the permits, the board of investment tax holidays and as a result the value of the company has increased." Currently both a mining and processing company, the two are to be separated to make it facilitate foreign investment on the processing side.

Although the drop in Chinese demand has led to a fall in direct shipping operations, the companies and government were already aware of the need to move into processing. As Secretary Atienza at the DENR explained " We would like to encourage investment in processing and production here in the Philippines to maximise benefits for the national economy." If this happens, and the interest from companies like Sumitomo and BHP, as well as local operators is sustained, then nickel processing and export could establish the Philippines as a competitor to its close neighbours Indonesia, Australia, Japan and China.

Indonesian Coal Mining

Time for government departments to coalesce

At a glance, coal producers operating in Indonesia would appear to be in an enviable position. While coal mining worldwide has been boosted by a consistent gain in coal prices since 2006, Indonesia has special appeal, including: massive coal reserves, a well-established mining culture, a large pool of labor and, perhaps most crucially, proximity to the rapidly expanding Chinese and Indian markets. Yet these strong advantages are mitigated by a number of political factors that threaten to prevent Indonesia from achieving its natural position as a world-class coal center and enjoying the subsequent economic and social benefits. This article examines the opportunities and challenges facing the Indonesian coal mining industry and how the coal producers, government and wider Indonesian society are working to overcome them.

Overburden stripping at Tutupan - PT Adaro.

Indonesia's mineral and coal wealth is spread over a range of its 17,000 islands, but the most plentiful coal reserves are found in Kalimantan (Indonesian Borneo). The massive island is also home to a diverse ecosystem, boasting a rich array of tropical flora and fauna. The beautiful and important forests that grow above many mineral deposits create an obvious hurdle for coal producers as some government officials, environmental non-governmental organizations (NGOs) and local communities believe that mining will damage the island's ecosystem. While it is commonplace for coal producers to have to work with interested parties to resolve environmental issues, in Indonesia the problem is exacerbated by the country's political culture.

It is only 10 years since the country emerged from the dictatorship of General Suharto and the new democratic legislative and executive institutions are still establishing the extent of their roles and their power. One of the first major laws passed in the post-Suharto era was Forestry Law 41 in 1999. This law created categories of forest and determined what economic activities

Indonesia relies on a healthy coal export market.

could take place in which, with the central aim of ensuring forests were not irrevocably damaged or changed. This law has had a profound effect on mining because while mining permits are issued by the Department of Mines and Energy, any concession that contains forest requires a 'borrow to use' permit from the Department of Forestry.

This issue is particularly pertinent for the coal industry because a subclause of Article 38 of Law 41 prohibits open-cast mining in areas designated as protected forest.

"The soft terrain that is found in Kalimantan means that enclosed or underground mining is impossible," said Priyo P Soemarno, chief secretary of the Indonesian Mining Association. "Moreover when mining a resource the primary question is about what is geologically feasible, not what is politically suitable."

The situation is confused by Article 19 which gives coal producers the opportunity to alter the status of a forest, thereby making opencast mining possible. Of the 22 companies that applied for mining licenses since the adoption of Law 41, 13 have concessions located in areas of protected forests. These companies are still awaiting a verdict from the Department of Forestry. The uncertainty caused by law 41 has led to less companies applying for mining permits.

In addition to the coal mining industry's view that Law 41 was poorly drafted and haphazardly implemented, there have also been claims that the Department of Forestry is biased against mining. These claims were substantiated in 2006 when the Department of Forestry created a regulation (Forestry

Ministerial Regulation no.P.14/Menhut-II/2006: Article 12, sub-article 4) that exempted loggers from paying the same indemnity for using a natural forest for commercial purposes that miners currently pay.

It would take a much longer article than this to objectively examine the positions of both parties, but what is clear is that the intergovernmental dispute sends a worrying signal to international coal miners considering projects in Indonesia. A PriceWaterhouse-Coopers report published at the end of 2007 found that Indonesian miners see the conflict between mining and forestry interests as the second most serious obstacle to operations in Indonesia—superseded only by the legal uncertainty concerning the new Minerals and Coal Law.

Another post-Suharto political trend to affect the coal mining industry has been the move to a decentralized government system with regional authorities being given a host of new powers. Formally Contracts of Work (CoWs) were issued by central government, but now mining rights (Kuasa Pertambangan or

Loading offshore by floating crane - PT Adaro.

KPs) for areas under 5,000 hectares are awarded by the Bupati (local mayor). The system has caused some problems as each Bupati operates under a different system, while there have been complaints of corruption and incompetence.

Another consequence of the change is that as these permits are often easier to obtain than a larger centrally issued concession, there has been an increase in the number of smaller coal mining operations.

Many of the new coal projects have been funded by Indian or Chinese groups eager to secure quick supplies of coal for direct shipping to feed the rampant demand in their home countries. India's program to boost its power supply with a host of new coal-fired power stations has created a particularly high demand for steam coal.

One possible disadvantage of this trend toward a myriad of smaller operations is that smaller firms often provide less benefits in terms of sustainable mining practices, corporate social responsibility and taxation.

"In the current environment there is an increase in small opportunistic miners who do not benefit the industry in the same ways that the larger players can," said Kideco Jaya Agung's President Director, Kim Suung Kook.

Kideco Jaya Agung is Indonesia's third largest coal producer with a projected production of 22 million mt in 2008 and estimated mineable reserves of 570 million mt. The company provides direct employment for 6,000 people, operates a training scheme and sponsors scholarships with universities; important social benefits for Indonesia that rarely accrue from smaller, direct-shipping operations.

Aside from the socio-economic benefits of larger projects, they also provide more reliable, long-term coal production."Trying to build an international standard project out of a small KP that is limited to 5,000 hectares is impossible. The small size of the concession prevents companies achieving economies of scale on exploration costs and subsequently stops them from finding and developing world class ore bodies," said Brett Dennis Gunter, president director of mine consultancy firm GMT Indonesia.

The need for the sophisticated development of world-class ore bodies in Indonesia is even greater in the wake of the government's ambitious plan to build a network of new coal-fired steam power plants with a total output of 10 gigaWatts by 2010. Although analysts estimate that Indonesia, currently the world's second biggest coal exporter, with estimated reserves of 5 billion mt, will have little difficulty in supplying the required additional 50 million mt/y, it is clear that new reserves will have to be found as increasing production shortens the life of the existing mines.

In short, investors and coal producers may feel optimistic about the future of Indonesian coal mining.

It is the demand stemming from this scheme and similar ones in neighboring countries that encourages optimism in Indonesian coal mining, despite the regulatory difficulties. The government made an encouraging step by forming the Harmonization Committee, whose aim is to help the Department of Forestry and Department of Mines and Energy reach a consensus. Meanwhile the coal mining association is rallying its members and attempting to make the government aware of the important benefits that a well regulated mining industry can bring to the whole country.

There has also been exciting moves to create a fledgling coal bed methane (CBM) industry. CBM is well established in China and the U.S. and, with estimated reserves of 450 trillion cu ft, there is no reason why it could not become a profitable source of energy for Indonesia. International development organization Advance Resources International has been testing the most promising CBM sites in Indonesia to establish a good location for the first CBM plants, while the government hydrocarbon agency, Lemigas, is ascertaining the technical challenges of bringing the CBM industry to Indonesia. The agency has already acknowledged that technology transfer agreements with foreign firms will be needed to foster CBM in Indonesia.

In addition to the work of government agencies and international organizations, private firms are also starting to explore the opportunities of CBM.

Indonesian Coal Exports and Domestic Consumption (in million tons)

Year	2006	2005	2004	2003	2002	2001	2000
Exports	148	113	93	85	73	64	57
Domestic	45	35	37	31	29	27	22
Total	193	148	130	116	102	91	79

Source: Indonesian Coal Mining Association

"ECI coal would definitely consider coal bed methane at some point in the future. In fact we have already begun talks with some international partners regarding a possible project," said ECI Coal President Director, Honardy Boentario. He concedes that ECI Coal may go to the markets within a few years. The president director of the medium-sized coal producer (it currently produces 80,000 mt/month and plans to boost that to 150,000 mt/month within a year) is encouraged by the number of Indonesian coal companies to have launched successful IPOs in recent years. Although the current problems in the international capital markets may affect this trend, the spate of IPOs is a clear indicator of the health and profitability of Indonesian coal mining.

In short, investors and coal producers may feel optimistic about the future of Indonesian coal mining. It is clear that there are some significant regulatory challenges, but encouragingly there appears to be a genuine acceptance in the Indonesian Government that these problems need to be resolved. There is hope that the new Minerals and Coal bill, which was first drafted in early 2000, will be finally ratified in the coming year, while the Harmonization Committee will continue to work to create consensus between the Department of Forestry and Department of Mines and Energy. It is only natural that a fledgling democracy needs time to resolve legal inconsistencies and conflict between government departments. In time, however, the massive economic and social benefits that Indonesia can accrue from the well organized mining of its abundant coal reserves should make progress unstoppable.

Indonesia's efforts to overcome the internal factors that hinder its coal industry could yet be undermined by the fallout from the credit crunch. As the turmoil affecting the financial markets spreads to the 'real economy', demand for energy and steel–and subsequently coal—has slipped, posing more questions for Indonesia's coal producers.

Indonesian Services: Help is Required

The mature nature of the precious metals market and the recent boom in coal production has led to a growth in companies providing services in both sectors. "Over 95% of the coal is contract mined here, compared with 30% in Australia," said Roy Olsen, president, Thiess Contractors. The reliance on contract mining services has created many opportunities for companies in the mining services sector.

The opportunities for services companies start before a deposit has been discovered. Indonesia based drilling companies have seen significant growth as minerals exploration has increased in the last two years. This exploration has included both resource extension and greenfield exploration. The necessary expansion has been undertaken against a backdrop of a worldwide shortage of qualified personnel and available equipment. "Four years ago we [Boart Longyear] had 15 rigs in Indonesia and by the end of the year [2008] we should have more than 60," said Chris Hall, country manager for Boart Longyear.

Filler press dewaters ore.

Drilling conditions in Indonesia can be very challenging and getting rigs into remote jungle and mountain areas is a major hurdle, yet the chance of a new deposit on the scale of Grasberg make the risks worthwhile. The remoteness of new areas means that rigs that can often only be helicoptered in—thereby reducing the environmental footprint of the rig on the ground. As well as challenging conditions the country's size and lack of infrastructure means that rig transportation times are longer than in many other countries, getting from sites in North Sumatra to Irian Jaya can take three days.

The increase in exploration is evident in the amount of samples received by Intertek labs. 2007 and 2008 saw huge increases on those received in 2006, from 350,000 in 2006 to 520,000 in both 2007 and 2008 (assuming samples continue arriving in the current financial climate).

Intertek has been in Indonesia for a long time. "We are the largest commercial analytical group in South East Asia and we dominate the Indonesian market. We survived the down turn and are well placed for the future," said Stephen Southern, general manager, Intertek Labs. Intertek has its main operations in Indonesia, and labs in the Philippines, which enabled them to take advantage of the nickel boom there.

Intertek is currently enjoying the growth in the coal industry, as are drilling companies such as Boart Longyear, encouraged by the arrival of multinationals like BHP in the Indonesian coal market. There is reluctance on the part of multinational players to move into servicing the coal players. This stems from the pressure of a competitive coal market, where a change in coal rating can lead to a difference in cost for both vendor and purchaser. Another reason for hanging back is that some coal companies are perceived to lag behind the safety standards of the precious metals sector, making entering the market tricky for drilling companies with high safety criteria.

The growth in the coal sector, with new smaller players joining the fray, has led to an increase in demand for consultancy services. This has, in turn, opened up the market for new companies, Indonesian such as Prima Energy Resources and others with foreign expertise such as Britmindo. These companies have taken the overspill work from established companies like SMG. An established provider, SMG have been providing mining advice for Kideco Jaya Agung's East Kalimantan mine site for longer than it has been in Kideco's possession.

Prima Energy Resources (PER) is a young company providing mining management services, which grew out of its founders experiences working in larger companies. Although currently quite small, PMR work for large players like Arutmin. Tri Cahyono Tristiaji, president, PER, felt there were key reasons to choose PER. "We work to international standards (which) are necessary for JV with companies like Arutmin and BHP," said Cahyono. "We apply these standards to our work and have learnt from the big companies." With an understanding of both local needs and companies domestic obligations, PER can use this knowledge to create business alliances.

The arrival of international players to take advantage of the coal reserves means that having international standards and ISO certifications will become a key factor in winning contracts. This needs to be coupled with local knowledge and understanding to ensure smooth and successful operations.

"Our experience in the field means that we can get people on the ground quickly and set up an efficient system in a small amount of time. It comes down to knowing how the local manpower services work, where are the laboratories, which are the good laboratories, who are the reliable drilling contractors etc," said Brett Gunter, president of GMT, a general consulting firm and exploration contractor. This assistance is key in minimizing the disruption in operations and means that international companies can come in and start operations quickly and safely.

Knowledge of the market and potential partner companies has enabled explosives company AEL to create a partnership to manufacture non-electric detonators. Patrick Foo, general manager AEL Australia, explained advantages of this relationship "AEL provides world class knowledge, assembling locally means goods are sourced locally and increases employment. Now foreign exchange stays in Indonesia and AEL gets a manufacturing foothold."

Challenges of Working in Indonesia

Indonesia has a reputation as a difficult place to work in. Challenges are multiple and include the weather, terrain and cultural background. The safety records of the drilling companies and the high level of services provided by laboratories and engineering companies indicate that these challenges can be overcome. As Stephen Southern, general manager, Intertek Labs, outlined, "you have to bear in mind the conditions within the country and design strategies for dealing with

Exploration drilling in the Philippines.

Priyo Pribadi Soemarno, executive director of the Indonesian Mining Association.

them and for the use of local materials and experience, rather than attempting to use expensive imported goods and methods," said Southern.

Similar to every other country hosting a mining industry, Indonesia is currently trying to meet the challenge of staffing shortages. R. Lee, president, JDA Associates, a specialist recruitment company, finds it difficult to attract expatriate workers to Indonesia, particularly now that wages are so high in countries like Australia. High wages abroad are also causing a domestic labor shortage as Indonesian engineers and geologists are increasingly in demand in the Middle East.

Yet the challenges don't only lie with experienced staff. Contracting companies like Thiess also educate their employees and families on the importance of diet and getting adequate rest before coming to work. When driving a 205-mt haul truck any lapse in concentration could have serious repercussions for driver, contractor and mine owner.

There continue to be infrastructure issues. Foo explained the logistical challenges of operating in the country: "Shipping logistics are also a challenge. The quantum growth of mining companies and their increased consumption and production has put additional stress on suppliers and logistics co-ordinators," said Foo. Yet most multi-national companies, with established communication lines can surmount these issues and operate effectively in the country with its geographical links to Australia and Asia.

The high standards required by international companies are raising the standards throughout the services sector. Priyo Pribadi Soemarno, executive director of the Indonesian Mining Association outlined what the services companies can bring to the sector. "Technology from outside has to be adapted by the service companies to make operations more efficient."

Taking advantages of Indonesia's unique geology and geography remains challenging, but is a task that does not have to be taken on alone.

High wages abroad are also causing a domestic labor shortage as Indonesian engineers and geologists are increasingly in demand in the Middle East.

White Coal Technology

Dave McKay, Chief Indonesian Representative, White Energy Company and Global Business Reports gives a progress report

What does White Coal technology do?

Developed over a number of years by the Commonwealth Scientific & Industrial Research Organization (CSIRO) in conjunction with the White Energy Co, White Coal Technology can process low cost, poor quality sub-bituminous coal into higher quality (from ~8,000 Btu/lb or 4,500 kcal/kg to ~11,000 Btu/lb or 6,200 kcal/kg as delivered to the customer) and higher value coal (from US$12/ton mt to more than US$50/ton mt). An even greater calorific upgrade can be achieved when processing brown coal.

How does the technology work?

The process works by reducing the water content of low rank coals. Worldwide there is currently up to 200 years of proven coal reserves at current rates of production. More than 400 billion mt of these reserves are in the form of sub-bituminous and brown coals. These coals are high in moisture and low in energy content; characteristics that render them economically and environmentally inefficient and more costly to transport over long distances. The moisture content of sub-bituminous coals typically ranges between 20% and 30%. Logistically speaking that means for every three carriage loads of actual energy-producing coal, there is around one carriage load of water.

With younger brown coals moisture levels can be as high as 50%. When used in a coal-fired power station, this water will absorb energy released by the coal combustion, turning it into steam before any energy is available for use in power generation. In addition, the presence of moisture leads to a lower flame temperature which results in less efficient heat transfer in the power station boiler.

What are the benefits of your technology?

The chief benefit is environmental, as the cut in transport loads will significantly reduce the amount of CO_2 produced. Another environmental advantage is that when the briquettes are burnt in a power station the emissions are cleaner, resulting in less noxious byproducts. The technology also benefits the communities surrounding the mine as processed coal releases significantly less dust into the air than untreated coal.

The process creates physically and chemically stable coal, which makes spontaneous combustion less likely and means it is easier and safer to handle, transport and store.

Unless the coal has a unique selling point, such as low sulphur sub-bituminous coal in the United States market or low sulphur and ash sub-bituminous coal from Indonesia, its market is limited. White Coal Technology, however, can increase the calorific quantity of lower grade sub-bituminous and brown coals, thereby helping it gain access to markets previously dominated by higher grade and value bituminous thermal coals.

Why is White Energy focusing on Indonesia?

Our technology can help a number of coal producing countries but it is particularly relavent in Indonesia. The coal resources of Indonesia are for the most part low ranked coals, that are of marginal economic value at the moment. The technology helps Indonesian producers take low rank coal to an export quality product. Subsequently our technology helps Indonesia add value to its reserves and increases international coal supply.

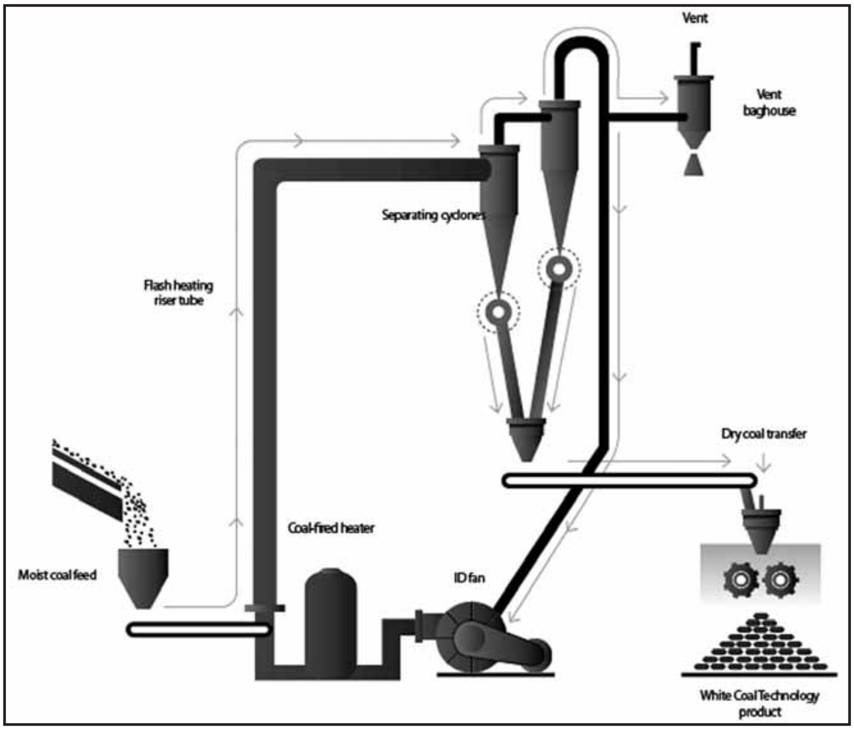
Last year we incorporated a company called PT Kaltim Supacore who are now in the process of constructing a one million ton per annum briquetting plant in East Kalimantan—our first large scale operating plant. We have very advanced negotiations in the U.S. and interest from China as well. The Indonesian operation will be the poster child for this company.

What are your short to medium-term market objectives?

Cearly market development for coal is driven by its price and that of comparable fuels. There is a lot of potential to increase output, perhaps by as much as 30% to 40% over the next four years. However, any growth above that figure would be constrained by the challenges of increasing infratructure. Indonesia is different to many other coal producers as much of its infrastructure is formed of river systems, barges and shipping but many of these low ranked coal deposits are not easily accessable to ports and shipping. Substantial investment in ports, railways etc would be needed to unlock a lot of these areas. That will happen provided that investment climate remains as it is and prices don't fall too dramatically.

Indonesia has enormous reserves of coal, particularly low-ranked sub-cutaneous coals The demand from China and India—indeed Asia generally—is going to increase. Indonesia is one of the few countries with the coal resources to help meet that demand. So Indonesia is very well placed to take advantage of increasing coal demand over the next 10 years.

The spread of White Coal Technology will be driven by the high demand for coal. Strong prices would offer producers of low rank coal even more incentive to adopt the technology.



A schematic diagram illustrates the White Coal Technology process.

Do you recieve support from the Indonesian Government?

The Indonesian Government recognises that new technologies like ours are necessary to maximize the resources of the country and have participated in various workshops and conferences. However, we've had no direct support or assistance from the Indonesian Government, it is essentially a commercial propostion for those companies that want to participate.