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MINING & ENERGY

SPECIAL EDITION 2024/25

- Project updates
- Exclusive interviews
- Market trends & insights

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Welcome

Welcome to *Business Advantage PNG*'s very first Mining and Energy Special Edition.

Business Advantage International has been covering business in Papua New Guinea, including its mining and energy sector, since 2006, when we published our first annual snapshot of PNG's economy, *Business Advantage PNG*.

On the eve of its 20th edition, *Business Advantage PNG* is now the most established and respected business publication in PNG. In print, and online at businessadvantagepng.com, our journalism, based on exclusive interviews with business leaders and in-country research, has a genuine worldwide readership.

Nowhere else in the Pacific does mining and energy – PNG's largest export industry – play such an important role. In our view, it has deserved its own stand-alone, high quality publication for some time.

In preparing this special edition, we've interviewed a lot of key industry executives, both within PNG and internationally, in both majors and juniors. We've also talked to many that supply products and services to the sector.

We have found an industry on the cusp of significant change and exposed to global factors as never before. At the same time, we have discovered extraordinary passion, resilience, technical expertise and acumen, in a country which hosts successful long-term resources projects and has enormous potential for more.

"Most of PNG hasn't been touched: only the easiest of the easiest has been found," a senior industry figure told me back in 2006, speaking of mineral discoveries to that date.

While PNG's resources sector has progressed significantly since then, notably joining the exclusive clubs of LNG and nickel exporters, that remark still remains substantially true. Our thanks to all the industry professionals who helped us understand more about the sector. I hope you enjoy reading about this extraordinary industry.

Andrew Wilkins
Publishing Director
Business Advantage International

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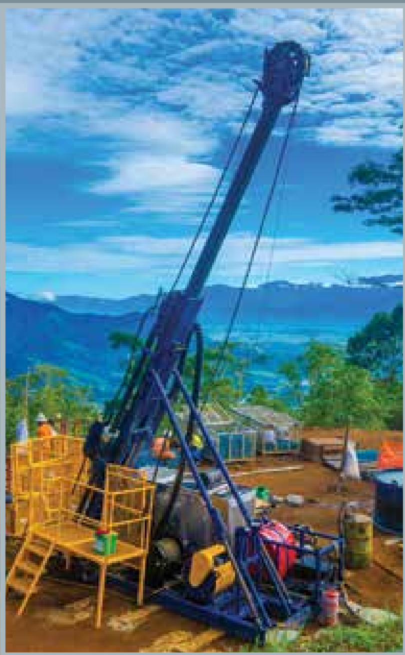
CONTENTS



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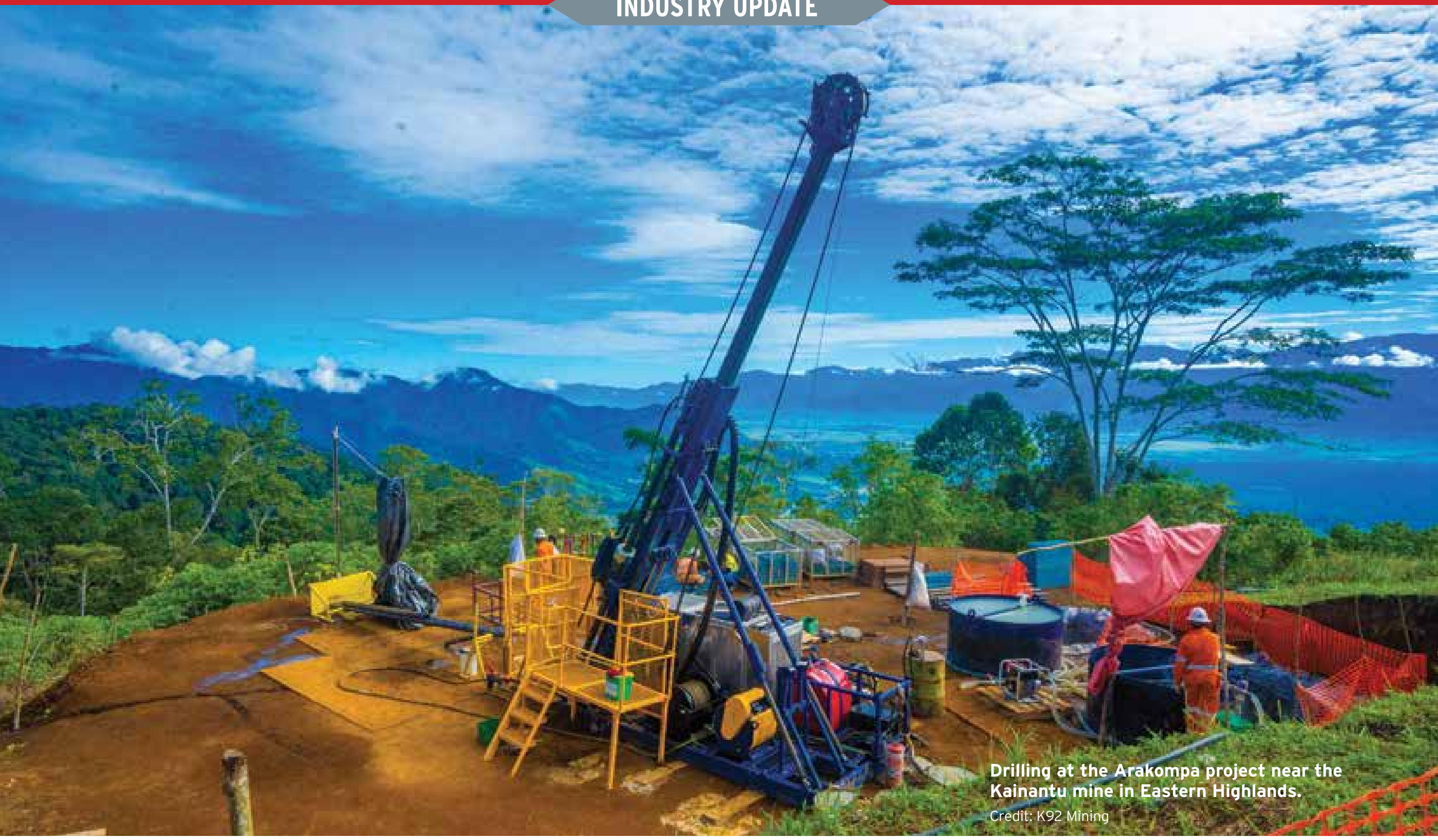

Drilling at the Arakompa project near the Kainantu mine in Eastern Highlands.
Credit: K92 Mining

PNG's project pipeline starts to flow

After a decade focused on existing minerals and hydrocarbons production, Papua New Guinea is gearing up for an anticipated wave of large new investments in its resources sector.

By Nadav Shemer Shlezinger

An estimated US$50 billion pipeline of projects is lining up for development in PNG, led by TotalEnergies' Papua LNG, ExxonMobil's P'nyang and the country's first undersea gas project Pasca A in the liquefied natural gas (LNG) space, and the Wafi-Golpu and Frieda River gold-copper projects in mining.

These would provide a boon for a country that has not had major greenfield resources projects commence production since the ExxonMobil-led PNG LNG project in 2014 and the Ramu nickel mine in 2012.

Green shoots in mining

A powerful signal came in May 2023 when Newmont Corporation, the world's largest gold miner, purchased Australia's Newcrest Mining, giving it a 50 per cent share in Wafi-Golpu and full ownership of Lihir, PNG's largest operating gold mine.

The opportunity to operate in PNG is "something that certainly fits well within our strategy," Newmont Corporation Chief Executive Tom Palmer tells *Business Advantage PNG.*

While a special mining lease for Wafi-Golpu is still ahead, Palmer says the US$5.4 billion block cave project in PNG's Morobe Province "will be developed" (see page 42).

Sarimu Kanu, Managing Director of Kumul Minerals Holdings (KMHL), agrees. He tells *Business Advantage PNG* that the PNG state will exercise its 30 per cent right to the project in full through KMHL, and he believes the parties – South Africa's Harmony Gold is also a participant – are quickly "moving towards an agreement that will be acceptable to everyone."

Another important milestone for the industry came in December 2023, when the Porgera gold mine in Enga Province resumed production after four years' closure. The hard-won deal to reopen the mine leaves Barrick Niugini (BNL, a joint venture of Barrick Gold Corporation and China's Zijin Mining) as operator but provides for a new owner, New Porgera Limited, jointly owned by BNL and PNG stakeholders.

Kumul Minerals Holdings Limited (Kumul Minerals) is a company established and incorporated under the Companies Act 1997. Under the Kumul Minerals Holdings Limited Authorization Act 2015 (Kumul Act):

- We are authorised to operate as a commercial enterprise that principally participate in the mineral sector in Papua New Guinea and abroad.
- We are not an instrumentality of the State and our assets are not public assets.
- We are the nominee of the State to exercise the State option in new mining projects.

The core business of Kumul Minerals covers the entire value chain of the mineral sector. We are a player in the upstream, midstream, and downstream businesses of the mining industry.

Kumul Minerals Holdings Limited is the majority shareholder of Ok Tedi Mining Limited (OTML) - a 100% nationally owned copper mining company that is located in the Western Province of Papua New Guinea. Kumul Minerals owns a 67% share in OTML.

The Government has welcomed Barrick Nuigini Limted (BNL) for partnership under an incorporated joint venture arrangement to mine Porgera once more. First gold, following the resumption of operations at the mine, was poured in January, with Kumul Minerals Holdings Limited owning a 36% share in New Porgera Limited.

KUMUL MINERALS HOLDINGS LIMITED
Kumul Minerals Haus, Port Moresby, Papua New Guinea
PO Box 2032, PORT MORESBY 121, NCD , Papua New Guinea

Still committed to Papua LNG: TotalEnergies' Chairman and Chief Executive, Patrick Pouyanné.
Credit: TotalEnergies.

While full production won't be reached for some time, the reopened mine is already having an economic impact through the employment of 2,500 people, with plans to recruit "between 500 and 700 more", according to Barrick Gold's CEO, Mark Bristow (see interview on page 26).

Notably, under its new ownership and fiscal structure, over 50 per cent of the benefits from the mine will flow to local interests – a benchmark the PNG government has set resources projects under its "Take back PNG" agenda, introduced when Prime Minister James Marape came to power in 2019.

LNG plans

In petroleum and gas, ExxonMobil is working to complete the Angore Pipeline Tie-in Project in Hela Province, connecting it to PNG's only existing gas project, PNG LNG. Natural gas from the US$1.3 billion development is expected to flow to PNG LNG's Hides Gas Conditioning Plant by the end of 2024 (see page 19).

Meanwhile, privately-owned Twinza's US$1.5 billion Pasca A undersea gas project has made progress in 2024, thanks to an agreement with state-owned Mineral Resources Development Company (MRDC), which will see MRDC acquire up to a 50 per cent participating interest in the project.

Development could begin by early 2026 if all regulatory approvals go to schedule, according to Twinza Chairman Stephen Quantrill. Undersea gas is new to PNG but several other companies have Petroleum Prospecting Licences in the Gulf of Papua and are watching Twinza's progress with interest.

These positive signals have been tempered somewhat by the news that a final investment decision (FID) on Papua LNG, the highly anticipated US$10 billion-plus project being led by TotalEnergies, has been pushed back to late 2025 or early 2026 (see page 20).

In an April 2024 statement, Patrick Pouyanné, Chairman and Chief Executive of TotalEnergies, confirmed that the French multinational and its partners ExxonMobil, Santos, JX Nippon and state-owned Kumul Petroleum Holdings (KPHL) remain fully committed to the project.

However, high prices for engineering, procurement and construction have led the venture partners to review the costs of the project.

"We're working with the joint venture to reset the FEED [front end engineering and design] phase of the project," confirmed Santos Managing Director and CEO, Kevin Gallagher, in an August 2024 earnings call.

"The best estimate I would give you right now is that the joint venture would be looking to line up an FID towards the end of 2025."

'Mountain of gold on a lake of oil'

Resources have been the backbone of the PNG economy since the now-closed Panguna copper-gold mine in Bougainville underpinned the country's move to independence from Australia in 1975.

PNG currently has seven mines in operation, and it is ranked 10th in the world for mining's contribution to its economy in 2022, according to the International Council on

> IF A SUBSTANTIAL PRESENCE OF MAJORS ISN'T ENOUGH ON ITS OWN TO ATTRACT ENTRY INVESTORS TO PNG'S RESOURCES SECTOR, THEN THE COUNTRY'S GEOLOGICAL PROSPECTIVITY SHOULD BE.

PIPELINE OF MAJOR GREENFIELD EXTRACTIVE SECTOR PROJECTS IN PNG

Project	Province	Shareholders	Total capex (US$bn)	Annual output	Construction	Production
Papua LNG	Gulf	TotalEnergies, 37.55%, ExxonMobil, 37.04%, Santos, 22.83%, JX Nippon, 2.58%	10+	5.6 million tonnes LNG	2026	2030
Pasca A	Gulf (offshore)	Twinza, 50% Mineral Resources Development Co., 50%	1.5	7 million barrels hydrocarbon liquids /750,000 tonnes LNG	2026	2028/31
Wafi-Golpu	Morobe	Newmont 50%, Harmony Gold, 50%	5.4	161,000 tonnes copper; 266,000 ounces gold	2027	2030
Frieda River	Sandaun	PanAust	7.2	175,000 tonnes copper; 230,000 ounces gold	2029	2035
P'nyang LNG	Western	ExxonMobil-Ampolex JV, 49%; Santos 38.5%, JX Nippon 12.5%	11	2.7 million tonnes LNG	2030	2034

Sources: company statements to *Business Advantage PNG* and public statements. All dates and figures are forecasts only.

INDUSTRY FACES REGULATORY CHANGES

Since the government of Prime Minister James Marape came to power in 2019, a number of key reforms to the way the mining and energy sector is regulated have been flagged.

Key among these is a shift from a royalty tax-based concession system towards a production sharing fiscal regime for petroleum, and the creation of a new National Petroleum Authority.

"We will consult with key stakeholders as we progress work on the fiscal regime shift," promised Minister for Energy Thomas Opa at an industry event in July 2024.

On the mining side, industry has been most preoccupied by plans to build a state-owned gold refinery.

The proposed National Gold Corporation (NGC) Bill includes plans for a gold refinery run by private Singaporean firm Refinery Holdings Limited.

The plan has received criticism from various quarters of the mining sector, with peak industry body, the PNG Chamber of Resources and Energy (PNG CORE), labelling it "disastrous" and claiming that it "will effectively create a gold monopoly."

James Scobie and Dr Michael Dyson, directors of Refinery Holdings, say the bill's effect will be less dramatic.

"The NGC Bill does not change the long standing PNG law that miners own the gold and precious metals they mine, or that they may sell to anyone they wish to,

An operations room at Lihir, PNG's largest gold mine.
Credit: Newmont

as they do now," they tell *Business Advantage PNG*. "It only requires that all gold and precious metals be first refined to international investment grade standard by the [proposed] National Mint before the refined gold and precious metals are exported."

Kumul Minerals Holdings is the state nominee to participate in downstream processing of gold and other minerals. Its Managing Director, Sarimu Kanu, says a definitive feasibility study into a refinery is "well under way" and will be completed by 2025.

Papua New Guinea in brief

Population	11.8 million (National Statistical Office)
Capital	Port Moresby
Surface area	463,000 sq km
People	Melanesian, Papuan, Negrito, Micronesian, Polynesian
Time zone	GMT +10 hrs
Business language	English
Political status	Parliamentary democracy
GDP	US$28.25 billion (2023, IMF)
GDP growth	5 per cent (2024 forecast, IMF)
Inflation	4.0 per cent (2024 forecast, IMF)
Currency	PNG Kina (1 PGK = 0.252 USD, September 2024)
Hydrocarbons exports – total value	K25.18 billion (US$6.41 billion) in 12 months ending September 2023 (Source: Bank of PNG)
Hydrocarbons exports – breakdown	LNG – K21.48 billion; crude oil – K2.00 billion; condensate – K1.69 billion (Source: Bank of PNG)
Mining exports – total	K 14.39 billion (US$3.66 billion) in 12 months ending September 2023 (Source: Bank of PNG)
Mining exports – breakdown	Gold – K8.00 billion; nickel – K3.30 billion; copper – K2.60 billion; cobalt – K0.49 billion (Source: Bank of PNG)

Mining & Metals.

Moreover, thanks to PNG LNG, the International Group of LNG Importers (GIIGNL) reported PNG was the world's 10th largest exporter of LNG in 2023.

PNG boasts an impressive concentration of major resources companies. ExxonMobil and TotalEnergies, two of the top three oil and gas supermajors by revenue, are both heavily invested in the country. Newmont and Barrick Gold are the world's two biggest gold producers, and PNG is the only country outside of the Americas where both companies have operating mines.

If a substantial presence of majors isn't enough on its own to attract entry investors to PNG's resources sector, then the country's geological prospectivity should be. Colloquially, PNG has earned a reputation for being a "mountain of gold floating on a lake of oil."

The country sits on the Pacific's "Ring of Fire", an arc stretching from PNG to southern Chile which hosts most of the world's large copper-gold porphyry deposits.

A 2013 United States Geological Survey report estimated that PNG had undiscovered porphyry resources containing 61.7 million metric tonnes of copper (compared to the 33.9 million tonnes in known resources at the time) and 4,062 tonnes of gold (known resources: 2,412 tonnes).

In petroleum and gas, PNG is equally prospective, with an estimated 25 trillion cubic feet of gas reserves already identified.

ECONOMIC UPDATE ON PNG

By Andrew Wilkins

While new resources projects look set to lead Papua New Guinea's next decade of growth, there are positive signs already in the country's economy, as it emerges from the post-COVID recovery period.

According to the Asian Development Bank, PNG's GDP is on track to grow by 3.3 per cent in 2024 and 4.6 per cent in 2025 – slightly ahead of the Pacific sub-region as a whole.

Badly needed investment in infrastructure is particularly notable, as PNG's economy "tools up" for this expected growth.

The nation's ports, roads, airports, power grids and roads are being upgraded with international donor support, national airline Air Niugini is being re-fleeted, and several new industrial parks are under construction.

Some of these parks are set to take advantage of new Special Economic Zone (SEZ) provisions being introduced by the government, as is PNG's first tourism SEZ at Port Moresby's Paga Hill.

At the same time, the country is embracing digitisation, with its private and public telecommunications networks expanding quickly to accommodate exponential growth in data volumes (see page 55) and a major digital government push.

In manufacturing, there are also new investments from major international companies such as Coca-Cola Europacific Partners, Nestlé and Goodman Fielder.

As with any frontier market, PNG is not without its challenges. Long-term shortages of foreign exchange have constrained growth for a decade, while security/law and order, unreliable utilities and a lack of government capacity are major impediments nominated in the *Business Advantage PNG*/Westpac PNG 100 CEO Survey.

The planned Paga Hill Estate in Port Moresby.
Credit: Paga Hill Development Co

Businesses in PNG tend to be adaptable and resourceful in the face of these tough yet rewarding operating conditions.

"Like most PNG businesses, we are cautiously optimistic," Mark Robinson, CEO of BSP (the country's largest bank) told me recently, speaking of the year ahead.

In 2023, PNG commenced a program with the International Monetary Fund to address forex shortages and also put government debt and deficits at more sustainable levels. More forex is already flowing, with a managed reduction in the value of the PNG's currency, the kina, to be expected.

The extension of the life of PNG's oldest active mine, OK Tedi, out to 2050, plus the reopening of the Porgera gold mine and the continued expansion of Kainantu are also helping, as will the Angore resource being bolted on to ExxonMobil's PNG LNG project.

Exploration fluctuation

Mineral exploration has fluctuated heavily since independence, regularly topping US$100 million per year (K397 million at current exchange rate) in the 1980s and 1990s, dropping to K15 million in 2002 and then rapidly rising towards a record K606 million in 2013. But it has fallen since with no signs yet of a rebound, despite a pickup in global exploration (see page 48).

Speaking at an industry conference in July 2024, Jerry Garry, Managing Director of PNG's mining regulator, the Mineral Resources Authority, said negative perceptions about law and order, a lack of geoscientific data, and long turnaround times for licences had all contributed to the decline in spend.

Lack of infrastructure in remote parts of PNG can be another challenge, with most resource developers obliged to build their own key infrastructure such as power plants, access roads and airstrips – a factor the country's Infrastructure Tax Credit scheme is partly designed to address.

Join the queue

And yet, despite the challenges, investors remain excited about the opportunities in PNG's resources sector.

Indeed, for some, the biggest consideration is how to position themselves in the queue for development in a developing country with capacity constraints. For instance, the queue for large resources project development is already notionally lined up until the mid-2030s.

As Phil McCormack, Project Director for Frieda River, notes: "There are some large-scale projects in PNG. The government is not geared up to deliver four or five multi-billion dollar projects at the same time. [But] I don't think Australia could do the same either." ◆

LNG AND METALS LOOK A STRONG BET

The outlook is positive for the key commodity exports that will support PNG's resources sector in coming decades. Nadav Shemer Shlezinger talks to the analysts to find out why.

As a significant producer of liquefied natural gas (LNG) and gold, and with plans to expand its substantial copper resources, Papua New Guinea is well placed for the future.

LNG prices are likely to "remain higher than most people speculate" in the coming years due to a lack of new investments globally, Westpac's Senior Economist Justin Smirk tells *Business Advantage PNG*.

In fact, Smirk says, the outlook is "more optimistic" and "less uncertain" than when the PNG LNG project commenced in 2014.

PNG's proximity to Asia puts it in a particularly strong position. Asia received 261 million tonnes of LNG imports in 2023, 65 per cent of the world's total, according to the International Group of Liquefied Natural Gas Importers.

While demand is falling in traditional markets that are moving away from carbon-based energy, such as Japan, South Korea and the European Union, independent commodities analyst David Lennox notes it is increasing in China, which requires "huge quantities" of LNG to keep the wheels of its economy operating.

"PNG is closer to the sources of demand that we're now seeing. It's a significant player for those suppliers and customers who are looking for a competitive edge in terms of the cost of shipping," Lennox says.

Gold in an unpredictable world

Meanwhile, the gold price has surged in 2024, breaking out from the roughly US$1,600 to US$2,000 per ounce (oz) that it traded at for most of 2020 to 2023 – already historical highs – to an all-time record of almost US$2,600/oz at time of writing.

Soni Kumari, Commodities Strategist at ANZ, tells *Business Advantage PNG* that the base price for gold has shifted and prices are unlikely to fall below US$2,000/oz in the foreseeable future.

The geopolitical instability that began with Russia's invasion of Ukraine triggered "a shift in central bank positions, who want to increase more of their gold reserves," she says.

United States treasury bills are no longer considered as safe as they once were, Kumari says, adding that "China and the BRICS countries are uniting together, because they see the risk that can be imposed if there is just one reserve currency."

This fast-changing situation is likely to "support gold demand," she says.

Kumari and Smirk both note that an impending rate-cut cycle in the United States (which began on 19 September 2024, when its Federal Reserve cut its target interest rate by half a point), and the likelihood of this weakening the US dollar, would also be supportive of gold.

Copper and tech innovation

Copper is of strong interest to PNG in the long-term, given the plans to develop the Wafi-Golpu and Frieda River projects, which are forecast between them to produce 336,000 tonnes of copper per year by 2036.

Indeed, the potential to increase Newmont Corporation's exposure to copper was a "fundamental premise" behind its 2023 acquisition of Newcrest Mining, the previous co-owner of Wafi-Golpu. Newmont CEO Tom Palmer believes artificial intelligence and data centres are rapidly emerging as a new demand driver for copper, alongside the green energy transition.

This assessment is supported by figures from the International Energy Agency (IEA), which says that data centres consumed 460 terawatt hours in 2022, representing around 2 per cent of all global electricity usage. This could more than double by 2026, according to the IEA.

Copper prices have also been buffered by supply issues, with Kumari noting that the top three producers – Chile, Peru and the Democratic Republic of Congo, which together produce 46 per cent of the world's copper – "are not very stable."

Smirk forecasts that the lack of new investments in copper, overlaid with growth in demand, will see "an underlying upward trend" in the real copper price.

"I would argue that, if you find rich sources of copper to mine within PNG, they become very valuable in long term cycles," he says. "I'm quite bullish on copper."

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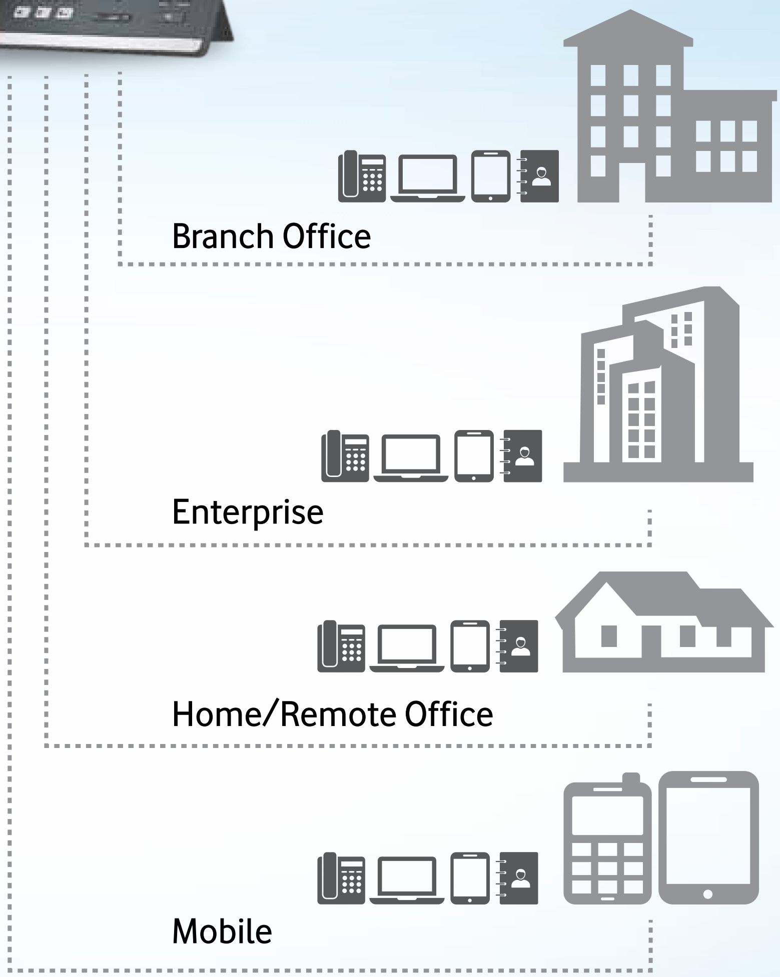

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Perspectives

Business leaders provide their personal takes on Papua New Guinea's mining and petroleum sectors.

“PNG is a country with a lot of natural resources.

It's a country that's strategically important to Australia and the United States. As a US foreign direct investor in PNG, with Australian connections, the opportunity for us to work in that country, to develop relationships over the long-term with all stakeholders, with the support of both the Australian and the US governments, is something that certainly fits well within our strategy.”

Tom Palmer
President & Chief Executive, Newmont Corporation

“The delay to Papua LNG has not been good for the country but, in hindsight, it has been good for the economics and feasibility of the project.

If we were to reach FID this year, plus a four-year construction period, that would bring us to 2028, when analysts are telling us that the market for LNG will be very soft. Now, we are shifting the project to maybe 2029 or 2030, when prices [are expected to] pick up again. We are in a stronger position to get a better price.”

Wapu Sonk
Managing Director, Kumul Petroleum Holdings

“The Porgera mine provides a huge opportunity for both the Porgera Valley and Papua New Guinea.

As a global gold and copper miner, we are intrigued by the opportunity to grow our footprint in PNG, but it's subject to being able to deliver on our business objectives. There's no doubt that Papua New Guinea has a significant amount of mineral endowments.”

Mark Bristow
President & Chief Executive, Barrick Gold Corporation

We are exporting [metals] in a raw form and missing out on some value.

We would like to value-add so that Papua New Guinea can greater benefit from the resources that we are blessed with. If you look across the border at Indonesia, that is basically the model we would like to drive.

Sarimu Kanu
Managing Director, Kumul Mineral Holdings

We're working on the idea that we're [following] behind Wafi. That way you will see a skilled workforce being developed in PNG.

They'll come off the gas project(s) and go onto Wafi, then they'll come onto the Frieda project. That way, rather than a single seven-year hit of everyone building their project at the same time, you'll see sustained growth within PNG.

Phil McCormack
Project Director, Frieda River, PanAust

Thanks to the national, provincial and local level governments, our co-venture partners – including Mineral Resources Development Company and Kumul Petroleum Holdings Limited – our LANCOs, local communities, landowner leaders and other business partners, we are incredibly excited for LNG's next decade and beyond in Papua New Guinea.

The country's LNG future looks bright.

Tera Shandro
Chairperson and Managing Director ExxonMobil PNG

The Hides Gas Conditioning Plant, part of the PNG LNG project, in Hela Province. The plant can process one billion cubic feet of gas per day.
Credit: ExxonMobil

PNG LNG's decade of achievement

2024 marks the tenth anniversary of PNG joining the exclusive club of gas-exporting countries. *Business Advantage PNG* takes a close look at the project that made it happen, and what lies ahead.

By Andrew Wilkins

The ExxonMobil-led PNG LNG project, which commenced production in 2014, was a project many years in making, from the time gas was first discovered in Hides in 1987, through to first LNG exports in May 2014 (see timeline on page 18).

With a price tag of US$19 billion, the project remains the single largest investment ever made in the country and gas has been PNG's biggest export commodity ever since.

The project itself connects gas fields to a conditioning plant in PNG's Highlands and then via a 700km land and sea pipeline to an LNG plant at Caution Bay near Port Moresby, where gas is processed for export by tanker.

According to Thomas Opa, PNG's Minister for Energy, around 40 per cent of PNG's 25 trillion cubic feet (TCF) of recoverable gas reserves will be committed to PNG LNG over the next 36 years.

Some 80 million tonnes of gas have been produced since production started, with 1,068 shipments of gas delivered to customers in Japan, Taiwan and China.

PNG LNG IN A NUTSHELL

Type: Integrated project including gas production and processing facilities
Province: Hela, Southern Highlands, Western, Gulf and Central Provinces
Annual production: 8.5 million tonnes LNG (2023)
Ownership: ExxonMobil, 33.2%, Santos, 42.5%, Kumul Petroleum Holdings, 16.8%, JX Nippon Oil & Gas Exploration, 4.7%, Mineral Resources Development Company, 2.8%

While ExxonMobil is PNG LNG's operator, there are four other venture partners: Santos, state nominee Kumul Petroleum (KPHL), JX Nippon Oil and Gas Exploration and the Mineral Resources Development Company (MRDC).

State-owned MRDC represents the interests of the landowners on which the project sits. A deal for KPHL to buy a further interest in the project from Santos was in progress at the time of writing.

Benefits

As the country's first LNG project, PNG LNG has acted as a catalyst for skills and capacity development locally. The project employs over 3,700 workers, 90 per cent of whom are Papua New Guinean. Some K15 billion has also been spent with PNG businesses, many of them landowner-owned.

"ExxonMobil has focused on opportunities to grow our business in PNG through a shared vision and collaboration with all levels of government, local business, partners, and our diverse landowner communities," said ExxonMobil PNG's Chairperson and Managing Director Tera Shandro, in a speech to commemorate the project's 10th anniversary in July 2024.

"In this way, together, we have built a resilient, successful, and globally respected LNG industry in the country."

KUMUL
KUMUL CONSOLIDATED HOLDINGS

STATE ASSETS TARGETING PRIVATE SECTOR INVESTMENT

Kumul Consolidated Holdings (KCH), acting as the Trustee of the General Business Trust representing the Government and people of Papua New Guinea, is embarking on a strategy to attract private sector investment in certain state assets. These assets, which encompass vital sectors such as water, power, ports, airlines, telecommunications, postal services, logistics, agriculture, and development finance, are being revitalized under the guidance of KCH.

As part of its broader responsibilities of managing and supervising the country's non-mining and non-mineral state enterprises, KCH is actively pursuing the redevelopment of dormant state assets, including the former Port Moresby port site. The aim is to leverage private sector involvement in the redevelopment process and unlock the potential of these strategic assets for the benefit of Papua New Guinea.

In so doing, according to Managing Director Professor David Kavanamur, it is hoping to work more closely with private investors.

'We are moving away from one hundred per cent state ownership and working on strategies to improve state-owned enterprises' (SOEs') contribution to GDP: to sweat the assets, to improve returns,' he told the 2023 Business Advantage PNG Investment Conference.

'Now for the first time, you've got an investment strategy – and clear strategic asset allocation built into the investment strategy – to guide the government's investment.'

REVIVING ASSETS

While the partial privatisation of Telikom Limited is an ongoing project (PNG's two major super funds made an offer), KCH is also now seeking to partner with the private sector to redevelop some of its land-based assets.

The big-ticket item is undoubtedly Port Moresby's old port site – vacant since 2018, when the port relocated to Motukea Island.

The waterfront site offers the opportunity to connect the busy suburb of Konedobu with Port Moresby's Downtown CBD and the planned Paga Hill special economic tourism zone (with its planned Radisson Blu resort).

KCH is considering a number of redevelopment options for the site, aligned with the National Capital Development Commission's Urban Development Plan. These include developing the precinct into a commercial and residential area, a tourism destination and mixed-use development.

AGRICULTURE

KCH is also looking to attract private sector investment in two of its large agricultural assets: the 2300-hectare Dylup Plantation in Madang Province and the 1089-hectare Cape Rodney Estate in Central Province.

Dylup, about an hour north of Madang, has a mix of existing cocoa and copra plantations and undeveloped land, some of which has reverted to forest.

According to KCH, there is potential for hemp and tropical fruit growing, as well as downstream processing of our core crops including coconut and cocoa at the site. A US-based agricultural consultancy has been engaged to develop a business plan for the plantation.

'With that business plan, we're going to go back to market, and you can bid for the opportunity to partner or invest in the plantation,' said Kavanamur.

Cape Rodney is currently the site of a rubber plantation and factory but also has vacant land suitable for a variety of crops, including cocoa and palm oil.

INVESTMENT MODELS

While KCH will hold onto an equity interest in these redevelopment projects in return for making the land available, Kavanamur says it is looking to the private sector to invest capital to finance these projects and is one to exploring different investment models.

'We are looking at different modalities to partner with the private sector: franchises, public private partnerships, build-own-operate-and-transfer, joint ventures, consortia and so on,' says Kavanamur.

KCH already has a track record in this area, with minority stakes in two established joint ventures with Innovative Agro-Industry: a 20 per cent stake in the Ilimo Dairy Farm outside Port Moresby, and a 43 per cent stake in Sepik Agro Industrial Centre Ltd in East Sepik.

Kumul Consolidated Holdings (KCH) was established under the Kumul Consolidated Holdings Act 2002.

KCH is the Trustee of the General Business Trust on behalf of the Government and people of Papua New Guinea.

KCH and its SOEs, hold the backbone infrastructure for PNG in water, power, ports, airlines, telecommunications, postal services, logistics, agriculture and development finance.

While the construction phase almost doubled the size of PNG's economy, there have been longer-term benefits too.

As of April 2024, revenues delivered to the state from the project stood at K26 billion (US$6.6 billion) in tax, royalties, development levies and payments to the MRDC and KPHL.

Future LNG

ExxonMobil and its venture partners have plans to expand their footprint in PNG well beyond the PNG LNG project in coming years.

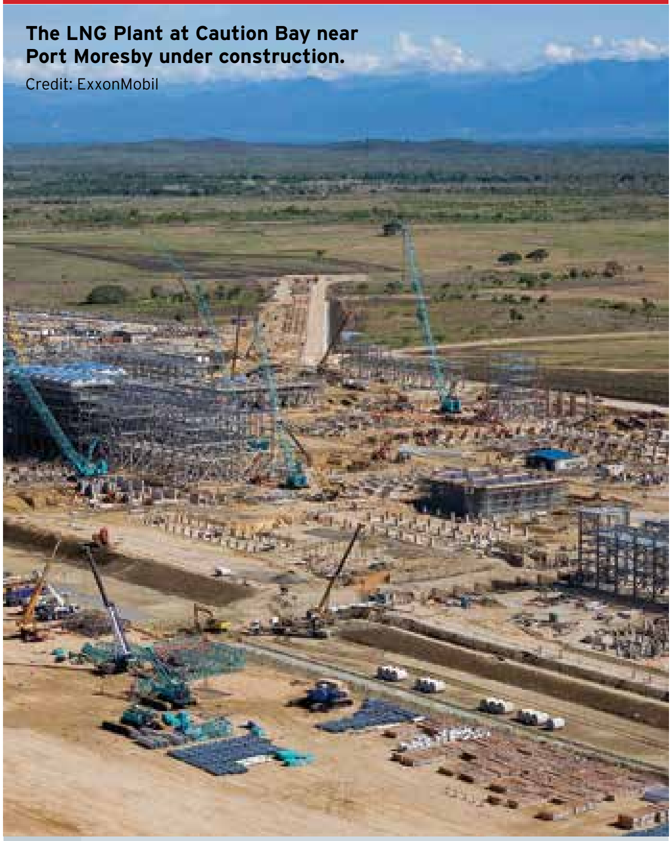
In February 2022, the state executed a gas agreement with ExxonMobil, Santos and JX Nippon for the P'nyang gas project, which is based on an estimated 4.36 TCF of gas reserves in PNG's Western Province.

P'nyang's four-year construction period is planned to begin once the TotalEnergies-led Papua LNG project goes into production (currently expected around 2030 – see page 20). Before then, the focus will be on the project development concept, early works and Infrastructure Tax Credit projects.

Looking further ahead, ExxonMobil suggests the Wildebeest prospect in the Eastern Fold Belt of Gulf Province has the potential to become the largest discovery in the country's history. If successful, it could expand the construction window for LNG projects out to 13 years.

"These projects will not only continue to elevate PNG as an LNG-exporting nation, but also generate thousands of jobs and billions of kina in economic activity," said Shandro. ◆

The long journey towards PNG's first LNG project



The LNG Plant at Caution Bay near Port Moresby under construction.

Credit: ExxonMobil

1987	The Hides gas field is discovered in PNG's Highlands by BP and Oil Search Limited.
1990	Gas production commences at Hides for power generation.
1995	Chevron first proposes a PNG Gas Project to export gas from Hides and adjacent fields to Australia via a pipeline.
1998	BP sells its PNG upstream oil and gas assets to Oil Search Ltd.
2003	Chevron sells its PNG oil and gas assets to Oil Search Ltd.
2004	Interest in the PNG Gas Project is revived by ExxonMobil subsidiary Esso Highlands, Oil Search and an AGL-Petronas consortium. Front end engineering and design (FEED) commences.
2006	FEED is discontinued after AGL consortium pulls out.
2008	*Business Advantage PNG* reports the now re-named PNG LNG project - based on the Hides, Angore and Juha gas fields - has been remodelled without an international pipeline. Gas Agreement signed between the venture partners Esso Highlands, Nippon Oil Exploration, Santos and the PNG State. Project goes into FEED.
2009	Final investment decision in PNG LNG made, and early works begin. "We're confident of delivering first LNG in 2014," Venture Manager Peter Graham tells *Business Advantage PNG*.
2010	Gas sales, financing and purchasing agreements completed. Project construction begins.
2012	First plane lands at newly-completed Komo Airfield in Hela Province. PNG's longest runway at 3.2 km is built for the project.
2014	Construction completed. PNG LNG goes into production. PNG's first LNG export cargo departs aboard the *Spirit of Hela* on 25 May. "The Government recognised very early on that this was a transformational project. That truly was critical from the outset," Peter Graham reflects to *Business Advantage PNG*.

WHAT'S NEXT FOR PNG LNG?

With the PNG LNG project consistently producing above its boilerplate capacity, the focus is now moving to bringing more gas reserves into the project.

Part of the original PNG LNG development plan, the K5 billion (US$1.28 billion) Angore Pipeline Tie-In Project is the largest natural gas development currently underway in PNG.

The project aims to bring more gas reserves into PNG LNG to help backfill and maintain production.

The work will see the Angore field, which holds reserves of around 1 trillion cubic feet (TCF) of gas, connected to the existing PNG LNG project infrastructure via an 11km pipeline to the Hides Gas Conditioning Plant in Hela rovince.

Drilling at Angore was completed in the first half of 2024. According to ExxonMobil PNG's Chairperson and Managing Director Tera Shandro, the tie-in project is expected to be complete before the end of 2024.

Angore will tie into the existing PNG LNG infrastructure, including the LNG Plant at Caution Bay.
Credit: ExxonMobil

After Angore, there's Agogo: an oil and gas field in Southern Highlands Province operated by PNG LNG venture partner, Santos (which also operates the nearby Kutubu, Moran and Gobe oil and gas fields). While Santos exports the oil from these fields itself, the gas is provided to the PNG LNG project. In 2023, according to Santos, they accounted for 22 per cent of PNG LNG gas supply.

The Agogo Production Facility Tie-In Project would see the construction of new production facilities and a 20 km pipeline built to bring another 1 TCF of natural gas online as early as 2028.

Papua LNG still in train

While a final investment decision on the TotalEnergies' US$10 billion-plus Papua LNG project has been pushed back to late 2025 or early 2026, buyer interest in PNG gas continues to be strong.

By Andrew Wilkins

Several factors have combined to delay the final investment decision on Papua LNG, PNG's highly anticipated second gas project.

The project was reporting progress on all the lines of activity in early 2024. However, operator TotalEnergies announced in April 2024 that the project required "more work to reach FID [final investment decision]".

"After receiving first EPC [engineering, procurement and construction] offers, it appears that the project will need to keep working with contractors to obtain commercially viable EPC contracts," the French supermajor said in a statement, after its Chairman and Chief Executive Patrick Pouyanné met with PNG's Prime Minister, James Marape.

"The project will review the structure of some packages and open the competition to an enlarged panel of Asian contractors."

Drilling at the Antelope gas field.
Credit: TotalEnergies

Upstream/downstream

The project, which will draw on the Antelope and Elk gas fields within PRL 15 in Gulf Province, is effectively in two parts. Upstream, TotalEnergies will build nine production wells, a water injection well, a carbon dioxide reinjection well, and a gas processing plant. A 320km pipeline will then bring the processed gas to ExxonMobil's LNG Plant outside Port Moresby, where it will be processed for shipment by up to three new electrical LNG trains.

"As the Papua LNG Delegated Downstream Operator, ExxonMobil is working to ensure all key stakeholders are engaged and regulatory permits for the Papua LNG downstream facilities ... are awarded," said Tera Shandro, Chairperson and Managing Director of ExxonMobil PNG.

"The industrial capability and capacity growth shown across PNG since the early construction days of the PNG LNG project gives us confidence that Papua LNG downstream facilities can achieve an even higher benchmark for national content engagement."

Gas marketing

Another prerequisite for FID is locking in customers for the 5.6 million tonnes (mt) of LNG the project is set to produce annually. Pouyanné notes the "high interest" of several LNG buyers for off-taking LNG from the project due to its location close to key Asian markets.

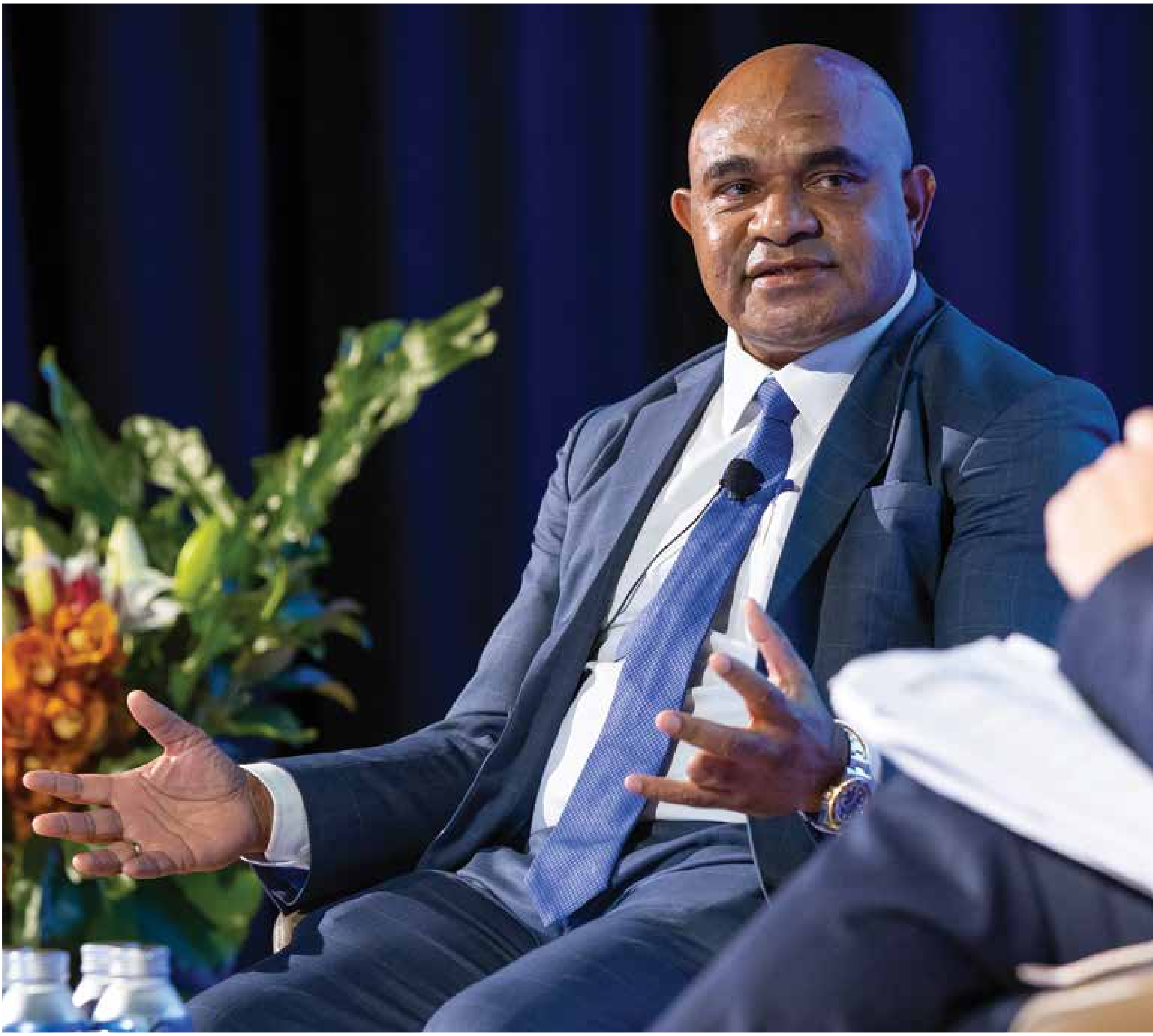
This interest was confirmed in September 2024 when Papua LNG venture partner Santos signed a three year-plus-one-quarter contract to supply Glencore Singapore with 0.5 mt of LNG per annum and a 10-year contract for 0.4 mt annually with Japan's Jokkaido Gas, to be drawn from Santos' global portfolio, including from PNG.

"There continues to be extremely strong demand in Asia for high heating value LNG from projects such as Barossa and PNG LNG," said Santos Managing Director and Chief Executive Officer Kevin Gallagher in a statement.

Financing

Papua LNG must also meet its financing requirements, which include complying with the International Finance Corporation's strict standards set out in the Equator Principles when assessing the potential impact of new fossil-fuel projects.

The construction of the electric LNG trains and the reinjection from day one of carbon dioxide from producing wells into the PRL15 reservoirs, are two key technical choices made by TotalEnergies to lower project emissions. ◆



Papua LNG and beyond

PNG's national petroleum company Kumul Petroleum aims to play a key role in developing and expanding PNG's petroleum and gas sector. In this exclusive interview with *Business Advantage PNG*'s Andrew Wilkins, Managing Director Wapu Sonk outlines plans to leverage its stake in the country's current and future gas projects.

Andrew Wilkins (AW): Given Kumul Petroleum's major stake in the TotalEnergies-led Papua LNG project, can you provide insights into the project's timeline?

Wapu Sonk (WS): There's been some delay in the Papua LNG project. We were expecting to reach FID [final investment decision] in December 2023. That was pushed to about June-July 2024, and now it's been pushed back further because the costs that we got back from all the EPC [engineering, procurement and construction] contractors have been 40 to 50 per cent more than expected.

We were looking at a US$13 billion project. The proposals came in at US$18 billion.

Now, all the different scopes have had to be re-tendered and we've invited other participants to come into the mix. We are looking at FID in the fourth quarter of 2025 or the first quarter of 2026. There is still a project. TotalEnergies is still the operator, and they're working hard with all the EPC proponents to bring that cost down.

> THE DELAY HAS NOT BEEN GOOD FOR THE COUNTRY BUT, IN HINDSIGHT, IT HAS BEEN GOOD FOR THE ECONOMICS AND FEASIBILITY OF THE PROJECT.

Kumul Petroleum Holdings' Wapu Sonk.
Credit: BAI/Stefan Daniljchenko

AW: What role do you see Kumul Petroleum playing in the project?
WS: We're considering marketing our share of Papua LNG ourselves but we haven't made the final decision yet.

The delay has not been good for the country but, in hindsight, it has been good for the economics and feasibility of the project.

If we were to reach FID this year, plus a four-year construction period, that would bring us to 2028, when analysts are telling us that the market for LNG will be very soft. Now we are shifting the project to maybe 2029 or 2030, when prices [are expected to] pick up again, we are in a stronger position to get a better price. We're confident there will be a market for LNG continuing into 2029/2030.

AW: You're building a fabrication facility adjacent to ExxonMobil's LNG plant at Caution Bay outside Port Moresby. How is that progressing?
WS: We need to build the industrial skill [base] to make the large components that [are currently] transported into the country from Singapore, Indonesia or China.

We are building a 20,000 tonne-per-annum capacity fabrication facility. It will have about one thousand people working directly in fabrication and another 3,000 supporting it. That's on top of the 10,000 people working on the construction phase of Papua LNG.

We're looking for the fabrication facility to support the mining and petroleum sectors and general infrastructure in PNG, but we'll also have capacity to export production from the facility into Australia, Indonesia, New Zealand and the Pacific Islands countries.

Construction has already started, and we should be ready to start fabricating by the third quarter of 2025.

AW: What role can Kumul Petroleum play in helping gas exploration and 'stranded' gas assets come to fruition?
WS: We have four PRLs [petroleum retention licenses]: two onshore (Barikewa and Uramu) and two offshore (Kimu and Pandora).

We've done the remapping and re-analysis of all the seismic data that we've got as part of the migration of onshore licenses to us. We've just awarded a contract to OilMin to start the seismic work. It's twofold: one is to prove up the reserves that we think we have. Our second piece is to do a bit more exploration within the licenses that we have, because there is some potential for drilling and discovery.

We've just done the reserve certification for offshore. It's very encouraging. We've upgraded reserves at both Kimu and Pandora. We've got enough reserves for a 1.2 to 1.5 million tonnes per annum floating LNG (FLNG) project.

We had an agreement signed with the LNG project partners to build our own e-train next door to the Papua LNG e-trains, but I think the cost of doing it in Port Moresby is way higher than doing FLNG in the Gulf of Papua. We have had very good interest from the gas supermajors to partner with us. ◆

Alliance drives PNG's first offshore gas project

Twinza and PNG's Mineral Resources Development Company will now work together to advance the Pasca A gas project in the Gulf of Papua. Twinza's Executive Chairman Stephen Quantrill tells *Business Advantage PNG* the deal paves the way for further cooperation.

By Nadav Shemer Shlezinger

Twinza Chairman Stephen Quantrill describes the deal to bring the Mineral Resources Development Company (MRDC) into the proposed Pasca A undersea gas project in PNG's Gulf of Papua as a "genuine strategic alliance."

In May 2024, Twinza and MRDC announced a series of binding agreements which will see MRDC acquire up to a 50 per cent participating interest in the US$1.5 billion project. MRDC will pay US$160 million (K620 million) for its 50 per cent stake.

If all goes to schedule, development of Pasca A could begin as early as 2026.
Credit: Twinza

Charting new waters

Under PNG law, state-owned MRDC manages benefits from oil, gas and mining projects on behalf of landowners and PNG's provincial governments. This has seen it obtain equity stakes of between two and 12 per cent in various resources projects, including a 2.8 per cent interest in the ExxonMobil-led PNG LNG project.

The Pasca A deal differs from other PNG resources projects in that, when fully invested, it gives MRDC an equal equity stake.

"Twinza will be the operator of Pasca A. That's firmly reflected in all our agreements," Quantrill tells *Business Advantage PNG*. "But we'll both treat it in the spirit of a strategic alliance. MRDC will have a clear seat at the table with us on all major strategic and commercial decisions."

Regulatory approvals

The focus now is on securing long-awaited regulatory approvals for the Pasca A project – namely, a gas agreement and a Petroleum Development Licence. Pre-FEED activities and MRDC's initial investment in Pasca A will commence once the gas agreement has been signed.

If all goes to schedule, Quantrill says, development could begin by early 2026 and production by mid-2028.

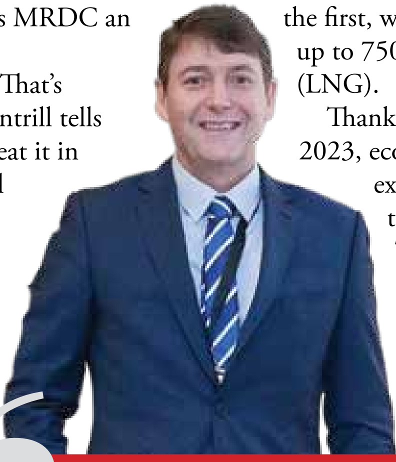
Twinza has invested more than K400 million in Pasca A since acquiring the project in 2008.

It envisages a two-phase development: the first phase (estimated cost US$700 million) will comprise a minimal wellhead platform, a mobile offshore production unit, floating storage and an offloading vessel. It is expected to deliver seven million barrels-equivalent of hydrocarbon liquids per year.

The second phase (estimated cost: US$800 million), which would be completed as soon as three years after the first, will add a Floating LNG facility, producing up to 750,000 tonnes per year of liquefied natural gas (LNG).

Thanks to an updated independent assessment in 2023, economic modelling reflects that Pasca A is now expected to deliver K15 billion in revenues to the state over a 25-year production life.

The study also highlighted Pasca's potential to sequester up to 200 million tonnes of CO_2, which would make the project carbon negative.



MRDC WILL HAVE A CLEAR SEAT AT THE TABLE WITH US ON ALL MAJOR STRATEGIC AND COMMERCIAL DECISIONS.
Stephen Quantrill, Twinza Chairman

Window of opportunity

In addition to the Pasca A deal, Twinza and MRDC also signed a binding agreement to cooperate on the acquisition and development of other oil and gas assets in PNG.

Quantrill says the natural opportunities are in the Gulf of Papua, with "proximate targets that have some sort of synergy with what we're already doing at Pasca." ◆

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Trucks at Porgera lined up and ready to go.
Credit: NPL

Porgera production set to ramp up

Operator Barrick Niugini (BNL) reopened the Porgera gold mine under a new ownership structure at the end of 2023. Mark Bristow, CEO of Barrick Gold, talks to *Business Advantage PNG* about the deal he made to restart the mine, and the keys to returning it to full production.

By Nadav Shemer Shlezinger

The recently reopened Porgera gold mine will be a "world-class" operation for a long time, providing its stakeholders uphold their end of the bargain, says Barrick Gold Chief Executive, Mark Bristow.

As Barrick's global head, Bristow was instrumental in the deal between Barrick Niugini Limited (BNL, a 50/50 joint venture of Canada-headquartered Barrick and China's Zijin Mining) and the PNG government to form New Porgera Limited (NPL) and secure a new special mining lease (SML) in October 2023.

Porgera was put on care and maintenance in April 2020, following stalled negotiations over an SML. The 2023 deal saw BNL agree to reduce its interest in the mine, with PNG stakeholders, including Kumul Minerals Holdings, the Enga provincial government and local landowners, securing a majority interest between them.

Open pit mining resumed at Porgera in December 2023, and first underground ore was brought to surface in January 2024. The next major milestone came in April 2024, when 75 MW of power from the Hides gas-fired plant was restored, enabling a restart of the milling circuit and shipment of first gold.

> THE MORE WE CAN WORK WITH LOCAL BUSINESSES AND LOCAL PROFESSIONALS, THE MORE WE'LL ALL BE ABLE TO SUPPORT THE GOVERNMENT'S OBJECTIVE OF BUILDING A MIDDLE CLASS

Looking forward, Bristow says Porgera will ramp up production "all the way out to 2028, and possibly even longer."

"Guidance is for 200,000 to 250,000 ounces (oz) of gold in 2024, and will go up to nearly double that before steadying out. Then we'll add another 50 per cent," he explains.

"If we can get this all sorted out efficiently, the profile will change. Ultimately, it will be a world-class, 500,000 oz producer for a long time – if we can get it all right."

Law and order

Local factors pose a major challenge to the mine's success, in the Barrick CEO's opinion.

"It would be remiss of me not to point out that there are some serious challenges in the Porgera Valley," Bristow says.

"This is an asset that has 51 per cent Papua New Guinean ownership – government, landowners and Kumul – and they need to fulfill their side of the bargain. That is their responsibility."

"Our message, which I share with Prime Minister Hon. James Marape at every opportunity, is that we really need to focus on security, otherwise we are not going to get the benefits of the new partnership that we all committed to."

Porgera has more than 2,500 employees, and Bristow expects to recruit "between 500 and 700 more." Its workforce is made up of 57 per cent Enga Province residents, 40 per cent from other parts of PNG, and 3 per cent expatriates.

Message for landowners

The New Porgera agreement ensures PNG interests in the mine will collect 53 per cent of mine benefits after capital expenditure, with BNL receiving 47 per cent.

"Landowners get [a] 15 per cent carried [share], whereas everyone else participates in funding the capital," explains Bristow.

Looking back at Barrick's involvement in Porgera, which began in 2006, Bristow says it helped build "one of the biggest and most successful local companies", the iPi Group.

"I'm a big believer in locals. These are national assets: local business and local people should benefit from employment and contracts," Bristow says.

But he warned that anyone looking to get involved in Porgera in future would need to establish a presence in the community.

"We're not going to do business with people who land contracts with us, then leave the valley… and don't actually put anything back into the community," he says.

"Whether it's Papua New Guinea or the Democratic Republic of Congo or Nevada in the US, we always seek to encourage and support and invest in local service providers. We invest in building their capacity and growing them, because it's in our best interests."

Huge opportunity

Barrick is the world's second largest gold producer, operating 13 gold mines and three copper mines. Its projects and operations span 18 countries.

Although Porgera and PNG provide a "huge opportunity" for Barrick, they are only "a very small part" of its business at present, according to Bristow.

"As a global gold and copper miner, we are intrigued by the opportunity to grow our footprint in PNG, but it's subject to being able to deliver on our business objectives," he says.

"There's no doubt that Papua New Guinea has a lot of mineral endowments. But money needs a friendly environment, and sometimes that's not the case in PNG."

For PNG to truly benefit from this endowment, he says, its leaders must rid themselves of short-term thinking.

"The government has got to start learning to share that benefit with the greater population of Papua New Guinea, because it's a God-given endowment that really could transform that country into something really special," he says.

At the same time, he acknowledges that he must "keep my shareholders focused on the value and the long-term benefits of where we are taking Barrick – and be cautious about the instant gratification demands. By its very nature, mining is a capital-intensive, long-term business."

Bristow concludes by revealing that his team has also reached out and is building relationships with investors in PNG's gas projects.

"We have a big responsibility to work hard, to be an advocate for mining, and to prove to the people of PNG that we do bring enormous benefits to that country," he argues.

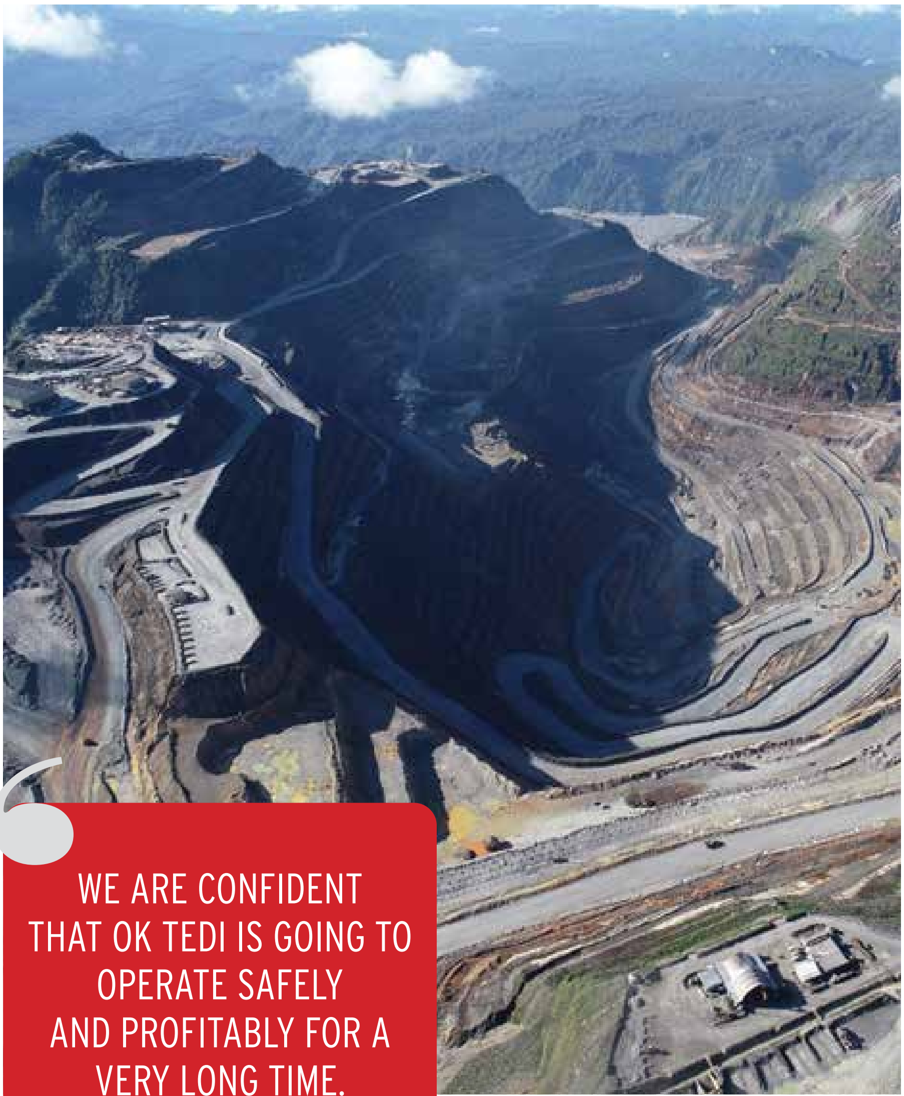
"The more we can work with local businesses and local professionals, the more we'll all be able to support the government's objective of building a middle class, which will without a doubt transform PNG." ◆

PORGERA IN A NUTSHELL

Mine type: Open pit & underground
Province: Enga
Annual production: 200,000 – 250,000 oz gold (2024 forecast)
Ownership: New Porgera Limited (51% PNG stakeholders, including Kumul Minerals Holdings, local landowners and the Enga provincial government; 49% Barrick Niugini Limited, a 50/50 JV between Barrick Gold and Zijin Mining).

Ok Tedi's 25-year plan

Kumul Minerals is planning a bright future for Ok Tedi, PNG's oldest and largest producing mine. Managing Director Sarimu Kanu shares the plans with *Business Advantage PNG*.



Aerial view of the Ok Tedi mine.
Credit: OTML

By Nadav Shemer Shlezinger

The Ok Tedi mine at Mount Fubilan in Western Province is PNG's longest-running mine, having produced more than 5.2 million tonnes of copper, 15.9 million ounces (oz) of gold and 36 million oz of silver since beginning commercial operations in 1984.

According to Managing Director Sarimu Kanu, it will remain the "cornerstone" of majority-owner Kumul Minerals Holdings Limited (KMHL) "and a platform for growth in PNG" for a long time to come.

State-owned KMHL owns 67 per cent of operator Ok Tedi Mining Limited (OTML), with three separate Western Province entities owning the remainder.

The mine was nationalised by the PNG government in 2013, one decade after Australia's BHP transferred its majority ownership to a specially created vehicle, PNG Sustainable Development Ltd, following major environmental damage to the Fly and Ok Tedi rivers caused by the mine.

Kanu is bullish about Ok Tedi's future, noting OTML's "turnaround" since the appointments of Kedi Ilimbit as Managing Director and Jeffrey Innes as Chairman in the first half of 2023. Since then, he says, OTML has embarked on a comprehensive operating improvement campaign to support its board's decision to extend the mine's life to 2050.

Refurbishment

At its heart of the campaign is an asset-renewal project aimed at "upgrading, replacing and refurbishing all the infrastructure, which has been there for a long time but has never [previously] been refurbished."

It also involves replacing the existing mine fleet, upgrading maintenance workshops and improving power reliability.

Lastly, there is a tailings optimisation study – something which will be of particular interest, given the mine's environmental history. (See page 47 for more on tailings.)

"The future of Ok Tedi will not always be a riverine tailings operation. We have started studies on terrestrial tailings placement," Kanu tells *Business Advantage PNG*.

> WE ARE CONFIDENT THAT OK TEDI IS GOING TO OPERATE SAFELY AND PROFITABLY FOR A VERY LONG TIME.

Beyond the mine

Kumul Minerals is also planning to assist OTML in economising nearby deposits.

"While we have the assets at Mt Fubilan [where Ok Tedi's open pit is located], we must take the opportunity to also create synergies around the prospectivity of those surrounding mountains. Where we can, we will economise other prospects by feeding into a main central processing facility," Kanu says.

"We are confident that Ok Tedi is going to operate safely and profitably for a very long time." ◆

OK TEDI IN A NUTSHELL

Mine type: Open pit
Province: Western
Annual production: 248,000 oz gold, 73,000 tonnes copper (2022)
Ownership: Kumul Minerals Holdings (67%), the people of Western Province (33%)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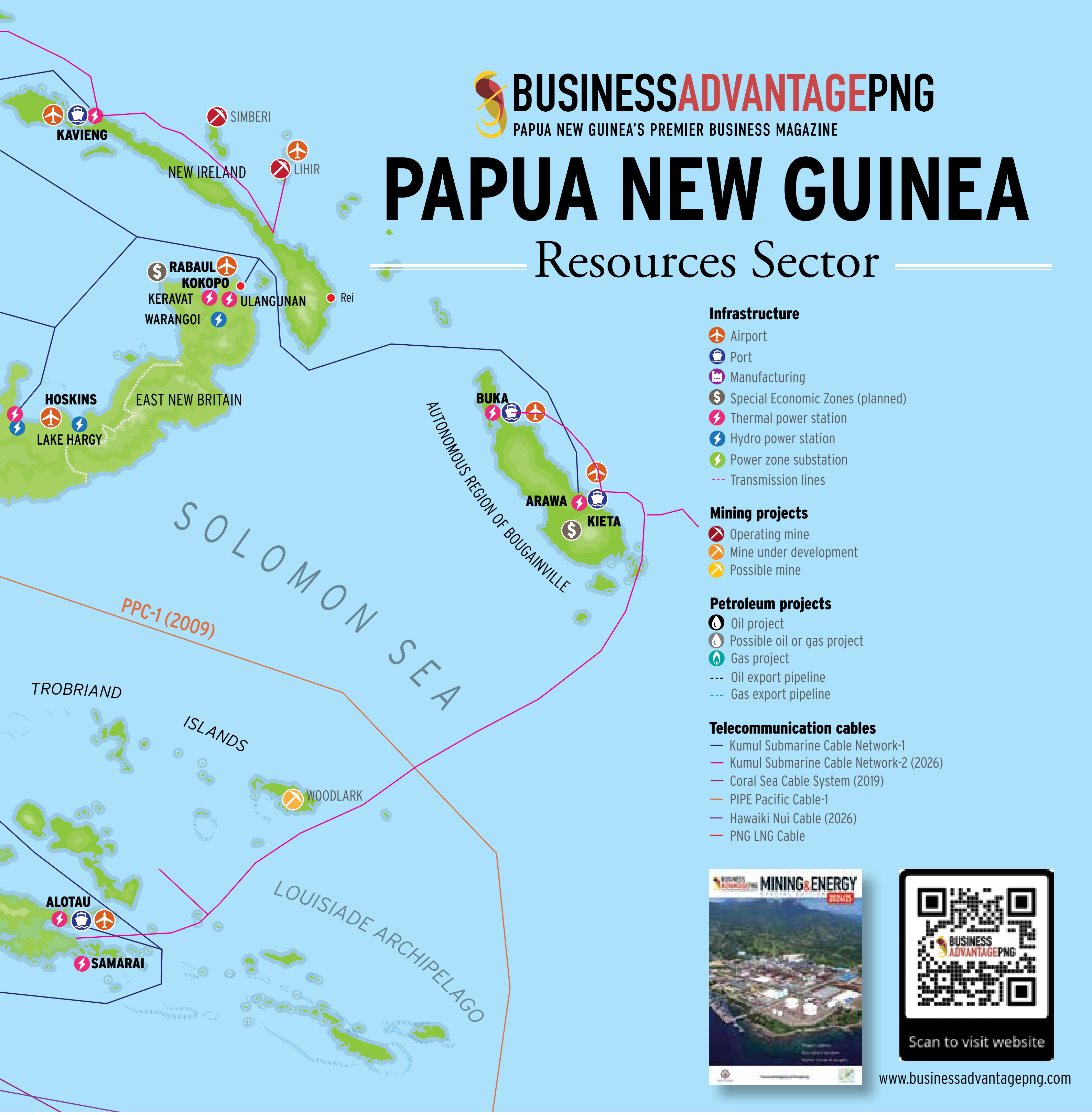
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LAKE HARGY
BUKA
AUTONOMOUS REGION OF BOUGAINVILLE
ARAWA
KIETA
SOLOMON SEA
PPC-1 (2009)
TROBRIAND
ISLANDS
WOODLARK
ALOTAU
SAMARAI
LOUISIADE ARCHIPELAGO
Infrastructure
Airport
Port
Manufacturing
Special Economic Zones (planned)
Thermal power station
Hydro power station
Power zone substation
Transmission lines
Mining projects
Operating mine
Mine under development
Possible mine
Petroleum projects
Oil project
Possible oil or gas project
Gas project
Oil export pipeline
Gas export pipeline
Telecommunication cables
Kumul Submarine Cable Network-1
Kumul Submarine Cable Network-2 (2026)
Coral Sea Cable System (2019)
PIPE Pacific Cable-1
Hawaiki Nui Cable (2026)
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The Lihir gold mine commenced production in 1997
Credit: Newmont Corporation

Newmont focusing on 'value over volume' at Lihir

Less than one year after assuming ownership of the Lihir mine, Newmont Corporation is pushing ahead with plans to maximise value. Newmont PNG's soon-to-depart Managing Director, Alwyn Pretorius, takes *Business Advantage PNG* inside the transition, and shares the plans for the island mine's future.

By Nadav Shemer Shlezinger

US-headquartered Newmont Corporation was already the world's largest gold producer before it completed its acquisition (reported at the time as worth US$16.8 billion) of Australia's Newcrest Mining in November 2023.

The acquisition added five operating mines to its portfolio, including Lihir, PNG's largest gold mine by annual production.

Newcrest had long stated its ambition for Lihir to produce one million ounces (Moz) of gold annually. But Alwyn Pretorius, on the eve of completing his one-year tenure as Managing Director of Newmont PNG, says Lihir's new owner is focused on "value over volume."

"We don't have any aspirations to produce 1 Moz. What we want is to extract maximum value from the ore body," he tells *Business Advantage PNG*.

Reaching full potential

Newmont introduced its Full Potential program at each of the mines it acquired from Newcrest on the day the acquisition was completed, with the aim of identifying and delivering operational efficiencies and creating greater value.

Pretorius says the management team at Lihir identified 25 Full Potential projects, aimed mostly at improving mining conditions, materials handling, processing and total cost of ownership.

"These are not quick solutions. Some will require capital investments and some will take time," he explains.

He also highlights two important growth projects. Phase 14A will apply steep-wall mining technologies such as long anchors and shotcrete to open up additional high-grade reserve ounces. Meanwhile, the Nearshore Soil Barrier (NSB) will make mining possible below sea level and enable Lihir to access high-grade ore in the Kapit ore body.

Phase 14A was initially proposed by Newcrest, with a 2023 feasibility study outlining US$296 million in capital expenditure on a nominal basis and a payback period of only 2.9 years. The project is now underway and "should be completed by 2026," according to Pretorius.

"Steepening up of that wall opens up reserve ounces at the base of the pit, so we can mine deeper and extract more of the ore body. This will result in a significant increase in grades over the next five years, from around 2 grams per tonne (g/t) to about 3 g/t," Pretorius says.

The Nearshore Soil Barrier was also proposed by Newcrest and is now the subject of a feasibility study under Newmont's ownership. Combined with the steeper pit slopes, the NSB aims to access 6–7 Moz of the current 17.5 Moz reserve, ensuring Lihir's 16-year life of mine.

If approved, it will see the

construction of "an 800 metre-long reinforced concrete wall averaging approximately 30 metres in depth that will basically move the shoreline and enable us to mine below the sea floor," Pretorius explains.

"It's a massive civil engineering project. We're still firming up the numbers. The aim is to start execution of the project around the end of 2025, and it will take up to about 2028 to complete."

Addressing Lihir's unique risks

Full Potential was one of three programs introduced by Newmont at its new mines, alongside its Fatality Risk Management and Respect at Work programs.

Newmont was able to replicate many processes at Lihir from its other operations around the world, and identified additional fatality risks that are unique to the PNG site.

One is geothermal risk from the geothermally active caldera on which the mine is situated; the other is the risk of drowning posed by the proximity to the sea.

"We're close to the ocean where we do a lot of work, mainly monitoring our deep-sea tailings placement," explains Pretorius.

The Respect at Work program was similarly tailored to the local context, where it was integrated with the 'Trupla Meri Trupla Man' program that had run at Lihir since 2018. Through the program, Lihir employees and contractors receive training about inclusive and respectful behaviours in the workplace and at home.

"It's a very good program in the PNG context, which has high levels of domestic violence," Pretorius says.

"We've created an environment where people feel free to speak up, and where we can also provide assistance and support in cases where it's needed." ◆

LIHIR IN A NUTSHELL

Mine type: Open pit
Province: New Ireland
Annual production: 625,649 oz gold (2023)
Ownership: Newmont Corporation (100%)

Drill and Blast Superintendent Gelam Iamo has been working at Lihir since he entered its graduate program over 14 years ago. Since then, he has worked as a planning engineer, drill and blast coordinator, and production coordinator, and also worked in the mine's Business Improvement team. Iamo also fills as Mine Production Superintendent and Mine Manager when required.

Credit: Newmont Corporation

BUILDING LOCAL CAPACITY

According to Newmont's Alwyn Pretorius, encouraging local content and skills are essential not only for Lihir, but for the long-term success of PNG's mining sector as a whole.

While Newmont is new to PNG, Alwyn Pretorius says its approach to local engagement is similar to its operations in West Africa and South America.

"Anywhere we operate, we try to maximise benefit to all stakeholders," he says.

"At Lihir, there are a number of contracting companies owned predominantly by local landowners. There is a large workforce at site, with more contractors than employees. Most of those contract companies are locally owned."

While acknowledging PNG's long mining history, he also notes that a shortage of critical skills "poses a challenge".

"There's huge opportunity in PNG for the mining industry. But skills, and retention of skills, are going to be a challenge in future," he says.

In an effort to address this problem, Newmont has revived an apprenticeship program that previously operated at the Lihir mine until 2019. The first intake has 59 students, with plans for similar numbers next year. The four-year program will focus on electro-mechanical, mechanical fitting and machining, and heavy equipment fitting.

Ultimately, it is the PNG mining industry's responsibility to develop critical skills, in Pretorius' view. Skills retention is also high on the agenda.

"A lot of those skills and capabilities are mobile. We don't only compete for skills within the PNG mining industry – a lot of those with critical skills are also attracted to Australian mines," he observes.

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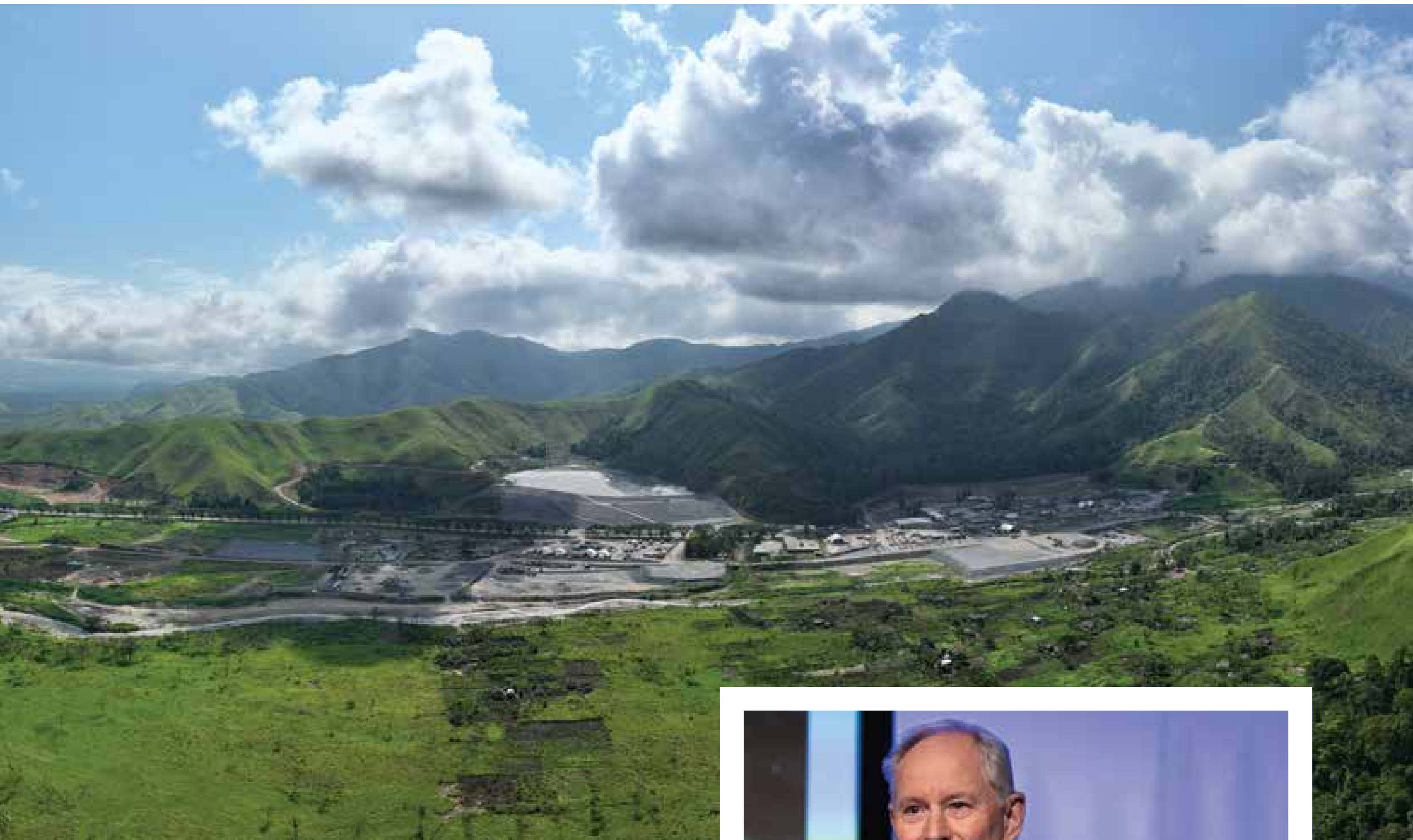
Kainantu set to quadruple production by 2027



The Kainantu gold mine has been in continuous expansion since its acquisition by Canada's K92 Mining in 2015. Chief Executive John Lewins shares his company's aspiration to become the PNG's mining sector's largest taxpayer – and the investment underpinning it.

By Nadav Shemer Shlezinger

While some of PNG's major resources projects are still forthcoming, one capital-intensive project is already in full swing: the expansion of the Kainantu gold mine in Eastern Highlands Province.

Canadian operator K92 Mining has spent or committed 57 per cent (at time of writing) of the US$320 million earmarked for its stage 3 and 4 expansions, which are expected to quadruple current gold, copper and silver production to 470,000 ounces (oz) per year of gold-equivalent by 2027.

When K92 acquired Kainantu from Barrick Gold in 2015, the operation had been on care and maintenance for six years and had never achieved commercial production. But it had

Top: The Kainantu gold mine.
Credit: K92 Mining
Above: K92 Mining's John Lewins.
Credit: BAI/Stefan Daniljchenko

> WE'VE REINVESTED IN OUR BUSINESS, AND WE'LL CONTINUE TO REINVEST.

all the ingredients necessary to become a successful mine, according to K92's CEO, John Lewins.

"We've got great infrastructure," he tells *Business Advantage PNG*. "We're right next to the sealed road. We've got grid power from the Yonki dam [that supports the Ramu 1 hydroelectric power plant], so it's also green power. We've got an airstrip right next to us. And we're in the Markham Valley, so we have all the real estate we require to build our assets."

Expanding through cashflow

K92 achieved commercial production in January 2018, with the processing plant initially capable of handling 200,000 tonnes per annum (tpa) of ore throughput – enabling production equivalent to 50,000 oz of gold per annum.

The company quickly embarked on its stage 2 and stage 2A expansions, which took the mine to 600,000 tpa by May 2023.

Commissioning of the stage 3 plant will begin in the second quarter of 2025 and will double the plant's capacity. Work will then begin on stage 4, with the aim of increasing capacity to 1.8 million tpa by the first half of 2027.

Lewins notes that K92 has funded these expansions almost entirely from generated cashflow.

"In 10 years, K92 shareholders have not seen a dividend, but they have seen significant capital growth," he says.

"We've reinvested in our business, and we'll continue to reinvest, and hopefully at some point or other we'll be paying dividends to our shareholders."

Aggressive exploration program

These expansions have been accompanied by an aggressive exploration program, most of it in the 830 square kilometres (km^2) of land surrounding the $15km^2$ mining lease area.

"We're the largest explorer in the country. We'll spend about US$25 million [on exploration] this year, which I believe is the equivalent of the rest of the industry put together," Lewins says.

Kainantu currently has a 7.6 million oz gold-equivalent resource, thanks largely to the 2017 discovery of the Kora North deposit – which won the prize for best international discovery at PDAC, the world's largest annual mining convention, in 2021.

"We've significantly grown that resource we inherited. It's about the fifth-highest grade resource of over six million ounces in the world. It's testament to the endowment of PNG in the mineral space," Lewins says.

The current focus is on the adjacent Arakompa deposit, where K92 has four drilling rigs deployed. Lewins believes it has the potential to add another multi-million ounce resource, which could be brought into production in time for the plant's expansion in 2027-28 and extend Kainantu's mine life beyond 2038.

In total, K92 has 11 drill rigs deployed across its tenements.

"People talk about the cost of exploration in PNG – and it is expensive. We've got helicopters to get us on top of mountains. But our discovery cost is about US$7.50/oz. The world average is about US$50/oz, so targeted exploration can deliver an economic return." ◆

Female graduate officers at Kainantu.
Credit: K92 Mining

CONTRIBUTING TO PNG'S GROWTH

Through all K92 Mining's achievements at Kainantu over the past decade, one of the things CEO John Lewins is most proud of is its contribution to PNG and the local community.
The Kainantu workforce has grown from 130 when K92 Mining acquired the operation to over 1,800 today – comprising of 94 per cent Papua New Guineans – and it plans to increase this to 2,500 people by the year 2026. In 2023, 56 per cent of its total procurement spend was with PNG companies.

This commitment has included substantial investments in local training and skills development, including university scholarships.

Lewins sees K92's success as PNG's success too, noting that his company was the second-highest corporate taxpayer in the country's mining sector each year from 2021 to 2023.

"We think we can take the guernsey for the top taxpayer by 2026," he says. "It's an important point for a corporate entity in a country like PNG: come in, be profitable, pay tax, be proud."

KAINANTU IN A NUTSHELL

Mine type: Underground
Province: Eastern Highlands
Annual production: 100,533 oz gold, 3,488 tonnes copper, 160,628 oz silver (2023)
Ownership: K92 Mining

Expansion on cards for PNG's only nickel-cobalt mine

Above: Nickel 28's Craig Lennon
Left: Ore from the Ramu mine is pumped via a 135 km slurry pipeline to the Basamuk refinery, 55 km south-east of Madang town.
Credit: MCC

A planned expansion of PNG's only nickel-cobalt mine is "still definitely on the cards", according to Craig Lennon, Head of Asia-Pacific for the mine's joint-venture partner, Nickel 28.

By Nadav Shemer Shlezinger

Manager of the Ramu nickel-cobalt mine in PNG's Madang province, Ramu NiCo Management, is considering an extension to its special mining lease (SML), which could cost up to US$1 billion (K3.9 billion) and double annual production.

Additionally, its parent company, Metallurgical Corporation of China (MCC) is conducting a study with Kumul Minerals Holdings on collaboration in downstream processing which it expects to complete by the end of 2024.

Nickel 28 holds an 8.56 per cent interest in the Ramu Nickel Joint Venture (JV), alongside majority owner MCC (85 per cent) and PNG's Mineral Resources Development Company (MRDC, 6.44 per cent).

The JV partners are about to commence an update to the 2018 technical study to determine whether to expand within the current SML area or incorporate surrounding exploration rights into the mining area.

"Expansion can mean different things," Craig Lennon, Head of Asia-Pacific for Nickel 28, tells *Business Advantage PNG*. "It could be that we expand production within the current footprint, or that we expand outside of that.

"If you go outside of that footprint, then that means you have to go through certain regulatory and permitting processes," he says, noting that it could impact current agreements with third parties while also bringing in new parties.

"PNG has a history of permitting projects, which is great. But not too many projects have tried to do an expansion outside of their footprint."

Above nameplate capacity

Ramu commenced production in 2012 and has been running above its nameplate capacity of 32,600 tonnes of nickel for at least the last seven years, according to Lennon.

In 2023, it produced 33,604 tonnes of nickel and 3,072 tonnes of cobalt contained in mixed hydroxide precipitate. To put this in perspective, Ramu produces just under 1 per cent of the world's nickel and around 1.3 per cent of its cobalt.

Nickel prices globally are typically volatile, presenting a particular challenge.

"Our production is something we can control – and it is very consistent," Lennon says. Ensuring a tight control of costs is also another imperative – the mine is currently undergoing an efficiency program to ensure production levels are maintained.

"The engine's [over] 10 years old. We're going to go through some maintenance this year. There are a few 'debottlenecks' to do, which we hope will get our production to 35,000 tonnes [of nickel] on an annual basis going forward," he says.

Long mine life

Ramu currently has a measured and indicated resource of 150 million tonnes at average grades of 0.85 per cent nickel and 0.1 per cent cobalt in an area covering just 15 per cent of its total exploration licence.

This will be enough for "decades" of additional mine life, with "plenty" in the surrounding licence areas as well, says Lennon.

Exploration activity has been "huge" this year compared to the previous year, with thousands of metres drilled.

"We're going to increase that slightly in the next year," he adds. ◆

RAMU IN A NUTSHELL

Mine type: Open pit
Province: Madang
Annual production: 33,604 tonnes nickel; 3,072 tonnes cobalt (2023)
Ownership: MCC (85%), Nickel 28 (8.56%), MRDC (6.44%)

COMPETITIVE PRESSURES IN NICKEL

The last year has been challenging for nickel producers around the world, with a massive increase in production from Indonesia significantly impacting prices.

PNG's proximity to Indonesia (the world's largest producer) and New Caledonia (third-largest), is not lost on Nickel 28's Craig Lennon.

"Why is it that Indonesia gets [an average grade of] 1.8 per cent nickel and New Caledonia gets 1.8 per cent, when PNG only gets one per cent?"

Workers at Ramu NiCo's Basamuk Refinery.
Credit: MCC

"They're doing it by saying they will build industrial parks for you if you come and build your operation there," he explains.

The biggest challenge for PNG policymakers, in Lennon's opinion, is to balance nationalistic views about attaining more from of its resources – which he says "they're entitled to do" – with policies that will encourage foreign investment.

But while PNG's nickel resources might look small compared to those of its neighbours, Lennon argues that they are still substantial enough to generate opportunities – with the right regulatory environment.

"PNG has to compete with the rest of the world for capital, whether they like it or not; and that capital can move quite easily, especially when you've got aggressive countries like Indonesia and the Philippines," he says.

Attractive policies

Lennon says these two countries have changed policies to attract investors.

"Without my Ramu hat on, if I've got a dollar to spend, am I coming here? Are you doing enough to encourage me to come here or do I look somewhere else? Having worked in PNG for 20 years, I'm a big supporter of the country. I think it's a great place to work. But you've got [to have] a two-way street."

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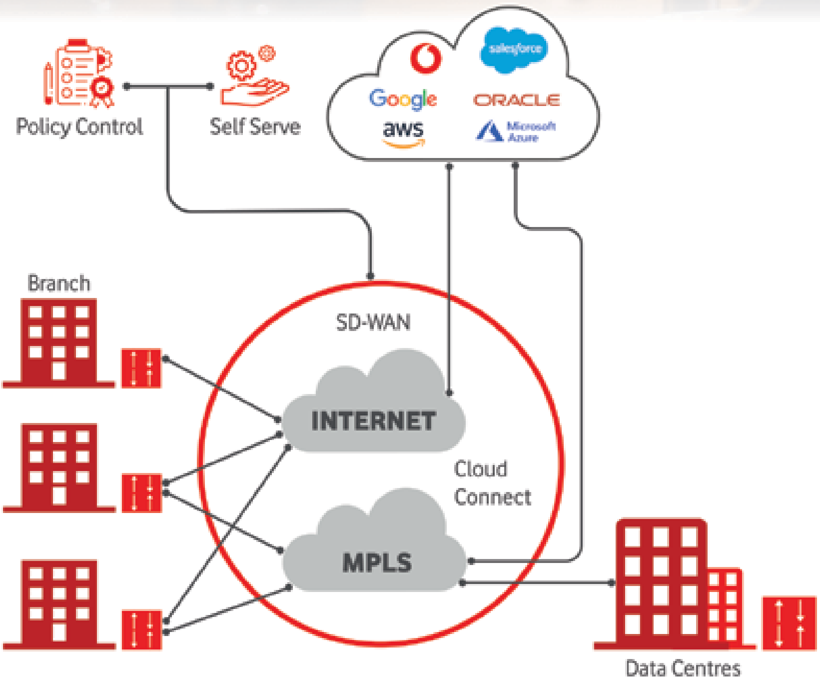

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Wafi-Golpu partners committed to project

The Wafi site in Morobe Province.
Credit: Newmont Corporation

As PNG's state negotiating team and the proponents of the Wafi-Golpu joint venture hammer out the details of a mine development contract, leaders on all sides affirm their commitment to develop the US$5.4 billion copper-gold project.

By Nadav Shemer Shlezinger

Wafi-Golpu is one of the world's largest undeveloped copper-gold block-cave projects, boasting 5.1 million ounces of gold and 5.1 million pounds of copper in probable reserves, according to a February 2024 update from Newmont Corporation.

The project, in Morobe Province, is owned by a 50/50 unincorporated joint venture between US-headquartered Newmont and South Africa's Harmony Gold Mining Company. Under PNG law, the state may acquire up to a 30 per cent participating interest in Wafi-Golpu, with 20 per cent expected to be held by state nominee Kumul Mineral Holdings (KMHL) and 10 per cent by the Morobe provincial government and local landowners.

Sarimu Kanu, KMHL's Managing Director, tells *Business Advantage PNG* the state will exercise its full 30 per cent in the project. He says the mine development contract (MDC) is "the sticking point right now," but, at the time of writing, believed both the contract and its special mining lease (SML) were imminent.

Alwyn Pretorius, Newmont PNG's Country Manager, also sees the MDC as "the key milestone", but adds that "it is very hard" to draw a timeline.

"What I can say is that we are very keen to progress the project and we remain committed to transparent and good faith engagement with the government and other key stakeholders in this process," he tells *Business Advantage PNG*.

Sticking points

Negotiations over Wafi-Golpu stretch back to December 2018, when Newcrest Mining (which was acquired by Newmont in 2023) and Harmony Gold signed a memorandum of understanding with the PNG state to progress the project "as quickly as practicable."

> WE ARE MOVING TOWARDS AN AGREEMENT THAT WILL BE ACCEPTABLE TO EVERYONE.

The main sticking points in the current negotiations are around the legal structure of the joint venture and financing, according to Kanu.

"How does the structure not disadvantage Kumul's ability to go out and look for money? How does it impact on taxation?" he says.

"We are moving towards an agreement that will be acceptable to everyone," Kanu says, adding his belief that an MDC and SML are achievable before the end of 2024.

Regarding the SML, Kanu says this could be confirmed soon after the MDC is completed.

"If you look back to the negotiations over Porgera, we had the MDC and SML done on the same day."

Development timeline

Kanu estimates a final investment decision (FID) can be reached 30 months from approval of the MDC and SML, meaning development of Wafi-Golpu could begin by the first half of 2027.

"As we knock off each stage of the engineering studies, we will engage with financiers, and hopefully by FID we will be pushing [towards a] financing arrangement."

Development timelines will also need to be agreed to by Newmont and Harmony.

Tom Palmer, Chief Executive of Newmont, tells *Business Advantage PNG* that Wafi-Golpu is "a fantastic resource" that "will be developed".

But, he cautions, "it's got to compete for capital with a number of other projects in our portfolio."

Moreover, adds Alwyn Pretorius, the project's 2018 feasibility study needs to be updated, and "a number of other things need to be worked on before we can start with construction."

One thing that is certain is the appetite for the project among businesses in Wafi-Golpu's host province, Morobe.

"We need it; the country needs it," says the President of the Lae Chamber of Commerce and industry, John Byrne, who sees the project providing a significant stimulus to local employment, services and infrastructure. ◆

BULLISH ON COPPER

One subject all parties involved with the Wafi-Golpu project are very much in agreement on is copper's potential to transform PNG.

Analysts have warned for some time of a looming copper supply deficit, with global consultancy McKinsey projecting that output will fall 6.5 million tonnes short of demand by 2031.

Kumul Minerals' Managing Director Sarimu Kanu says the state-owned miner is focusing strategically on copper-gold porphyry projects, and confirms its intention to exercise its equity rights on other large porphyry projects slated for development in the long-term, such as Frieda River and Yandera.

"These porphyry-type deposits are strategic for Kumul Minerals. We want to see the relevancy of the minerals to future technological developments, specifically in green energy."

Newmont CEO Tom Palmer.
Credit: Melbourne Mining Club

Likewise, while Newmont's acquisition of Newcrest strengthened its position as the world's largest gold producer, the transaction also added 14.5 billion pounds of copper reserves to its portfolio – 35 per cent of it at Wafi-Golpu.

CEO Tom Palmer says the potential to increase its exposure to copper "was a fundamental premise" behind Newmont's approach to Newcrest.

He points out that, while initial demand projections for copper were driven largely by global energy transition and widespread electrification, new drivers are rapidly emerging: artificial intelligence (AI) and data centres.

"[It's been] quite remarkable to look back over the last couple of years and to see that move in AI. We didn't see two years ago that it would put further demand on copper," Palmer tells *Business Advantage PNG*.

"Our project pipeline is all copper. What we're going to bring on in copper will then start to complement the gold we're producing, [which] will further strengthen our business."

Above: The Frieda River project airstrip.
Left: A project overview.
Credit: PanAust

PanAust plays long game on Frieda River

The US$7 billion Frieda River copper-gold project is one of the largest in PNG's development pipeline but may take another decade to come into production. We look into why its developer, PanAust, considers it worth the wait.

By Nadav Shemer Shlezinger

PanAust's projected Frieda River mine – located in Sandaun Province, right on the border of East Sepik – is actually just one of four integrated projects proposed in its 2018 updated feasibility study.

These are:

- The copper-gold mine project itself – a conventional open-pit mine with a projected capital cost of US$2.8 billion;
- a 490MW hydroelectric project, which will double as a tailings storage facility, at a capital cost of US$3.2 billion;
- a power grid project, with around 400km of transmission lines running southeast to Hides (in Western province) via Telefomin and north-west to Vanimo and beyond, costing US$418 million; and
- enabling infrastructure, including airport and port upgrades, construction or upgrades of around 300km of roads, and a 300km pipeline to feed concentrate to Vanimo for shipment to Asian export markets, all of which carries a price tag of around US$739 million.

Long timeline

PanAust, Australian subsidiary of China's state-owned Guangdong Rising Holding Group, is hoping to have its environmental impact statement approved by the end of this year, followed by a special mining lease (SML) in 2026.

If everything goes to schedule, according to PanAust's Project Director Frieda River, Phil McCormack, it will complete detailed design and engineering by 2028, and start construction in 2029, with ore production commencing in 2035.

McCormack is excited about the benefits the Frieda River copper-gold project will bring to PNG's Sepik region. However, he tells *Business Advantage PNG* that the country can only absorb a certain number of resources projects at any one time.

"We're cognisant of the fact that you cannot have all these major projects – Papua LNG, P'nyang, Pasca A and Wafi [Golpu] – kick off at the same time. Otherwise, you'd have hyperinflation in PNG. People wouldn't be able to afford housing. You'd have to import workers into PNG," McCormack says.

"The idea that we have is we're working behind Wafi. Their SML is likely to be approved this year. Then there's a three- to four-year construction cycle, and that fits well with our timing," McCormack continues.

"That way you will see a skilled workforce being developed in PNG. They'll come off the gas projects and go onto the Wafi project, then they'll come onto the Frieda project. That way, you'll see sustained growth."

Gamechanger for Sepik

At full production, Frieda River is expected to produce 175,000 tonnes of copper per year – which would make it PNG's largest copper mine – and 230,000 ounces of gold.

A project of that size requires massive supporting infrastructure to bring in all the equipment it needs and ship out the metal it produces, McCormack notes.

"PNG doesn't [currently] have the capacity for that. That's why we're marketing this as an infrastructure project supported by a mine."

Once the project is developed, PanAust sees it unlocking the economic potential of the Sepik region.

"The northern part of PNG has been infrastructure-

ENGAGING THE COMMUNITY

Localising the benefits of a project like Frieda River is a key part of PanAust's strategy.

"I'm the only expat currently working on the project. All of our other 48 staff are Papua New Guineans," notes PanAust's Phil McCormack.

One of these colleagues, Country Manager Joel Hamago, is in charge of PanAust's community and stakeholder engagement in PNG. The company has spent US$1.6 million from 2017-22 alone on infrastructure, diversity and healthcare projects.

"We're talking about a project that's stranded in resource terms, and also very isolated, and the only way to get there is by helicopter," Hamago says.

"Frieda River's logistical support has overcome these barriers. We are helping alleviate poverty and improve health outcomes by providing access to services and organisations such as Interplast."

Another focus has been on education – and in particular women's education.

"When I first started at Frieda, women had almost no access to education and could only speak their tok ples [local language]." Hamago says. "We're seeing more girls going to school now than ever before."

Community engagement at Ambunti Station.
Credit: PanAust

challenged for years," McCormack says, noting that most capital spending has taken place in the Highlands and Southern Regions.

"Along with Wafi, we'll take that capital from the south and move it further north and we'll start seeing the Momase [Morobe, Madang, Sepik] Region also develop."

PanAust acquired an 80 per cent interest in Frieda River from Glencore (which had acquired it in its merger with Xstrata) for US$75 million in 2014, and the remaining 20 per cent from Cobalt 27 (now Nickel 28), after Cobalt 27's 2019 takeover of Highlands Pacific in 2019. The company has operated the Phu Kham copper-gold operation in Laos since 2005.

Looking back on his six years in the role, McCormack admits that it has been as challenging as it has been rewarding. But, he adds, "We're in it for long haul with PNG and hence why we've been there for 10 years and why we continue to invest every year." ◆

Expansions for Simberi and Hidden Valley

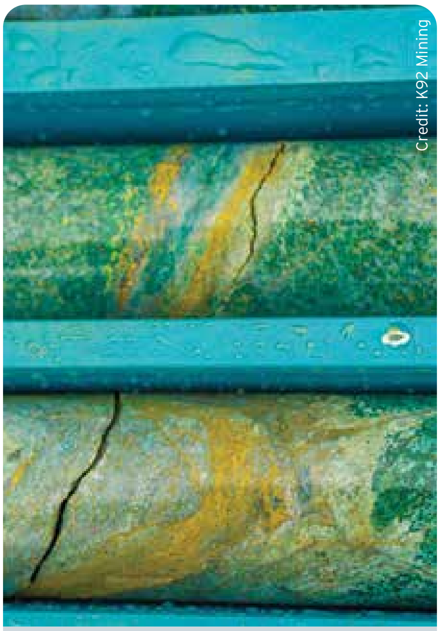
The operators of the Simberi and Hidden Valley gold mines are both planning expansions to extend mine life beyond the 2020s.

Operator St Barbara's recent strategic review of its Simberi gold mine provided confidence that oxide life can be extended through to 2026. It also confirmed the potential to extend the mine life by at least 10 years by processing ore from sulphide mineralisation contained below its oxide pits.

Simberi is an open pit mine on the northernmost island in the Tabar group of islands in New Ireland Province. It has been producing gold from oxide ores since 2008.

According to St Barbara, key near-term steps to progress expansion include an update to the mine's mineral resource and ore reserves estimate, an update to the feasibility study, completion of work specified by PNG's Conservation & Environmental Protection Authority, and an exploration drilling program in 2024/25.

With a viable development pathway for Simberi identified, St Barbara says it can now engage with the PNG government, the New Ireland Provincial government and local landowners on renewal of the mining lease, due in December 2028.



Credit: K92 Mining

SIMBERI IN A NUTSHELL

Mine type: Open pit
Province: New Ireland
Annual production: 64,791 oz gold (2023)
Ownership: St Barbara

HIDDEN VALLEY IN A NUTSHELL

Mine type: Open pit
Province: Morobe
Annual production: 173,548 oz gold, 3,397,313 oz silver (2023)
Ownership: Harmony Gold

Meanwhile, back on PNG's mainland, a project expected to extend the life of the Hidden Valley gold mine is "progressing well", according to a recent statement from operator, South Africa's Harmony Gold.

The open-pit gold and silver mine in Morobe Province has been in production since 2010 and its mining lease is due to end in 2030. In 2023, additional work on mine life added a further 200,000 ounces (oz) of gold to its reserves and studies are underway to convert another 2.4 million oz gold resources to reserves.

Meanwhile, Harmony has budgeted K20 million on exploration at Kerimenge, 7km from Hidden Valley, and pre-feasibility drilling and metallurgical tests are under way.

Harmony is also a joint venture partner in the Wafi-Golpu copper-gold project (see page 42). Like venture partner Newmont Corporation, Harmony is also growing its exposure to copper.

"The Tier 1 Wafi-Golpu project in PNG and Eva Copper in Australia give Harmony a sizeable copper-gold footprint, which will be transformational," CEO Peter Steenkamp told investors in 2024. ◆

PNG's unique tailings opportunity

As miners produce more metal ore to meet the growing demands of the global economy, they must consider how to store increasing amounts of mine waste rock and tailings.

By Nadav Shemer Shlezinger

PNG poses a unique set of challenges when creating tailings storage facilities, according to Ian de Bruyn and Claude Prinsloo, principal geotechnical engineers with extensive experience in PNG at SRK Consulting.

One is the topography, because PNG has "relatively young deposits, geologically speaking, that are deeply weathered by the severe tropical environment," De Bruyn tells *Business Advantage PNG*. That means potential for landslips.

"You have to be cognisant of creating the design you need whilst limiting the impact on the steep hillsides, because the more you need to excavate into the hillside, the more you create man-made slopes that present greater risk and potentially require onerous management and monitoring," he says.

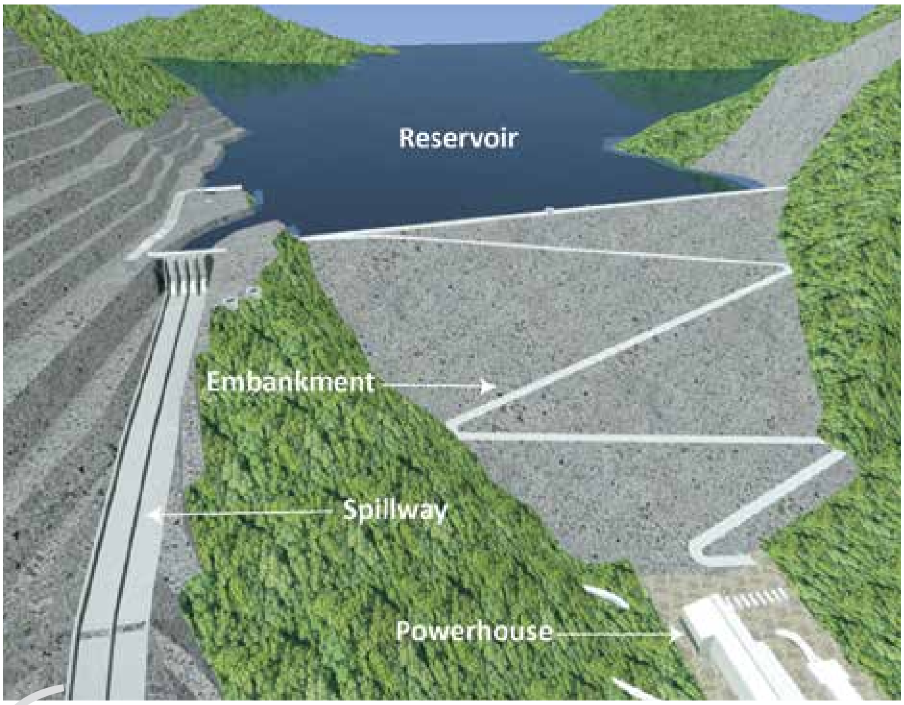
Meanwhile, the frequency and magnitude of earthquakes in PNG, as well as the high rainfall, add further layers of complexity, says De Bruyn.

PNG solutions

These characteristics have led almost all PNG's mine operators to opt for unique tailings storage solutions.

Only 18 of the approximately 2,500 industrial-sized mines operating around the world in 2014 deployed riverine or marine – rather than land-based – tailings disposal, according to a study by American environmental consultant, Craig Vogt.

Of the four mines using riverine disposal, three (Ok Tedi, Porgera and Tolukuma) are in PNG, and the fourth is Grasberg in Indonesia's Central Papua. Of the 14 mines using deep-sea tailings disposal, four (Lihir, Ramu, Simberi and Hidden Valley) are in PNG – made possible by the fact that PNG is one of the few places in the world with waters at 1,000 metres depth or greater within 2km of the coast.



Frieda River's integrated hydro power and tailings facility could be a world-first for PNG.
Credit: PanAust

> IT'S A BIG MINE, SO IT NEEDS A LOT OF POWER, AND THIS FACILITY SOLVES THAT PROBLEM

Industry-leading model

PanAust's Frieda River project is planning for land-based tailings storage, but this will be integrated with a more-conventional hydroelectric dam that, Prinsloo says, will be an industry-leading model for mine tailings management and renewable power generation (see page 44).

SRK produced a 2018 study which devised a design ideal for the project's unique setting in the northern foothills of PNG's Highlands.

Its US$3.2 billion design solution features a 190.5 metre-high main embankment, one diversion dam, two cofferdams, two diversion tunnels, a hydropower intake and conveyance system linked to a turbine facility, and a side-hill spillway.

De Bruyn says the design uses the area's heavy rainfall (averaging around 8 metres per year) and topography to its advantage.

"There is the ideal opportunity – especially with such a high embankment – for it to be a hydroelectric power generation facility," he says.

"The sheer volume of water that comes into the system is beneficial, because it's going to keep your dam topped up, keeping the tailings and mine waste rock submerged below water. But you've got to manage the storm events coming through. With hydropower, most of the water has a benefit to you because you're releasing and at the same time generating power for renewable energy."

Prinsloo adds that the 490 MW in generation capacity helps address the project's distance from existing grid infrastructure, while generating an excess that could potentially be shared with other users.

"It's a big mine, producing a large volume of tailings and mine waste rock, which needs a lot of power, and this facility solves that problem," he says. ◆

Juniors look to lead exploration turnaround

Spending on mineral exploration in PNG has plummeted in the past five years, according to the country's Mineral Resources Authority. But juniors such as Canterbury Resources and Adyton Resources believe they have found the way forward.

By Nadav Shemer Shlezinger

If exploration is the lifeblood of the mining industry, as is often said, then Papua New Guinea must find a way to encourage more of it.

Mineral exploration spending in PNG averaged K380 million between 2010 and 2019, peaking at K606 million in 2013. But it has plummeted since, averaging just K138 million between 2020 and 2022, and with no signs yet of the recovery seen globally, according to Jerry Garry, Managing Director of the Mineral Resources Authority (MRA).

Speaking at a July 2024 industry conference, Garry acknowledged that negative perceptions about law and order, a lack of geoscientific data, and long turnaround times for licences had all contributed to the decline in spend.

The MRA plans to implement a five-year program to boost exploration, which would include providing access to high-quality geoscientific data and testing new potential geological areas.

Sharing the cost

Another reason for PNG's low exploration is its high cost, according to Grant Craighead, Managing Director of Canterbury Resources.

The Australian-listed junior has three gold and copper exploration projects in PNG – Ekuti Range and Wamum in Morobe province and Bismarck on Manus Island – as well as projects in Queensland.

"The geographical challenges are the greatest difference between Australia and Papua New Guinea. In Queensland, there's road, rail, power, water, people, equipment – all within an hour's drive from our deposit," Craighead tells *Business Advantage PNG*.

"In PNG, you've got zero of those opportunities, which is why everything is three times as costly and three times as slow to achieve. And [therefore], the scale of the deposit you've got to find is three times as big."

This is why there are farm-in joint venture agreements at each of Canterbury's PNG projects. Rio Tinto, the world's third-largest mining company by market capitalisation, can earn up to an 80 per cent ownership interest in Bismarck by financing exploration activities, while Syndicate Minerals, a privately owned Australian company, can earn up to a 70 per cent interest in the two Morobe projects.

"Our joint venture partners cover basically 99 per cent of our exploration costs,'" Craighead explains. "As a junior, you virtually can't afford to operate in PNG unless you use other people's money."

Nevertheless, with costs proving such a stumbling block, Craighead says juniors are able to bring more flexibility than majors.

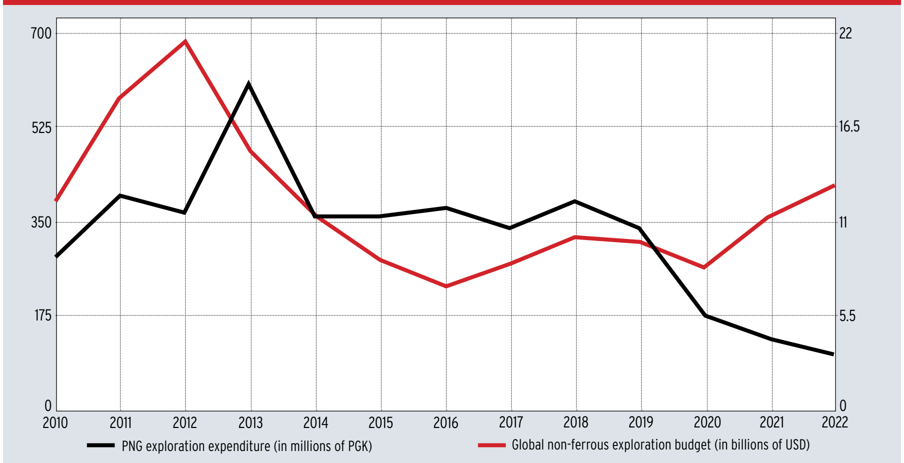
"As a big company, Rio Tinto struggles to operate on the ground in PNG," Craighead observes. "Whereas Canterbury, a junior staffed almost entirely with local people, has a lot more flexibility, a lot more on-the-ground skills, and is able to work in the operating environment a lot more effectively."

Islands over Highlands

Adyton Resources, a Toronto-listed junior, has the Fergusson Island gold projects in Milne Bay Province, comprising two advanced-exploration projects, as well as the prospective Feni gold project in New Ireland Province.

In May 2024, it signed a binding agreement with East Vision International Holdings (EVIH), a Singapore-based subsidiary of a Chinese ferro-titanium mining group, which gave EVIH the right to acquire up to

PNG'S EXPLORATION SPEND VS GLOBAL SPEND, 2010 - 2022



PNG's exploration spend has continued to lag in recent years as global exploration spending has recovered.

Sources: MRA; S&P Global Market Intelligence

Canterbury Resources' exploration program at Bismarck on Manus Island is supported by multinational Rio Tinto.

Credit: Canterbury Resources

a 50 per cent interest in the Fergusson Island project through US$8.5 million in project funding and an additional US$1 million payment to Adyton.

Adyton very deliberately chose PNG's islands over the Highlands, Managing Director Tim Crossley tells *Business Advantage PNG*.

"It's not that we don't think the Highlands has incredible exploration potential. Porgera, Ok Tedi and Wafi-Golpu were all discovered there," Crossley acknowledges.

"But to explore in the Highlands is expensive. It's nearly always helicopter-supported. Further to that, if you develop a project in the Highlands, you've got to build roads that will have to traverse through many different villages and landowners to get to your destination."

The islands provide "a much easier development pathway," he says. "You land a barge on the beach with all your equipment, walk it off and start drilling.

"Further out, you've got a fantastic blueprint of development, with Lihir and Simberi on island locations." ◆

PNG'S EXPLORATION CHALLENGES

There is "no debate around the prospectivity of PNG," according to geoscientists Stephen Johnson and Carl D'Silva of SRK Consulting, one of the world's largest mining consultancies.

"Anyone that has worked in mineral or petroleum systems will agree that PNG is one of the most prospective parts of the planet, and it's also one of the most immature exploration terrains compared to its prospectivity," Johnson tells *Business Advantage PNG*.

While the rewards are "considerable," both men note that exploration has become "more difficult" in recent years.

They name law and order, as well as logistics, as two big challenges.

"To genuinely explore much of PNG, you need significant airtime in a helicopter," says Johnson.

"When you overlay that with the probabilities of success, it adds an element of genuine safety risk that has to be accounted for."

It also increases the cost of exploration, he notes.

"When you're in Australia, you might be looking at A$100 to A$300 (K270 to K810) per metre to drill a diamond hole. If you are in PNG with a helicopter-support program, you may be [spending] A$700 to A$1000."

Short-term thinking imposes an additional burden.

"When you pick up an exploration tenure in Australia, there's a one-in-2,000 chance it will become a discovery and move through to becoming a mine," D'Silva says.

"[In PNG], expectations need to be aligned to the probabilities of success and the timeframes associated with early-stage exploration. This remains a challenging concept to communicate effectively, particularly when there's so much money coming in from just a few high-profile mining operations."

Mayur's concrete plan for PNG's future

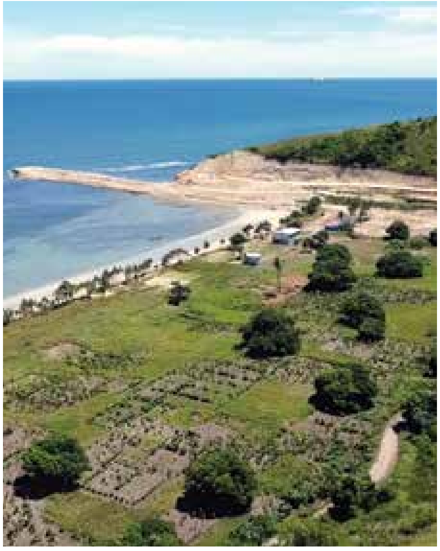
PNG ranks low for cement consumption. Mayur Resources is aiming to change all that with the development of its Central Cement and Lime project.

By Paul Chai

Mayur Resources' Central Cement and Lime Project (CCL) is set to feed the country's requirements currently met by imports from China and Japan.

"Cement is a nation-building product. Currently, you are paying over US$200 per tonne equivalent for a bag of cement out of the hardware stores in PNG. It's ridiculous and is not sustainable," says Mayur's Managing Director Paul Mulder.

"If you can provide cheaper, local, reliably manufactured and supplied building materials, that is going to be received extremely well," he says.



The site of Mayur Resources' cement project wharf in Central Province. Credit: Mayur Resources

Export potential

Mulder's vision for CCL – located 25 km northwest of Port Moresby in an area designated to become a Special Economic Zone – is for a fully integrated manufacturing facility that leverages low operating costs to deliver affordable building materials to the developing country.

Work has also begun on the construction of a wharf facility next to the project, which will enable Mayur to export its product to customers in Australia and the Pacific.

"Once you have satisfied all of the domestic needs of PNG, due to the proximity to the Pacific and southeast Asia, there's a great opportunity to export surplus production," he says.

Driving economic activity

Mayur's vision has attracted backing from big names. ACAM LP has committed up to US$50 million in funding, while Global Private Mining and Metals Fund has committed a further US$90 million to fund the project to a 'base-case' capacity of 400,000 tonnes per year of quicklime and a provision for additional expansion. These financing arrangements are pending achievement of final conditions, expected to be met in the coming months.

Mulder is also excited by the prospect of CCL becoming Asia-Pacific's first carbon-neutral quicklime, clinker and cement business due to carbon credits.

"By avoiding deforestation, the landowners and the government are set to get far more financial income from the development of carbon credits than they ever would from logging the forest," says Mulder. ◆

ON THE ROAD TO REOPEN TOLUKUMA

By reviving the dormant Tolukuma gold mine in PNG's Central Province, recently-listed junior Tolu Minerals is aiming to emulate another PNG mining success story.

By Nadav Shemer Shlezinger

Tolu Minerals is "shamelessly planning to emulate" K92 Mining's successful reopening of the Kainantu mine (see page 36) with its own bid to reopen the Tolukuma gold mine, according to Tolu Managing Director, Iain Macpherson.

"K92 have demonstrated what a junior can do to turn around what was basically an abandoned asset," Macpherson tells *Business Advantage PNG*.

Located just 100 kilometres north of Port Moresby, Tolukuma produced around 1 million ounces (Moz) of gold and 2.4 Moz of silver between 1995 and 2015, when it was put on care and maintenance.

Tolu acquired the mostly underground mine, and associated assets and infrastructure, in October 2022 and listed on the Australian Securities Exchange in 2024, raising A$17.3 million (K45 million), followed by an additional raising of A$8.8 million.

Addressing the economics

Tolu is aiming to restart production at 80,000 oz of gold per year, before expanding to 120,000 oz. Further growth will be on the back of exploration activities across the mining lease area.

For now, a top priority is completing a 70-kilometre road to allow access to the mine site from the Hiritano Highway.

"It [Tolukuma] stopped operating not because the resource was depleted, but because of key cost drivers, essentially driven by the [absent] road," Macpherson explains. "It put an unbearable burden on the economics of the project."

Power is another priority, with Tolu working on adding 1.3 megawatts by refurbishing the existing power station. Longer term, it is in talks to build a new hydro power station.

While Macpherson acknowledges the PNG government's 20-year Connect PNG roadbuilding program, he says Tolu can't afford to wait.

"I've built a number of remote mines. Our philosophy is: you wait for somebody to do the infrastructure at your peril," he says.

Renewable energy a growth opportunity

Global moves to encourage responsible investment in the face of climate change and other ESG factors are inevitably influencing what's happening on the ground in PNG.

By Andrew Wilkins

Geri McMahon, KPMG's global head for ESG (environment, sustainability and governance) in the asset management sector, speaks of "a wave of regulation on climate disclosure coming into effect all over the world," including in PNG's major trading partners.

This is inevitably driving financiers and investors to place new demands on projects seeking finance, she told the 2024 Business Advantage PNG Investment Conference.

Electric vehicles are now a carbon-friendly solution for corporate fleets in PNG.
Credit: Niugini Automotive

In PNG, carbon mitigation, capture and offsets are already baked into the design of future gas projects such as TotalEnergies' Papua LNG and Twinza's Pasca A. Meanwhile, other companies such as ExxonMobil, Newmont Corporation and Santos have global CO_2 reduction commitments that already influence how they operate in PNG.

One result is a significant increase in the use of solar and other renewable energy locally.

"Much of the growth in PNG's solar sector is being driven by individuals and private companies with their own energy transition goals," observes Christian Lohberger, President of the Solar Industry Association of PNG, who notes that steeply declining battery prices and the unreliability of both electric supply and diesel imports are factors combining to encourage uptake of solar.

This trend is being encouraged by international lenders.

The Asian Development Bank's US$300 million Sustainable Energy Sector Development Program will help PNG transition to a low carbon supply, while the IFC is currently helping to switch five regional grids from diesel to solar.

USAid is leveraging partnerships with organisations such as the Santos Foundation, TotalEnergies and MRL Capital to develop 26 solar mini-grids across PNG, while the Australian Finance Facility for the Pacific is financing the building of solar farms.

While Lohberger notes that "the biggest impediment is the weak regulatory space" in PNG, there is some progress in that area. PNG's central bank, the Bank of Papua New Guinea, recently launched its Green Finance Centre, partly to mobilise investment in renewables. ◆

Meeting PNG's fuel supply needs

PNG has faced ongoing fuel supply challenges since August 2023, as a result of issues related to its largest fuel importer, Puma Energy. Islands Petroleum is one of a number of fuel companies that have ramped up capacity to help meet demand. Chief Executive Nathan Bluett says the company is now looking to grow further.

By Paul Chai

More than one year after PNG's government declared a temporary state of emergency over fuel shortages, Islands Petroleum's CEO Nathan Bluett believes the worst of the crisis is over.

"We still see some ups and downs in the market, but, in every metro area and the regional areas which we service, there are service stations open with petrol and diesel," he says.

Stepping up

The crisis was precipitated when Puma Energy, PNG's largest fuel supplier, introduced fuel rationing in late 2023, in the face of what it claimed was lack of access to foreign exchange and local banking services. Acute shortages followed, especially of aviation fuel.

Puma's challenges led PNG's other fuel companies to step up. Ok Tedi Mining and Air Niugini moved to secure their own supplies, ExxonMobil PNG brought in additional fuel shipments, while Kumul Petroleum started creating its own fuel storage and distribution infrastructure (see box on page 53).

Meanwhile, Islands Petroleum, an independently owned fuel and lubricants distributor and the exclusive distributor of Mobil lubricants in PNG, leveraged its commercial relationships to help restore supply to the market.

Islands Petroleum's new 5 million litre storage tank in Lae.
Credit: Islands Petroleum

"ExxonMobil and its global resources were very quick to respond [when the crisis began]. They ramped up supply, and we were able to respond quickly in collaboration with them," Bluett tells *Business Advantage PNG*.

Islands heritage

Founded in Rabaul in East New Britain Province in 1980 as a small customs agency, Islands Petroleum now has depots and offices throughout PNG's islands and mainland.

And, with fuel shortages threatening to stall PNG's economic growth, Bluett says government agencies are starting to recognise the importance of the private sector in "keeping the wheels turning."

KEEPING PLANES IN THE AIR

PNG's ongoing fuel supply challenges have had a particular impact on the country's aviation sector. Now, steps are being taken to provide a permanent solution to the problem.

Aviation fuel shortages, caused by the challenges faced by Puma Energy, had a particular impact on the country's aviation sector in 2024, causing widespread flight delays and cancellations for the country's two major airlines, Air Niugini and Airlines PNG – and smaller operators too.

Solutions are in hand, however.

Credit: Air Niugini.

"The reliable, sustained and compliant supply chain for fuel is critical to aviation in PNG," Gary Seddon, CEO of national airline Air Niugini, told the August 2024 Business Advantage PNG Investment Conference in Brisbane.

"With the support of our minister and [parent company] Kumul Consolidated Holdings, we were able to establish an alternative arrangement that looked after the majority of our fuel needs. However, fuel in regional areas is still an issue."

PNG's national petroleum company, Kumul Petroleum, is using its mandate to provide both short- and long-term solutions.

"As a PNG LNG project participant, we were more focused on upstream but when the crisis happened, we stepped in, supplying jet fuel, diesel, and unleaded petrol (ULP) into the country," explains Managing Director Wapu Sonk.

While PNG has sufficient infrastructure for ULP and diesel imports, at the time of writing Puma Energy had the only jet fuel infrastructure in the country, at Napa Napa outside Port Moresby.

Kumul Petroleum is now fast-tracking the construction of a jet fuel facility at Port Moresby's Motukea wharf which, Sonk says, will have sufficient capacity to meet "four-to-six weeks supply" of aviation fuel for the whole country.

'That should be online in the first quarter of 2025," he advises.

The company has increased its capacity by 10 million litres in the past year, with the commissioning of a 5 million litre tank in Rabaul and an additional 5 million litre tank in Lae.

"And we have further plans for more," Bluett says. "We see gaps in the market for a reliable supplier, and our supply chain means we can be flexible with where the product comes from.

"It has been very strong with ExxonMobil, which helped us through the crisis."

PNG's fuel market is complex because of its small, regional centres that are not serviced by roads, Bluett explains.

For this reason, Islands' next focus is to improve its shipping capacity.

"After the fuel crisis, we are the sole supplier in several places now and we take that responsibility to the community very seriously."

Supporting the extractive industries

Looking further afield, Bluett sees potential for "sensible market growth within our capacity," especially if major extractives projects such as Papua LNG and Wafi-Golpu go ahead.

"All these operations are in remote locations, requiring their fuel to be on time and on call all the time. If you are supporting the extractive industries, they want reliability, and that is what Islands Petroleum has always delivered," he says. ◆

A greater role for private producers?

PNG's private sector power producers are playing a key role helping the country meet its ambitious electrification goals. However, they tell *Business Advantage PNG*, there is the potential for them to do much more.

Dirio's gas-driven power plant uses gas from the PNG LNG project, under domestic market obligation provisions that will also apply to future gas projects. Credit: Dirio Gas & Power

By Nadav Shemer Shlezinger

Only 13 to 19 per cent of households in PNG currently have access to electricity, according to the Asian Development Bank and World Bank, but the country has ambitious goals to bring electricity to 70 per cent of its population, which would require adding around 320 megawatts (MW) to its current installed capacity of 600 MW.

This represents a "massive opportunity" for independent power producers (IPPs), according to David Burbidge, chairman of IP3, the peak body representing the country's private power generators.

He tells *Business Advantage PNG* there are short-term opportunities to add to the country's two main grids – Port Moresby and Ramu – if some of the structural challenges related to the sector can be resolved.

Following the recent completion of PNG Hydro Development's 56 MW Edevu hydropower facility in Central Province and PNG Forest Products' 12.4 MW hydropower facility in Morobe Province, IPPs provide more than 70 per cent of power generated for these two grids, according to Burbidge, with state-owned utility PNG Power Ltd (PPL) providing the rest.

Burbidge estimates IPPs could "almost instantly" add another 20 MW to the Ramu grid, with immediate benefits to businesses in the city of Lae, by replacing off-grid generation by businesses "running their own generation because they don't trust PPL to give them reliable power."

Mini-grids

James Nelson is Chief Executive of Dirio Gas & Power, which is owned by provincial governments and landowners from five provinces through state-owned Mineral Resources Development Company.

Dirio opened its 45 MW gas-fired power station in Central Province in 2021, and Nelson sees opportunities to further add to Port Moresby's grid.

"When I look at the shape of the load curve, it tells me there's quite a portion of unserved demand," he notes.

Nelson is "most excited" by the opportunity provided by renewable energy, specifically solar mini-grids.

"We've got three standalone mini grids in three villages in Gulf Province in the advanced stages of a feasibility study," he says. "We'll hopefully bring that to tender in the next six months."

Regional centres

Another IPP, NiuPower (owned by Kumul Energy and Santos), currently operates the 58MW gas-fired Port Moresby Power Station, drawing its gas from the PNG LNG project.

NiuPower's Chief Executive Michael Uiari sees opportunities for IPPs to work with PPL to address capacity issues on regional grids.

"We're promoting a model where PPL leases out a provincial centre, but without relinquishing ownership," he says.

"Once that capital recovery has happened, the grid can revert to PNG Power, and they'll have a properly functioning, break-even or profitable provincial centre.

"If we can see if this particular model works, then it will address a really big drain on PPL's cash reserves."

Re-capitalisation

Ultimately, the financial stability of PPL will be critical if IPPs are to remain viable in the marketplace. IPPs were claiming at least K820 million in arrears owed to them by the state power company at time of writing, according to David Burbidge.

"We are aware of the issues," Moses Maladina, Chairman of Kumul Consolidated Holdings (PPL's holding company), told the 2024 Business Advantage PNG Investment Conference, acknowledging the utility's need to be "re-capitalised".

Additional funds in the 2024 National Budget to address arrears, and the National Energy Authority's recent decision to allow an increase in electricity tariffs after a ten-year freeze, should help if fully implemented. ◆

Connecting PNG to the world wide web

PNG is undergoing a digital revolution, with massive investment taking place in both mobile and fibreoptic infrastructure. Here's what business can expect in coming years.

By Charlotte Armstrong

A total of 12,000km of fibre-optic cables has been laid to date as part of PNG's broadband network, the National Transmission Network (NTN), owned and managed by state-owned telecommunications wholesaler, PNG DataCo.

This is in addition to the extensive mobile tower networks being ever-expanded and upgraded by PNG's three retail telcos: Digicel PNG (now owned by Australia's Telstra), Vodafone PNG and state-owned Telikom PNG.

Vodafone PNG was launched by Fiji's Amalgamated Telecoms Holdings in 2022 and is in a race to build out a network to rival PNG's largest, owned by Digicel. So far, Vodafone has invested some K3 billion in its rollout and expects to have over 1,000 mobile towers operational by 2025, according to Chief ICT Sales Officer, Jasneel Singh.

PNG's retail telcos could soon be sharing mobile tower infrastructure under PNG DataCo's planned rollout of carrier-neutral towers.

Credit: Vodafone PNG

While PNG has now rolled out telecommunications connectivity to 80 per cent of its population (according to a recent statement by Steven Matainaho, the Secretary of PNG's Department of Information and Communications Technology), its next challenge is encouraging greater adoption.

Investment plan

Over the next 15 years, PNG Dataco's K1.272 billion Digital Infrastructure Investment Program is focused on expanding the reach of the NTN to remote parts of the country, fibre-to-the-premises connections in its towns and cities, faster data speeds and more data centres.

"We are thinking of building an additional three or four more new data centres, because the take-up is just exponential," says Dataco's General Manager Engineering, Tony Morisause.

"We are also helping new ISPs to come up into the space in order for us to grow penetration so that we can utilise the massive capacity that we have already built."

The wholesaler is also building a network of 500 carrier-neutral mobile towers to encourage retailers to take their services into uneconomic areas.

With many of PNG's resources projects in remote areas, low earth orbit satellite also plays an important role. Remote operators already have a range of options (see Inside View below) and more are likely, with OneWeb and Starlink set to enter the PNG market. ◆

THE INSIDE VIEW: ROBBIE HUXLEY, CEO & MANAGING DIRECTOR, TE (PNG)

TE (PNG) has been facilitating communications for some of the biggest resources operations in PNG for close to 70 years. CEO and Managing Director Robbie Huxley explains how it's done.

We've been involved in many major mining projects in PNG, including Ok Tedi, Frieda River, Kainantu and Simberi, and have been enabling the radio migration from analogue systems to digital for many of our clients.

We try to keep up to date with technologies from our key manufacturers in Australia and New Zealand. Telematics, GPS capacity, and cellular-to-radio communication have been features we've rolled out among our clients as part of staged upgrades.

Our biggest advancement in the satellite space has been the new technology from Kymeta, a flat-panel antenna. It works on an electronically steerable beam which can lock onto the satellite 144 times a second, so it's perfect for motion-use.

This has enabled our clients to have fantastic reliability on their vessels at a much lower cost than the parabolic antennas that were designed for tracking. It's given them a lot more freedom over where and how to connect to the internet at an affordable price.

PNG's climate presents a lot of challenges. For example, a lot of our satellite deployments are by helicopter. You can only really afford to go in there and do it right the first time. We've also had to find ways to make the equipment fit for purpose, ensuring that it can survive the harshness of the climate, and that it's still just as reliable.

In terms of the future, we're looking forward to major upcoming projects. The next 18–24 months will see the current market remain stable, until Wafi-Golpu and, potentially, Papua LNG take off. Then, we'll hopefully see quite a boom for the next few years.

KUMUL PETROLEUM: A MULTI-FACETED FORCE FOR DEVELOPMENT

As implied by its name, Kumul Petroleum Holdings Limited is the national petroleum and energy company, whose principal source of income is its shareholding in the PNG LNG Project, recently increased to just over 19% after purchase of additional equity from Santos.

The company's activities have expanded over the years as it has undertaken various projects using its net income after payment of dividends to the State.

KPHL operates the Kumul Petroleum Academy, providing specialist industry technical training and is constructing a large Training and Fabrication Facility at Caution Bay close to the LNG plant, where it will be a foundation for the Central Special Economic Zone.

KPHL is operator of four petroleum retention licences, where it is carrying out studies to ascertain the feasibility of aggregating and commercialising the gas reserves already discovered in these. Aggregating these previously 'stranded' fields could feed an additional LNG train when the Caution Bay LNG plant expands to process gas from the Papua LNG Project. A 79-kilometre seismic programme over two of these licences will commence in late 2024.

After agreement was reached with the other PNG LNG Project joint venture partners in late 2023, KPHL now markets its share of LNG produced, over and above that committed to long term sale contracts, managed by the company's marketing office in Singapore. KPHL's first LNG shipment to PetroChina was made in April 2024.

At the request of Government, KPHL has also intervened to address the fuel crisis caused by Puma Energy's inability to trade and has been importing fuel, principally Jet A1 and diesel. To provide a longer-term solution KPHL is constructing fuel import and storage infrastructure on the shores of Port Moresby's inner harbor.

In populous areas of the Highlands KPHL has constructed more than 200 kilometres of low voltage transmission lines and associated equipment using local contractors. This rural electrification infrastructure enables many schools, health centres and communities to connect to the high voltage lines of PNG Power's Ramu grid. KPHL is also an equal partner with Santos in NiuPower, which operates a 58MW gas-fired station that despatches electricity into the Port Moresby grid.

KPHL is proud to support major health infrastructure at the Port Moresby General Hospital – the National Heart Centre, the cancer unit and a surgical ward. It has also supported the cancer services unit at ANGAU Memorial Hospital in Lae and provided medical equipment to regional hospitals in Mendi, Kiunga and Rabaul.

In a more philanthropic vein KPHL spends millions of kina a year funding small scale community development projects and certain sporting codes.

As the scope and geographic spread of its activities has increased, KPHL has recruited graduates in a variety of disciplines to work alongside senior national technical staff, many of whom have decades of international working experience in the petroleum industry. Staff numbers now total more than 110, whilst executive management stability has been enhanced by Mr Wapu Sonk, KPHL managing director since 2013.

Ports get ready for business

Major upgrades of PNG's ports are under way, as the country prepares for increased economic activity over the coming decade.

By Paul Chai

PNG's port authority, PNG Ports Corporation, is in the process of conducting a major upgrade of the country's ports nationally, thanks in large part to A$621 million (K1.6 billion) in funding from the Australian Infrastructure Financing Facility for the Pacific (AIFFP).

PNG Ports is set to break ground on the Kimbe port facility upgrade at the end of the first quarter of 2025, while the upgrade of Oro Bay is expected to start at the end of 2024.

Chief Executive Neil Papenfus said there are also "really exciting prospects" for Kavieng, which will enter construction in 2026, while a feasibility study on the upgrade of Rabaul is under way with assistance from the European Union.

But, as Papenfus told the 2024 Business Advantage PNG Investment Conference, the fact that most of this money will need to be repaid puts the impetus on the state-owned entity to address profitability across its network.


PNG Ports CEO Neil Papenfus

Currently, 12 of PNG's 15 ports run at a loss and are cross-subsidised by the ports of Lae (which accounts for 54 per cent of PNG's trade volume), Motukea in Port Moresby, (27 per cent) and Kimbe (7 per cent).

here are radical plans afoot to change that.

"We are now re-conceptualising these ports as green ports or business-enabling ports," Papenfus noted. "We are looking to seriously assist local communities to set up processing plants, cool rooms for agriculture or fishing or rubbish recycling."

The new 45-hectare Westside industrial park and logistics hub in Lae is a prime example of this approach.

Situated at the Lae Tidal Basin and under "ongoing and staged development," Papenfus said work on water, sewage, storm-water drainage, 4.8km of roads and lighting has already been completed.

"We believe [Westside] could be the industrial heartland of Lae," Papenfus said. "It is suitable for manufacturing, processing, warehousing, general cargo storage, dangerous goods storage, fuel farms, office complexes or project staging, and we will start to look at the possibility of using it as a special economic zone."

The international terminal at Lae's port is also continuing to benefit from additional investment from operator ICTSI South Pacific, which has installed the country's first ship-to-shore cranes, as well as new rubber-tyre gantry cranes and a new empty container handler. This has resulted in significantly increased productivity on the quay. ◆

THE INSIDE VIEW: RANDY SELVARATNAM, COO, SWIRE SHIPPING

Randy Selvaratnam, Chief Commercial Officer for leading regional logistics provider, Swire Shipping, talks shipping services connecting PNG, freight costs, and the move towards 'green' shipping.

"Shipping volumes have been fairly stable for some time now. In the absence of any major developments, further progress on planned LNG projects may serve as a catalyst for future growth.

As the projects come along, we are able to cater to that through the various parts of our business, and obviously the Papua LNG project is a key one.

We understand that importance of service and reliability for customers, which is why in 2023 we launched our first ever fixed-schedule weekly service, which connects PNG and the Pacific Islands with Southeast Asia, Europe, India and the Middle East. We have two other fixed fortnightly services we offer into PNG that come out of China and then we also have a fixed fortnightly service that runs out of Australia.

The global container shipping industry is facing multifaceted challenges, with rising demand, geopolitical tensions and environmental issues. Freight spot rates are on the rise and delays and congestion are being observed at ports around the world.

This has been particularly evident in the Asian ports recently, where congestion has caused disruptions to shipping schedules, and delays which could potentially impact deliveries into PNG.

At the moment, our focus is on operational efficiencies across the fleet and in the use of energy efficient technology that allows us to reduce emissions.

We have been looking to provide pathways for customers through practical, verifiable and cost-effective means, and have since developed the Swire Shipping Green Voyages Program, which will offer customers the ability to abate the carbon emissions of their cargoes by using sustainable biofuels.

Recently, we completed a sustainable B24 biofuel trial in the trans-Pacific Sun Chief Express Ocean service, which is projected to reduce well-to-wake emissions for our customers by an estimated 15 per cent."

VODAFONE – SHAKING UP THE MOBILE TELECOMS MARKET IN PNG

Vodafone Papua New Guinea, a subsidiary of Fiji's Amalgamated Telecom Holdings Limited, is Papua New Guinea's newest mobile services provider, and has been operating in the market for just over two years now.

Since its entry, Vodafone has significantly disrupted the mobile and telecoms space in PNG, offering individuals and businesses greater choice, improved service levels, enhanced connectivity, and increased affordability.

BETTER, FASTER

Since inception, it has invested over PGK 3 billion in a robust and resilient network, with four strategically-located data centres and over 800 towers covering all 22 provinces. All Vodafone sites are 4G+, which sets the company apart from its competitors. This newer technology means Vodafone customers get a better and faster data experience.

In a short span, Vodafone has acquired over a million subscribers and 25% market share, which continues to grow each month. It operates approximately 35 direct and dealer-operated retail outlets and over 7,000 touchpoints where customers can access its services nationwide. The telco employs just over 1,200 staff, 95% of which are locals, generating a further 3000 jobs indirectly.

BRIDGING THE DIGITAL DIVIDE

All this has facilitated greater take-up of mobile services and helped PNG take significant steps towards bridging the digital divide, with profound socio-economic benefits for the country.

With a mobile penetration rate of just 30%, PNG still lags behind many neighbouring countries.

Studies indicate that, in emerging markets, every 10% increase in broadband penetration can lead to a 1–2% increase in a country's GDP. If penetration is boosted by another 50%, it could rise to 5–10%.

Vodafone believes that connectivity is a basic human right. It is committed to making technology accessible to everyday people and driving penetration up to 70% over the next 2 to 3 years.

EVOLUTION

The mobile industry is evolving rapidly. With recent advancements and the availability of new technology such as subsea fibre cables, AI, cloud computing, and satellite technology, Vodafone is well positioned to revolutionise economic sectors such as finance, education and health.

Reliable and affordable connectivity is essential in today's digitally-connected world. The telco has a comprehensive suite of business products and solutions to help customers with their digital transformation journeys.

VODAFONE'S FUTURE

With its initial network build project nearing completion, the focus will now shift towards the next phase: network expansion and optimising network performance.

Vodafone is collaborating with industry stakeholders to pursue co-location opportunities, leveraging shared infrastructure to connect more people across the country. Its goal is to reach approximately 1,200 towers by the end of 2025 and then progressively grow the footprint to cover at least 95% of the population in the 2 to 3 years following.

Vodafone's ongoing investments in PNG will continue to stimulate the market, create employment opportunities, and foster economic growth.

It is looking forward to continuing its mission to transform the lives of Papua New Guineans.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