



Stepping up

Activity is increasing, both on land and beneath the sea

FAST FACTS: NEW ZEALAND

Capital:	Wellington
Population:	4,327,944
Currency:	New Zealand dollar
GDP Growth:	1.4% (2011 est)

BY RICHARD BARKER

NEW Zealand's position at an active continental margin on the Pacific Rim ensures it has young mountains, active volcanoes, geothermal activity and a wide range of geological environments.

Its small but active mining industry is producing gold, coal, iron sands and non-metallic minerals with a value of close to NZ\$2 billion (US\$1.6 billion) annually, about half of which is exported.

Exploration activity picked up by about 30% in 2011, compared with 2010, with NZ\$37 million being spent on greenfields exploration and related activities mainly targeting gold and iron sands (onshore and offshore).

The hard-rock gold producers have continued to expand their resources with Newmont Mining Corp discovering a 600,000oz resource within a new vein system – Correnso – at Waihi in the North Island, OceanaGold Corp maintaining resources at its Macraes and Reefton mines in the South Island, and encouraging results from several gold prospects.

The government has completed an airborne geophysical survey of the northern North Island and is carrying out another on the West Coast of the South Island to encourage exploration. Mining legislation and associated regulations are being reviewed to derive greater value from New Zealand's mineral and petroleum resource potential.

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The government, which has strongly supported an expansion of the resources sector as a major component of its economic strategy, was re-elected in a general election in late 2011. Its goal of increasing exploration for minerals and petroleum has the support of 67% of those surveyed in a July 2012 nationwide poll.

In a controversial move, New Zealand is seeking to sell up to 49% of four government-owned energy companies including Solid Energy, the main coal



producer, to raise funds and also expand the capital markets – which are relatively small and are a barrier to economic development.

New Zealand's economic growth rate is relatively low, at 1.7%, resulting from the lingering effects of recession, while inflation remains low at less than 2%. The reserve bank expects gross domestic product (GDP) growth to pick up slightly to just over 3% next year.

GOLD PRODUCTION

Three hard-rock mines account for most of the gold produced in New Zealand, which totalled about 377,000oz in 2011, down from 433,000oz in 2010.

Newmont's Martha mine at Waihi, 110km southeast of Auckland in the North Island, works an epithermal gold-silver deposit via an open pit on the former Martha underground mine, and two nearby underground mines developed recently by the company – Favona and Trio. Together these produced 96,000oz of gold in 2011.

OceanaGold is working two orogenic gold deposits in hard-rock mines in the South Island. Its surface and underground mines at Macraes in Otago are New Zealand's largest producers and in 2011 gold output was about 177,000oz. The company's Globe Progress hard-rock operations at Reefton added about 78,000oz to gold output in 2011.

Placer mining contributed a further 26,000oz of gold from operations located mainly on the West Coast of the South Island, with some production from the Otago and Southland regions.

At Bannockburn in Otago, private miner L&M Group

is commissioning an alluvial mining operation with a seven-year mine life working a 100,000oz gold resource.

In Southland, Waikaia Gold Ltd has obtained approvals for its new alluvial gold operation on the Waikaia River and expects to start producing during 2013.

Hard-rock gold explorer Glass Earth Gold Ltd has two alluvial gold-mining plants operating in Otago producing about 2,000oz/y and is planning to commission a third plant to increase this to 7,500oz/y, with the aim of part-funding its on-going hard rock exploration activities.

COAL PRODUCTION

Coal production is dominated by sub-bituminous coal for steel manufacture and electricity generation from the Waikato coalfields in the North Island, and bituminous coking coal produced for export from the West Coast of the South Island.

Open-pit mines account for about 80% of output, but with underground mines producing in both regions. Government-owned Solid Energy accounts for most of New Zealand's coal production.

Total coal production was less than 5Mt in 2011, down 7% from 2010. Production was affected by a six-month shutdown at the Spring Creek underground mine to make safety improvements following the Pike River underground coal mine explosions in 2010 that killed 29 miners.

The Royal Commission on the Pike River coal mine tragedy is due to report by the end of September.

Solid Energy has made a conditional offer to purchase Pike River Coal Co, owner of the mine, from



the company's receivers for an initial payment of NZ\$7.5 million, with further payments if production eventuates in the future.

Most coking coal is produced by Solid Energy's open-pit Stockton mine in the Buller district from a field that has now produced 50Mt of coal over the past 110 years.

Coal mine production is proposed by Bathurst Resources Ltd, an Australia-based company that is seeking consents to develop new export coking-coal mining operations in the Buller district on the West Coast. An appeal to develop the first significant new operation – the open-pit Escarpment mine – will be put before the Environment Court.

The appeal hearings will start in late October 2012 and are scheduled for completion in December. The company hopes to increase coal production progressively to about 4Mt/y.

New Zealand's largest known conventional energy resources are extensive lignite deposits in Southland with potentially recoverable resources estimated at 6,500Mt. Solid Energy is investigating a range of projects to develop these resources including the production of liquid fuels and fertiliser.

It is establishing a trial briquette plant in Southland to upgrade lignite for use as an industrial fuel. It is also investigating coal seam gas and underground coal gasification from New Zealand coalfields.

GOVERNMENT INITIATIVES

Government agency New Zealand Petroleum & Minerals (NZP&M) has completed an airborne geophysical survey of the Northland region in the North Island, releasing all of the results for the 12,500km² area in May 2012.

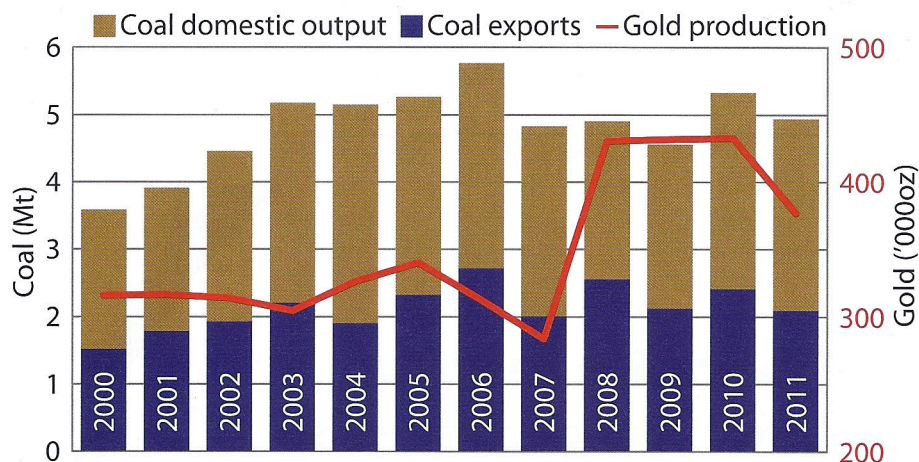
These provide a wealth of new subsurface information and include a geological interpretation to assist exploration (www.nzpam.govt.nz). Work-programme tenders for follow-up exploration are being sought for the part of the region with recognised potential for gold and base-metal mineralisation. Tenders close in December 2012.

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NZP&M hopes to release the results of a similar airborne survey of the West Coast region of the South Island in 2013. Both surveys use combined magnetic and radiometric methods.

In line with the government's policy of making more of New Zealand's resource potential, NZP&M is being strengthened with new staff, despite unpopular government cut-backs in other areas.

The Crown Minerals Act – the main statute governing petroleum and minerals in New Zealand – is being reviewed. The objectives of the review are to encourage the development of Crown-owned minerals so that they contribute more to New Zealand's economic development and to streamline and simplify the current regulatory regime.



MINERAL EXPLORATION

New Zealand's gold producers have stepped up their exploration activities, adding to the resources at the existing operations and investigating new prospects.

Within the Hauraki Goldfield at Waihi, Newmont announced the discovery of the Correnso gold-silver deposit, a concealed quartz vein system beneath 100m to 200m of barren rocks, located about 500m east of the historic Martha mine that has been worked as an open pit since 1987.

The historic mine produced 5Moz gold and 30Moz silver between 1883 and 1952. The discovery is located beneath a residential area in the town of Waihi and was drilled out from the surface to depths of up to 800m, some using innovative techniques including a modified underground drill rig enclosed within a shipping container.

A resource of about 600,000oz has been estimated. The company is now seeking consents for its development as an underground mine using existing underground access from the operating Favona and Trio mines.

A separate project is investigating the possibility of working ore beneath the northwest wall of the existing open pit via an exploration decline.

At the WKP prospect, 10km to the north of Waihi, Newmont, in joint venture with junior explorer Glass Earth Gold, has continued to produce encouraging results. The latest drilling produced a gold intersection of 17.2g/t over an interval of 9.7m from a depth of 146.1m.

All of the eight holes drilled here to date along a 600m strike length have produced potentially economic gold-silver intersections.

Exploration is continuing, and a 5,500m drilling programme is starting. Also in the Hauraki Goldfield and about 60km southeast of Waihi, Glass Earth Gold has been investigating the Muirs Reef prospect with surface sampling, geophysical investigations and drilling.

The best results obtained to date are 38.4g/t gold and 49g/t silver over 2m from a depth of 48m.

New Talisman Gold Mines Ltd (formerly Heritage Gold) is planning to re-develop the Talisman gold mine located about 10km west of Waihi, where it has established an underground, mainly inferred, resource of 205,000oz of gold at an average grade of 6.9g/t. The mine was a major producer a century ago.

In the South Island, OceanaGold has been investigating the Blackwater mine, near Reefton. It produced more than 700,000oz of gold from a very persistent gold-bearing quartz vein to a depth of about 600m before collapse of the access shaft in 1951 terminated operations. Drilling in 2012 successfully

intersected the high-grade quartz reef about 650m down plunge below previously mined workings.

Initial results from the first hole of a four-hole programme intersected 1.0m (estimated true width of 0.5m) of 23.3g/t Au. These results are consistent with historical widths and grades that were about 0.7m at 22g/t Au.

Australian explorer MOD Resources Ltd is investigating the Sams Creek prospect in the northwest of the South Island under an agreement with permit holder OceanaGold. The gold-sulphide mineralisation is hosted by a granite dyke that is 7km long and up to 60m thick.

The first stage nine-hole drilling programme carried out by MOD Resources upgraded JORC-compliant inferred resources at the main prospect by about 30% to 18.65Mt at 1.71g/t using a 0.7g/t cut-off grade, giving a total resource of 1Moz of gold.

Initial drilling results at the nearby Carapace prospect have given a grade of 10.5g/t from the surface to a depth of 5.2m. Exploration is continuing with three drill rigs on the site.

Several companies are exploring in the South Island for tungsten, platinum group metals and rare earth elements. Airborne geophysical data obtained by Glass Earth Gold over the central North Island and Otago regions in 2005 to 2007 has now been made public via the NZP&M open file report database.

OFFSHORE MINERALS

New Zealand has exclusive rights to seabed resources over an offshore area of about 5.7Mkm².

Legislation and regulations to manage the effects of exploration and production activities within this area are before parliament. Parts of the area are being actively explored for minerals and petroleum.

Chatham Rock Phosphate Ltd continues to investigate its Chatham Rise offshore seabed phosphate deposit with recent sampling, geophysical, geotechnical and environmental surveys of the prospect area, located 400km east of Christchurch.

The data will be used to design mining and environmental management systems with the aim of applying for mining approvals later in 2012. Past investigations have assessed a resource of about 100Mt of seabed sediment containing about 21% phosphate at a water depth of about 400m.

Interest in offshore iron-sand exploration has intensified with eight companies holding more than 40,000km² under permit and application. In addition, Nautilus Minerals Inc and Neptune Minerals Inc have permit applications for more than 50,000km² along the Kermadec Arc, where exploration and geological research has identified several areas with potential for seabed massive sulphide mineralisation.