

Industry insights

Westpac

Institutional
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Oil, gas and mining

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Summary

This is the first report in Westpac's new series of regular reports on specific sectors in the New Zealand economy. The purpose of these reports is to summarise the recent performance of these sectors, and to consider risks and opportunities and the resultant outlook for them. As well as providing key numbers on each sector, these reports will include insights gathered through interviews with leading industry players. This ensures a match between the numbers and the reality of real-world operations.

Why Oil, Gas and Mining?

The Oil, Gas and Mining sector generated around 0.9% of New Zealand GDP in 2014, or \$2.0 billion, and employed just under 7,000 full-time equivalent workers (FTEs). While the sector's share of employment and GDP is relatively small, it is capital intensive, with high production per worker, a large contribution to national gross fixed capital formation, a major role in exports, and in most cases, disproportionate concentrations of activity and employment in particular parts of New Zealand.

Given these characteristics, changes in the sector's fortunes have wide-ranging implications. These include impacts on the trade balance, investors in these capital intensive businesses, and the economic outlook of certain parts of the country where the sector is a major employer.

Recent performance of the sector

The Oil, Gas and Mining sector broadly enjoyed a strong period of growth between 2000 and 2012, but has since struggled with falling commodity prices. Employment grew rapidly during the boom years, up more than 4% a year, even through the uncertain years of the Global Financial Crisis. Indeed, gold, as safe haven, benefitted strongly from that uncertainty.

But a slowing Chinese economy, and a structural change in oil and gas exploration and extraction (O&G) technologies in the United States, have led to plummeting coal and O&G prices. Gold prices have also dropped, but not to nearly the same extent.

Quarrying and construction materials mining, largely engaged in construction of roads, footpaths, driveways and the like, saw little of the boom other mineral sub-sectors enjoyed. Booms in construction in Canterbury, and now Auckland, are boosting the sector in those regions. But elsewhere, road maintenance has been deferred and the sub-sector is

struggling, as quarries tend to be located close to where their products are used due to high transport costs.

Outlook and what this means for New Zealand

The fall in O&G prices has made it an attractive alternative to coal as a fuel option. This leaves coal (\$309 million in value added to New Zealand GDP in 2014) at the bottom of the mineral commodities heap from a New Zealand perspective. Prices are expected to remain depressed long-term, creating a real risk of further cost-cutting across New Zealand's coal producers, most notably on the West Coast and in the Waikato. This may well affect more jobs.

Oil prices (\$898 million in value added) are expected to recover slightly, as some high-cost producers are removed from the market internationally, reducing supply. Nevertheless, prices are expected to remain in the low US\$60s for the next 18 months. This will continue to discourage new exploration activity in Taranaki, Gisborne, the Great South Basin and elsewhere, affecting exploration and support service jobs. O&G is New Zealand's largest mineral export, which also implies significantly lower national export values.

The Quarrying and construction materials mining sub-sector (\$334 million in value added in 2014) is expected to see more consolidation of business ownership and mothballing over the next couple of years. This is the result of shrinking margins and the need for quarries to be located near where work requiring their outputs occurs.

Gold (\$309 million in value added) is the bright spot in the sector. A worse than expected global picture would drive investors back to this safe haven, while better than expected global conditions would lead to even higher growth in retail demand from BRIC countries. Tighter supply and the challenge of doing business in emerging gold producing countries is likely to keep prices well above US\$1,000 per ounce. While employment is unlikely to rise sharply, the economies of Waitaki and Hauraki in particular should be shielded from the large employment declines other sub-sectors have seen and may continue to see.

David Norman
Industry Economist

Introducing the sector

- Oil, Gas and Mining is a small employer, but highly capital intensive, meaning production per worker and capital requirements are high.
- The sector saw strong growth between 2000 and 2012, but that has been partially reversed as commodity prices have tumbled.
- In particular, jobs in O&G, Coal mining, Mining support services (much of which services O&G) and to some extent Quarrying and construction materials mining are at risk, as are export earnings.

The Oil, Gas and Mining sector generated around 0.9% of New Zealand GDP in 2014, or \$2.0 billion.¹ While this is a relatively small share of GDP, the sector accounts for a large proportion of export receipts, and given its capital intensive nature, is characterised by high levels of production per worker.²

This capital intensive nature means the sector requires regular large-scale investments, making it crucial that its risks and opportunities are understood by investors that provide this funding.

For the purposes of this study, we classify Oil, Gas and Mining into five sub-sectors:

- Coal mining
- Gold mining

- Quarrying and construction materials mining
- Oil and gas exploration and extraction (O&G)
- Other mineral, metal and support services, which includes all other mining activities as well as support services for the other four sub-sectors.

New Zealand's own Oil and gas exploration and extraction activities generated nearly \$900 million in value in 2014, while other mining activities including gold, coal, and quarrying and construction materials accounted for smaller shares. A large proportion of the Other mineral, metal and support services sub-sector services oil and gas.

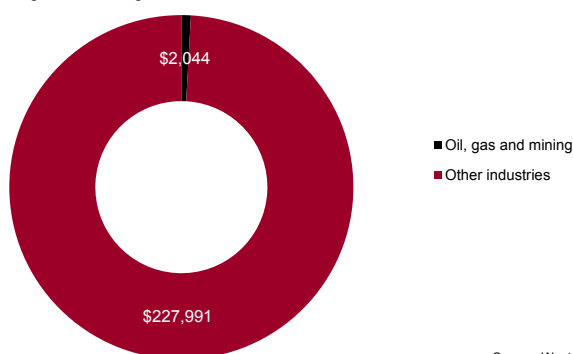
Dynamite comes in small packages

In employment terms, the sector is small. It employs only 1 in 320 of New Zealand's full-time equivalent workers (FTEs).³ But the sector makes extensive use of capital equipment, which means production per worker is high, and requirements for investment funding are high.

At nearly \$720,000 in value added per worker, O&G has one of the highest ratios in the economy. All other Oil, Gas and Mining sub-sectors also dwarf the national average production per worker. The overall average for Oil, Gas and Mining was nearly \$300,000 per FTE, three times the national average of \$103,000 per FTE in 2014.

Oil, Gas and Mining in the New Zealand economy

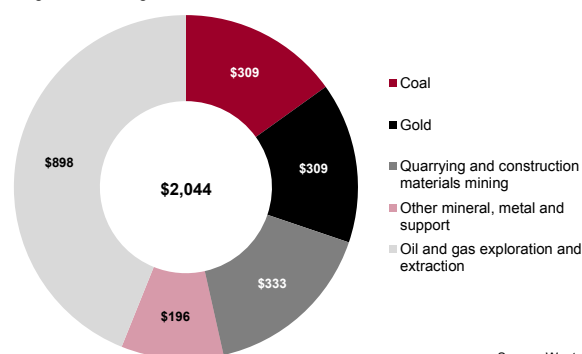
Oil, gas and mining value added, 2014\$m



Source: Westpac

Oil, Gas and Mining sub-sectors

Oil, gas and mining value added, 2014\$m



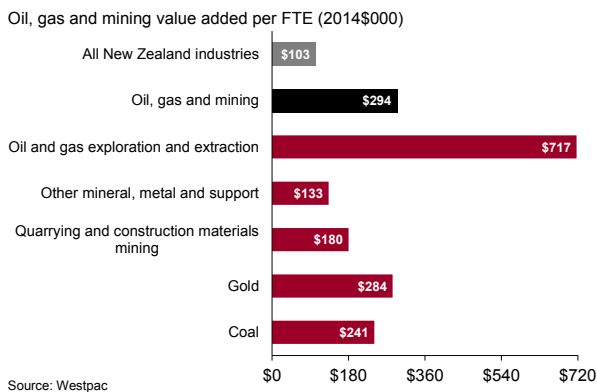
Source: Westpac

¹ We define Oil, Gas and Mining using Statistics New Zealand classification codes. We include all of Division B, which is Oil, Gas and Mining exploration and extraction.

² New Zealand GDP and the constituent value added by specific sectors or sub-sectors consist predominantly of pre-tax profits (economic profits) and salaries and wages.

³ FTEs count all full-time workers as one worker, and part-time workers as half an FTE.

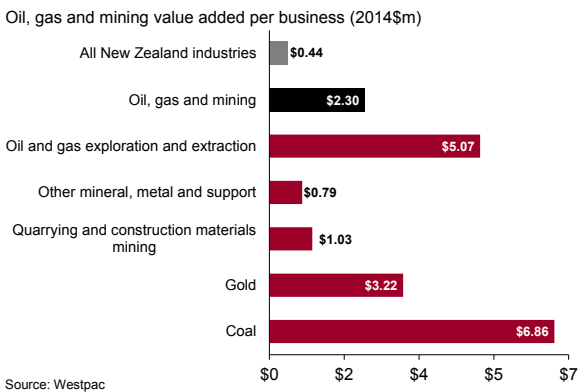
Oil, Gas and Mining value added per worker



Oil, Gas and Mining businesses also tend to be relatively big. On average, New Zealand businesses employ just 4.3 FTEs. Yet Oil, Gas and Mining businesses employed an average of 7.8 FTEs, almost twice the national average. This fact, coupled with the high levels of production per worker in the sector, mean that value added to the New Zealand economy per business is also far higher than the national average.

New Zealand businesses tend to be small, generating just \$0.44 million in value per business. The average across Oil, Gas and Mining businesses is five times higher, at \$2.3 million in value per business.

Oil, Gas and Mining value added per business

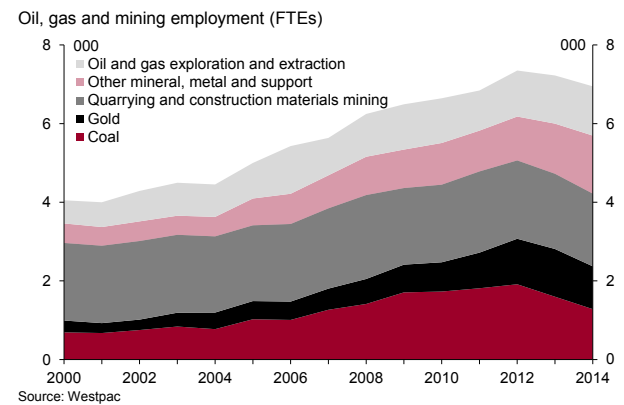


A boom and then?

Employment in Oil, Gas and Mining has grown strongly since 2000. Around 6,950 FTEs were employed in the sector in 2014, up from 4,050 in 2000. The additional 2,900 FTEs are equivalent to an annual growth rate of 3.9%, well above national employment growth rates since 2000.⁴

However, of concern is the reversal in employment trends between 2012 and 2014, as employment fell 5.5% in the sector. With mineral commodity prices continuing to fall since then, we would expect 2015 data, when available, to show an even greater fall.

Oil, Gas and Mining employment



Growth in the number of FTEs employed was spread fairly evenly across four of the five sub-sectors since 2000. The strongest growth in percentage terms was in Gold mining, adding nearly 800 workers off a low base. Nearly 1,000 FTEs were added to Other mineral, metal and support service employment, 600 to Coal mining, and 660 FTEs to Oil and gas exploration and extraction.

However, employment in Quarrying and construction materials mining fell by around 125 FTEs over the 14 years with an especially marked decline after 2008. Industry leaders suggest this is because the fortunes of the sub-sector are largely linked to horizontal construction – roads, footpaths, driveways and so on. While Canterbury has seen major horizontal construction projects related to the rebuild, councils in other parts of the country have been looking to defer maintenance and renewal work to reduce costs.

⁴ This detailed employment data is only available to March 2014, and does not capture any job changes as a result of the sharp fall in oil prices in the last 12 months.

Burning issues

- Sharp declines in commodity prices especially since 2012 have caused some pain in Oil, Gas and Mining.
- Coal and O&G in particular are dealing with structurally lower prices over the long-term, which will drive high-cost producers out of business or force them to dramatically reduce costs.
- Assets previously highly valued have proven or may prove worthless as commodity prices fall below the cost to produce, leading to potential job losses and other real economic costs.
- The structural change in coal and O&G prices implies that investors in the sector are likely to be cautious about investment. Divestment may occur where marginal revenues approach marginal costs, and producers may struggle to attract funding.

A new world of price pain

Over the last year, the United States has become the world's largest oil producer. Through adopting new and sometimes controversial technologies like hydraulic fracturing ("fracking"), the country has been able to extract oil and gas out of previously inaccessible resources. Fracking was once a relatively expensive process, but the United States has been remarkably innovative, making it far more competitive with traditional producers.

Fracking typically improves the proportion of O&G that can be extracted from around 10% by traditional methods, to 40%. This means even at higher gross extraction costs, this method of extraction can be competitive.

The result is that the United States, the world's largest consumer of oil and gas, is no longer reliant on imports to nearly the same extent. This has dramatically weakened the clout of OPEC, which used to vary supply to stabilise or increase prices when it was in their interests. The recent sharp decline in prices, however, has seen OPEC keep production up, presumably to maintain market share and sit things out until higher cost US producers are priced out and reduced supply pushes prices up again.

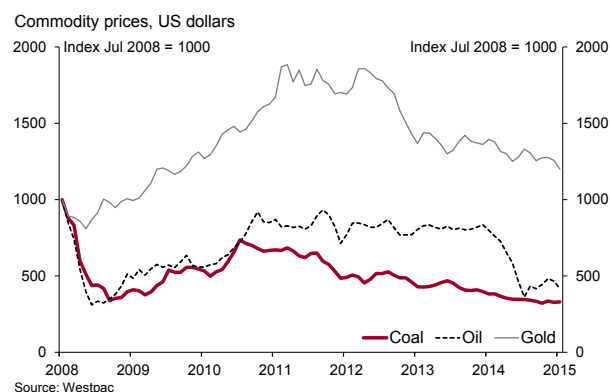
But the revolution in US oil production has created challenges for more than just the oil sub-sector. Cheaper oil as a result of the surge in production has also shifted demand toward oil and away from coal as a heating fuel. Coal had already been

priced cheaply for some years, so this is more bad news for that sub-sector.

Persistently low coal prices have already had an impact in New Zealand, with more than a hundred layoffs at Solid Energy, our major coal producer, in 2015. This followed 180 a year earlier. Industry commentators argue that until a sufficient number of the highest cost producers are driven out of business, global prices will remain subdued, making profitability a real challenge for remaining players.

There is no reason to expect oil and coal prices to rebound to where they were in the heady years of the end of the last decade.

Key commodity price changes



Meanwhile, gold, another key sub-sector, has been far less affected by price reductions. Although prices are off the highs of 2012, the current uncertainty in share markets may in fact push prices up as investors turn to safer options.

The New Zealand Emissions Trading Scheme

One potential risk to the sector that is receiving some attention is the price of carbon, as determined by the Emissions Trading Scheme and New Zealand's commitment to reduce greenhouse gases.

The Paris Protocol, the successor to the Kyoto Protocol, is expected to be signed in December 2015. The new Protocol will include new emissions reduction targets to be implemented from 2020.

New Zealand's targets are not seen as particularly ambitious, aiming to reduce emissions to 30% below 2005 levels by 2030, and 5% below 1990 levels by 2020. While there is a

price on carbon for outputs from specific sub-sectors, this is expected to continue to play a relatively small role in overall production costs.

Stranded assets

The question that springs from concerns over lower commodity prices is whether previously valuable reserves will be rendered worthless as the revenue per unit of extraction falls below the unit cost of extraction, and stays that way.

For instance, falling prices and tougher regulations in the United States have led to more than 260 coal mines closing there between 2011 and 2013, as continued production does not make sense given the price of coal and the cost of extracting it. Effectively, this means coal reserves previously valued at possibly tens or hundreds of millions of dollars have been stranded and written off balance sheets as businesses have determined that there is little likelihood of those reserves ever being tapped given coal prices and extraction costs.

These risks are real for New Zealand businesses as well, but we argue they are far more relevant for coal and O&G than for gold.

There are at least three reasons why assets could become stranded although ultimately they are all about the same fundamental point of revenues falling below costs:

- **Regulatory changes:** Much tougher climate change regulation, or other environmental or health and safety regulation, can make exploiting a particular resource, or even being in a certain industry, untenable, through a rise in production costs.
- **Demand changes:** Changes in world demand for certain commodities, such as a move away from heavy industry and to consumption-led growth in China, can dramatically lower prices for certain commodities on a long-term basis.

- **Technology changes:** New substitutes, such as electric cars, or more efficient techniques or technology, such as fracking, can significantly reduce demand or production costs, respectively. These both serve to bring prices down, pushing out higher cost producers.

Of these three risks, we believe technology changes are the greatest risk, and indeed we have seen significant changes in this space already. Structural changes in the O&G sub-sector due to new technologies being employed, particularly in the United States, have already occurred. High cost producers are at great risk of failure, and O&G assets where extraction is more challenging, or where controversial techniques cannot be used for regulatory reasons, have become far less valuable.

Demand changes of some sort will almost certainly occur at a global level over time, but these changes tend to be slower, and therefore provide more advance warning to investors as the value of the asset falls in line with shrinking margins.

Regulatory changes are the least likely of the three changes to dramatically affect New Zealand producers. As we have already pointed out, the proposed new emissions targets set by the New Zealand government are not particularly ambitious. However, many industry sources we spoke to mentioned that other compliance costs are rising. Nevertheless, these changes are incremental, and thus like demand changes, are likely to provide greater advance warning of pressures on production costs.

That said, sudden regulatory changes such as the recent coal testing regime implemented by China can effectively turn the tap to exports on or off, and can come with little warning. It is therefore possible that regulation by importers, rather than New Zealand-led climate change rules, may lead to a sudden change in prices and therefore viability of specific operations.

Coal and O&G in particular are dealing with structurally lower prices over the long-term, which will drive high-cost producers out of business or force them to dramatically reduce costs.



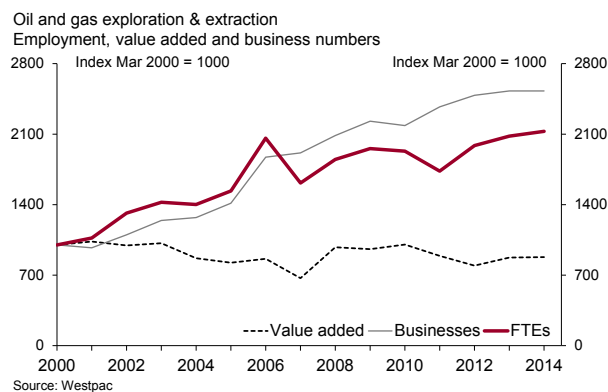
Oil and gas exploration and extraction

- Oil and gas (O&G) prices are now structurally lower in US dollar terms than they were just two years ago as production costs in the United States have fallen.
- Prices are expected to stabilise at around US\$60 a barrel over the next 18 months.
- This change poses an immediate challenge to New Zealand's O&G sub-sector, which had enjoyed many years of employment growth.
- The immediate impact has been a reduction in exploration activity in New Zealand although production is strengthening as Taranaki's Tui oil-field's production ramps up.
- In New Zealand, these long-term lower prices are expected to mean less exploration for longer, and fewer exploration and support service jobs in Taranaki and other exploration regions such as Gisborne and the Great South Basin.

Business numbers up, productivity down

Over the last 14 years, O&G has bucked the trend in the wider sector with the number of businesses in the sub-sector rising faster than employment. This means the average business size in employment terms has in fact fallen as many smaller businesses have emerged within the industry.

Fortunes of the O&G sub-sector



As with the other sub-sectors, value added has not been as strong as employment growth, meaning the production per worker has declined. In the case of O&G the decline has been particularly sharp, as the number of workers has more than doubled, but value added has fallen 12% in real terms.

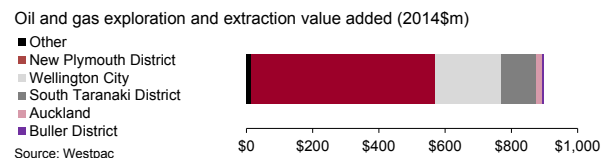
We would expect 2015 data to reflect some further downward pressure in employment as some exploration operations become less financially viable with falling oil prices. We discuss this decrease in exploration activity below.

The clean hand, dirty hand dichotomy

O&G is estimated to have produced nearly \$900 million in value in 2014, employing almost 3,100 workers directly.

Yet the data on where the industry is based yields some surprising results.

Where O&G is based

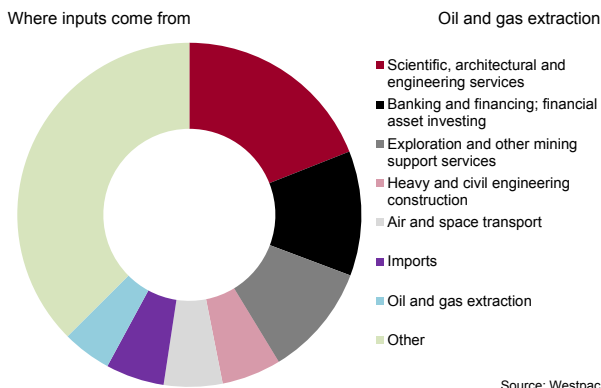


Apparently just under 60% of all production from the industry is in Taranaki, with around a quarter in Wellington. Yet we know there is not a single oil well in Wellington. The reason for this is that many companies operating in oil and gas exploration and extraction are headquartered outside Taranaki, particularly in Wellington and to some extent Auckland.

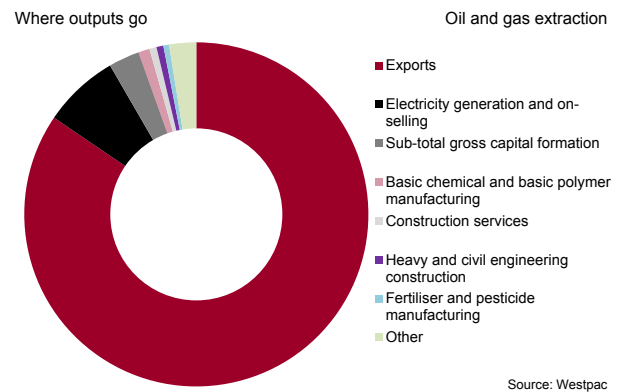
This can mean that employment and associated value added are at times attributed to an office block in Wellington, rather than a drilling operation off Taranaki. In other words, the output of the work is not always attributed to where the hands get dirty, as the data is based on where a business is headquartered. In the case of O&G, we anticipate that the actual value added in Taranaki is higher than the data suggests, and lower elsewhere.

Even applying the figures implied by where head offices are based, O&G directly accounts for more than 12% of all value added by New Plymouth's local economy, and nearly 6% in South Taranaki District.

Where O&G inputs come from



Where O&G outputs go



Where inputs come from and outputs go

National input-output tables allow us to examine which industries are major suppliers to an industry of interest, and where the outputs of the industry of interest go. So, for instance, we can examine which industries supply the inputs that make the O&G sub-sector work. We can also analyse what form the outputs of the O&G sub-sector take, whether as product feeding into another industry, or capital formation, for instance.

The O&G sub-sector draws on a number of specialist skills to deliver its outputs. These include scientific and engineering services, banking and finance support, exploration and other mining support services, and heavy construction. This means that a slow-down in exploration activity, as is currently being experienced (more on this later) has immediate impacts on employment across a wide range of industries. These industries provide exploration planning, design, resource consent, project planning, and engineering services among others.

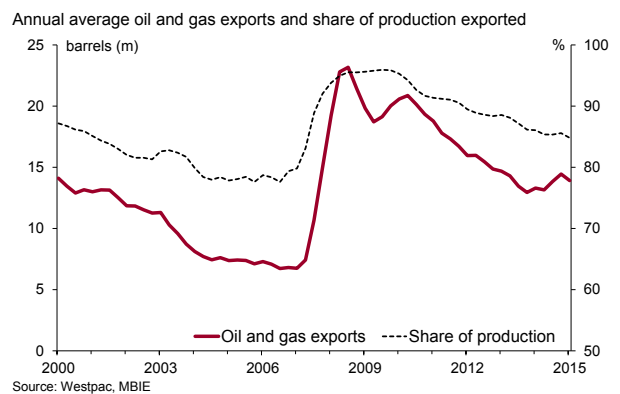
Outputs from O&G head mostly where one might expect. While most product is exported, a large proportion of output goes directly into energy generation. The sub-sector also produces significant amounts of fixed capital, as a capital-intensive industry. O&G outputs also support various construction processes and provide inputs into the fertiliser manufacturing process.

Production and exports

Annual average production surged in 2007 as the Tui oilfields came on-stream. Since the peak of September 2008, production has gradually declined, to around 16.4 million barrels a year in the March 2015 year.

The development of Tui led to a step change in the role of O&G in New Zealand exports. The share of production exported rose from around 80% to 96% as Tui reached maximum production. Over time, this figure has trended downward as Tui's production has come off, but still sits at around 85%.

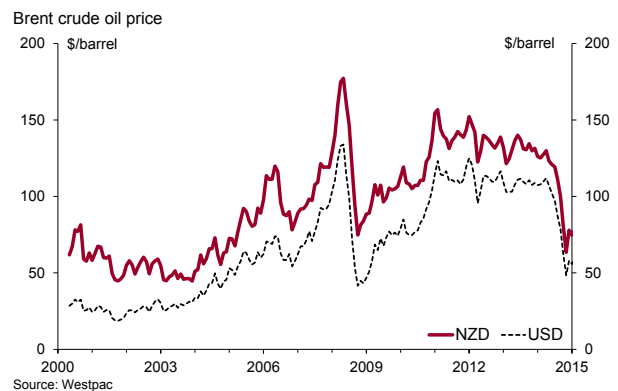
Changes in the role of exports in O&G



The oil price roller-coaster

Oil prices have fluctuated wildly over the last 15 years, varying between NZ\$44.65 and NZ\$177.30, a factor of four. In US dollar terms the variation has been even greater – a factor of 7.2. Interestingly, this implies that fluctuations in the New Zealand dollar have aided in buffering the New Zealand economy against greater volatility in US dollar oil prices.

Changes in oil prices, NZD and USD



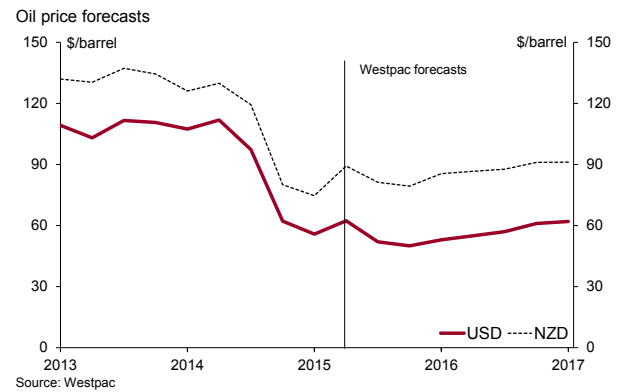
Nevertheless, this instability makes long-term investment in O&G that much more challenging. In the case of New Zealand, industry sources have suggested that when the price heads down, there is a near immediate impact on exploration work by smaller players. The latest downturn in price coincides with several other exploration projects across New Zealand ending, meaning work in the exploration space has dried up to a large extent.

The outlook for oil and gas

A decline in exploration activity, directly as a result of low prices, is reducing the likelihood of any medium-term boost in O&G production in New Zealand. That said, the government is investing almost \$10 million in a GNS-led project in the Great South Basin to prepare for a potential block-offer tender process after 2016.

Prices are expected to remain low over the next 18 months and beyond, with lower demand, and cheaper production out of the United States in particular.

Forecast oil prices, NZD and USD



Brent crude oil prices are expected to bottom out at around US\$50 a barrel before rising slightly to around US\$62 a barrel as marginal producers exit the market. But there is little reason at this point to expect a significant rebound in prices given the structural changes in the industry.

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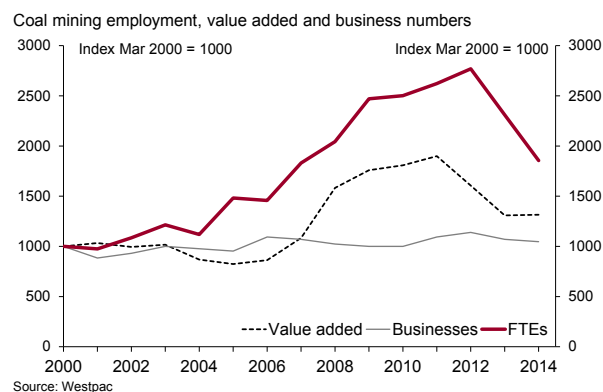
Coal mining

- After a strong period of growth between 2006 and 2012, Coal mining is experiencing a severe downturn.
- Falling demand from China, a major purchaser, and an accompanying price slump are already hurting employment in New Zealand.
- Cheaper O&G has provided alternative fuel sources for industry and energy production, meaning a structural shift downward in coal prices.
- There are significant risks to higher-cost coal producers on an ongoing basis.
- We can expect to see greater tightening at New Zealand's major coal producing facilities on the West Coast and in the Waikato, with potential further risks to employment in local economies where Coal mining is a major employer.

The rise and fall of coal

The 2014 contribution of Coal mining to GDP (\$309 million) is well off the high of \$445 million in 2011. GDP growth has been significantly slower than employment gains over the 14 years as well, suggesting the marginal production per worker has fallen as more jobs have been added.

Fortunes of the Coal mining sub-sector

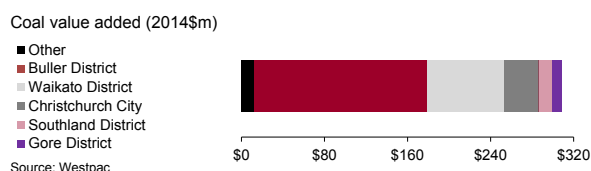


The number of businesses in coal mining has barely changed over the 14 years, indicating that average businesses size has risen sharply. Even with the steep decline in employment since 2012, overall business size in employment terms is all but double what it was in 2000. Yet GDP, or value added per business, has not grown as fast. This indicates that production per worker has fallen over the 14 years.

Where coal is produced

Coal mining contributed around \$309 million in GDP to the New Zealand economy in 2014, employing nearly 1,300 FTEs.

Where Coal mining is based



Around half of all coal mining activity was in Buller District, and three quarters of all coal mining activity occurs in the South Island, with smaller amounts in Waikato District. Nearly 96% of coal mining activity occurs in five districts.

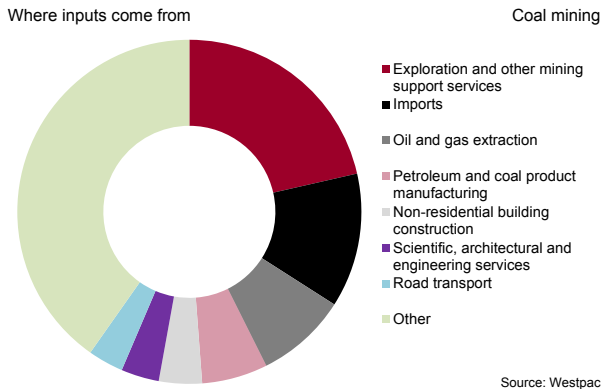
In Buller, Coal mining accounted for nearly 28% of all value added in 2014, meaning the district's economic fortunes are strongly tied to this sub-sector.

Where inputs come from and outputs go

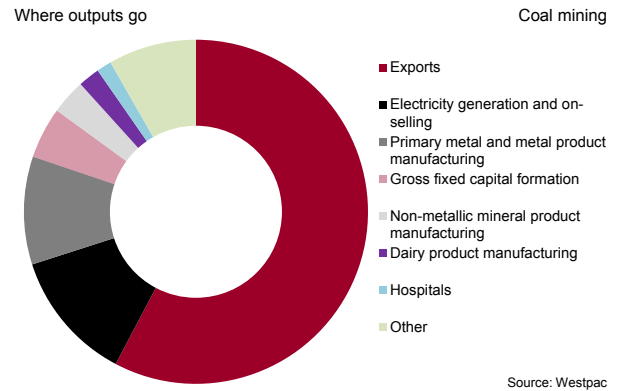
The Coal sub-sector draws on inputs from a large variety of other sectors, many of which are also within the Oil, Gas and Mining sector. These include Oil and gas exploration and extraction; and Other mineral, metal and support services. The profile of the sub-sector's inputs are not dissimilar to O&G. It also makes use of significant scientific and engineering services, meaning a slow-down will impact that industry as well.

The bulk of coal extracted in New Zealand is exported although significant shares are also used in electricity generation and various manufacturing processes. Coal mining also involves significant amounts of capital investment, with 4.8% of gross output being in the form of fixed capital formation.

Where Coal mining inputs come from



Where Coal mining outputs go



Changing output, changing prices

Over the last 15 years, coal production has grown sharply before falling away again although output is approximately 25% higher than it was in 2000. Output has varied between 3.38 million tonnes a year and 5.95 million tonnes a year over this period, peaking in March 2007. Between March 2008 and March 2013 output was roughly stable at around 4.8 million tonnes, but in recent times production has fallen to below 4.0 million tonnes a year.

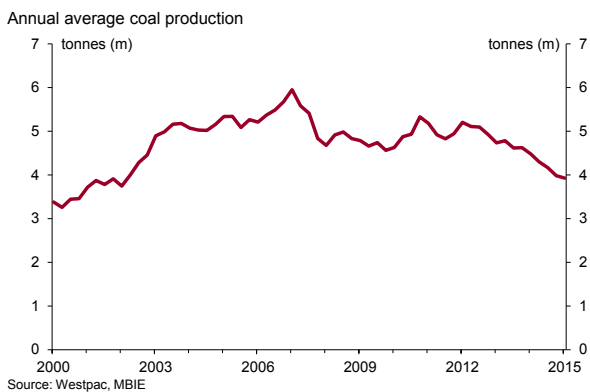
These changes in production have not been purely export-driven. There has been far less variation in the proportion of coal produced that is exported than in total production itself.

This means that slower production has not necessarily been the result of falling overseas demand. Much of the decline has been in demand from New Zealand consumers.

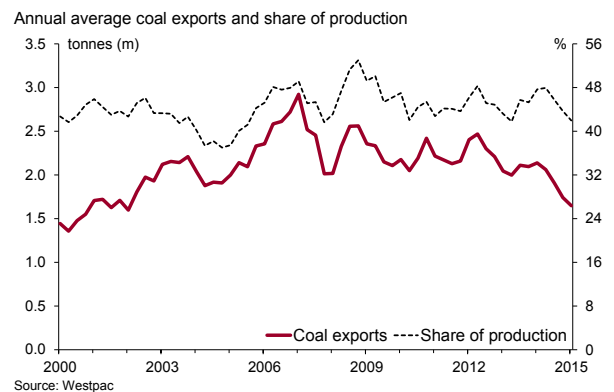
Coal prices have been particularly volatile in US dollar terms. From a low of just \$24.50 a tonne in September 2002, prices rose to \$193 by July 2008, an increase of 690%. Changes in the relative strength of the New Zealand dollar limited the surge to 490% between May 2003 and July 2008 in domestic terms. As with O&G, fluctuations in the New Zealand dollar have cushioned the volatility in coal prices expressed in US dollars.

However the currency has been less of a buffer on the downside.

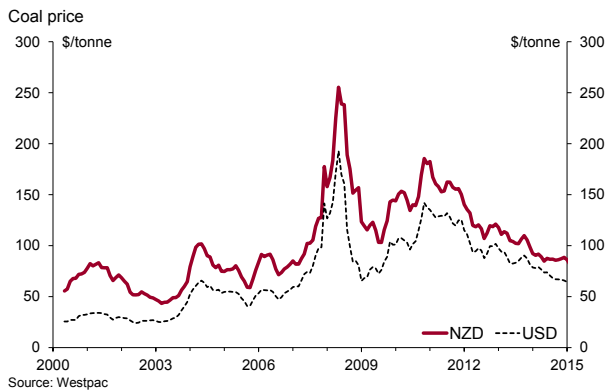
Changes in Coal mining production



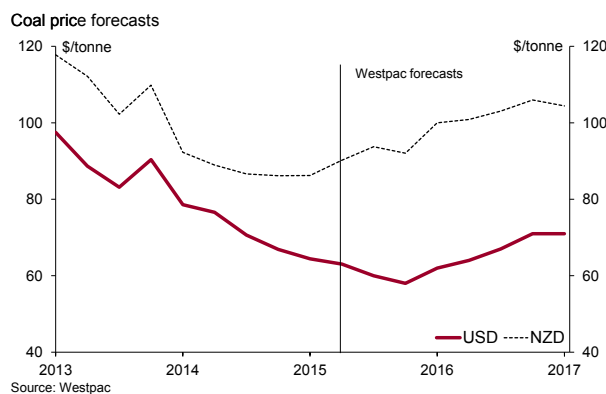
Changes in the role of exports in Coal mining



Changes in coal prices, NZD and USD



Forecast coal prices, NZD and USD



The outlook for coal

The outlook for coal is not particularly rosy. With oil and gas now relatively cheap as a substitute, coal is a far less attractive option and any lingering higher-cost production is likely to be squeezed out over the next 18 months.

Westpac forecasts show only a partial recovery in coal prices over the next 18 months. Thermal coal prices are expected to bottom out in the high \$50s before recovering to just over \$70 a tonne by early 2017. In NZ dollar terms, prices may be a little firmer, at just above \$100 per tonne.

A big part of the reason for ongoing weakness in coal prices is China's shift toward a lower GDP growth trajectory, and toward more of a consumption-based growth path. Over the five months to May 2015, for instance, coal imports to China fell 38% on the same five months last year. Even in the high consumption months of summer, imports have been down 34% on the same time a year ago.

At the same time, China has introduced stricter tests on imported coal, which many see as import restrictions designed to protect domestic producers. China states that the tests are designed to improve the pollution outcomes of coal being used. Regardless of the reason, coal imports by that country are far lower, and are expected to remain far lower than they have been in the past.

The implications for the New Zealand coal industry are unpleasant. There will be continued pressure to dramatically reduce costs to become more competitive in a lower-cost environment. Real risks of more job losses remain.

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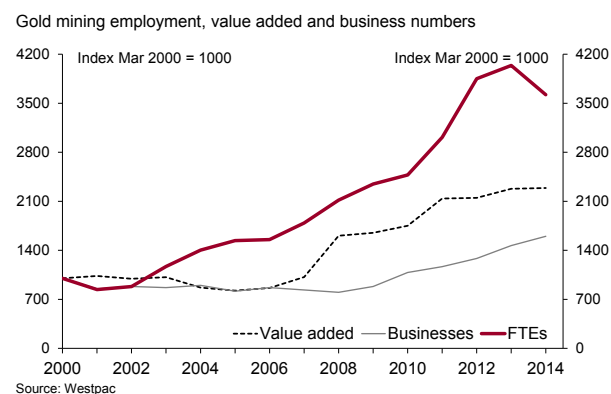
Gold mining

- Gold prices have come off all-time highs as the global economy has improved, but downward pressure has not been nearly as heavy as for O&G and coal.
- Growth in retail demand from BRIC countries and falling global supply have underpinned stability in the sub-sector.
- Deteriorating global conditions are likely to drive investors back to the safe haven of gold, which may push prices up again even if retail demand slows.
- This bodes well for New Zealand's gold producers, primarily in Waitaki and Hauraki, where Gold mining accounts for significant shares of local value added and employment.

The up cannot last forever...

Employment and GDP growth in the industry have risen rapidly over the last decade.

Fortunes of the Gold mining sub-sector



At the 2013 peak, employment in gold mining was four times the 2000 level. The value added by the industry has risen nearly 130% over the same time, and has held up even as employment trended down. The number of businesses in the industry has

risen somewhat over this time although this growth has been at the smaller end of the business spectrum. Most of these new businesses are likely to be providing support to the gold mining industry rather than directly mining themselves.

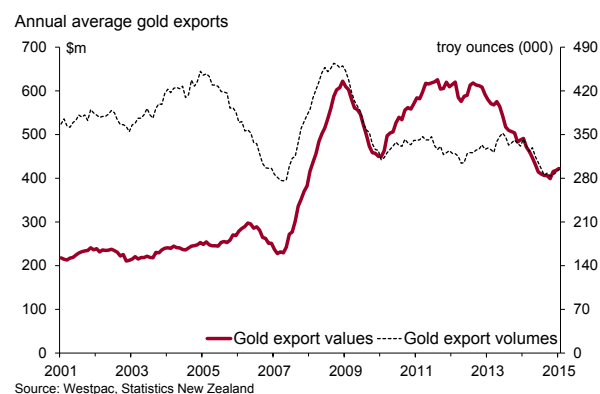
Unfortunately this data only goes as far as 2014. We suspect that 2015 data will show a further fall in employment, as gold prices have continued to come off their highs of well over \$2,000 seen in 2012. We nevertheless do not expect the falls to be as sharp as for coal.

...yet prices are far from melting

Gold export values tripled between 2000 and 2009, in large part the result of price surges. By the June 2009 year, annual exports totalled \$622 million.

In 2007, gold exports were at a low point in dollar and volume terms. Then the Global Financial Crisis sent investors in search of safe havens. Export volumes grew an estimated 55% in two years, while export receipts grew 148%.

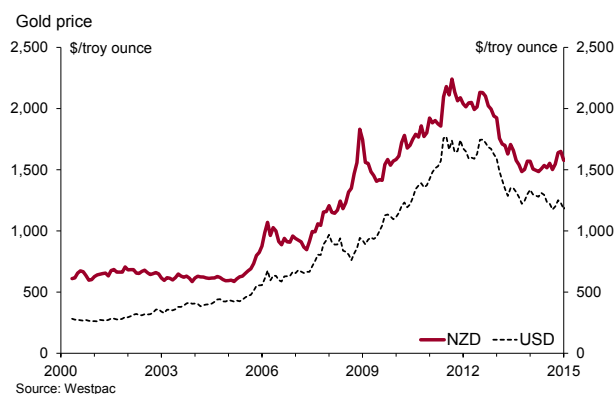
Gold mining exports



As world markets normalised, export volumes fell back to lower levels and have been largely flat since although there have been some ups and downs over the last year.

Prices are well off the highs of late 2011, but remain elevated, at well above NZ\$1,600 an ounce. This is nearly 180% higher than prices were 15 years ago.

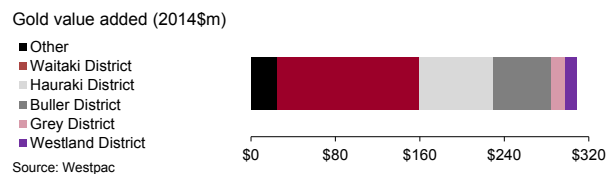
Changes in Gold prices, NZD and USD



The geographic distribution of gold

Gold mining contributed around \$309 million in GDP in 2014, employing nearly 1,100 FTEs.

Where Gold mining is based



As with coal, the South Island plays a key role in gold mining. Three districts dominate production – Waitaki, Hauraki and Buller – with smaller portions produced in Westland and Grey Districts. The two main producers are OceanaGold and Waihi Gold. More than 90% of gold mining activity occurs in just these five districts.

One in 26 FTEs in Waitaki and one in 36 FTEs in Hauraki are directly employed in Gold mining, making gold a major employer in these two relatively small economies. In value added terms, Gold mining is even more important, directly generating around 8% and 9% of value across Waitaki and Hauraki respectively.

The outlook for gold

Gold mining is not facing nearly the same risks to ongoing viability that oil and coal are:

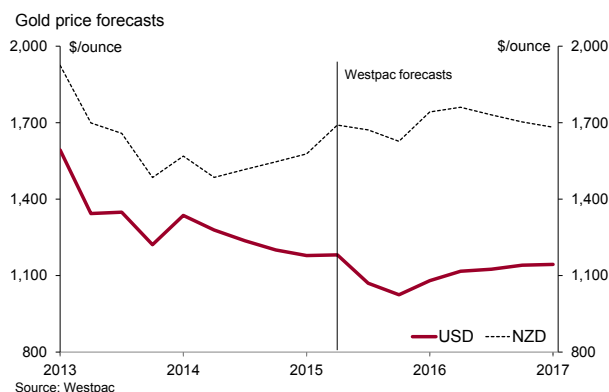
- Price levels have not fallen to the same extent as for other mineral commodities.
- Prices are still well up on where they were a decade ago in nominal and real terms, meaning the structural pressures coal and O&G are facing are absent.
- As the global economy weakens, investors are likely to return to safe havens like gold.

Industry sources point out that:

- Retail demand is growing across the BRIC nations
- Global production of gold is falling.
- Most new prospects are in countries in which it is hard to develop and operate.
- No major new discoveries or operations have begun in the last several years.

As a result, we expect that gold prices will hold up relatively well over the next 18 months.

Forecast Gold prices, NZD and USD



Prices are expected to bottom out well above US\$1,000, and to remain in the US\$1,100 to US\$1,200 band over the next 18 months. We would suggest that if the global economy slows down more than expected, there is additional upside potential for gold prices, as the downturn in retail demand would be more than offset by investor demand. A subdued NZ dollar will likely see prices hold up particularly strongly.

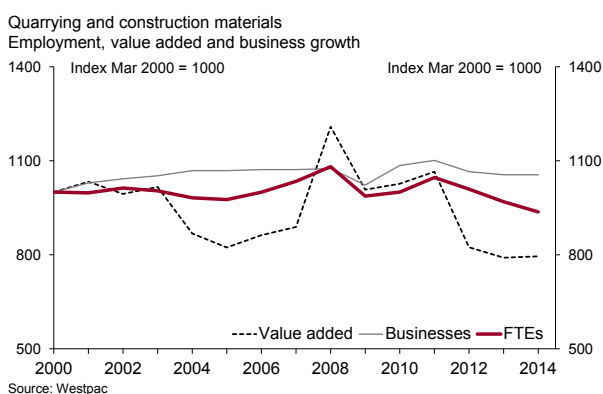
Quarrying and construction materials mining

- The Quarrying and construction materials mining sub-sector is less well understood and publicised than coal or gold, yet it contributes more to GDP than either of those sub-sectors.
- The industry is geographically dispersed as high transport costs make it important for materials to be produced near where work is done.
- Despite the Canterbury rebuild, Quarrying and construction materials mining has had a difficult 15 years, with little upswing during the boom.
- Expectations are for continued cost and revenue pressures on the sub-sector.
- We are expecting to see more consolidation of ownership, and mothballing of quarries until such time as they are needed for local projects.

An unimpressive run

Over the last 14 years, the fortunes of the Quarrying and construction materials mining sub-sector have been vastly different from those of the other sub-sectors this report reviews.

Fortunes of Quarrying and construction materials



Value added and employment have both fallen across the period of evaluation although value added in particular has been quite volatile. Business numbers have been flat throughout. The result is that, on average, Quarrying and construction materials businesses today are slightly smaller in terms of employment, and produce around 20% less in value per business than in 2000.

Even with the escalation in construction activity related to the Canterbury rebuild, activity in the sub-sector remained subdued. Industry sources suggest this was because road-building, which accounts for a large share of their outputs, was weak in other parts of the country.

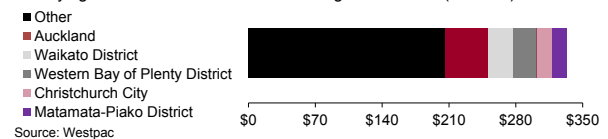
Local matters

Quarrying and construction materials mining is a surprisingly large industry, estimated at bigger than either the gold or coal mining industries in value added terms. The sub-sector is estimated to have generated around \$333 million in value in 2014, and employed around 1,850 FTEs.

Quarrying and construction materials outputs are generally high weight, high volume, low value products, which results in high transport costs. The closer production can be to where the products are ultimately used, the better.

Where Quarrying is based

Quarrying and construction materials mining value added (2014\$m)



Production is therefore spread across the country, although Auckland stands out as a lot of building activity is occurring there. The “Other” category is nearly two-thirds of production, indicating that unlike the other sub-sectors this report discusses, activity is not limited to a few major facilities, or particular parts of the country.

The outlook for Quarrying and construction materials

Industry sources indicate that the sub-sector faces a number of challenges. These include:

- Environmental compliance, health and safety regulation, and quality assurance and product compliance. These escalating costs are raising the cost of production, making financial viability harder.
- An aging management workforce and tougher educational requirements, which may lead to shortages of suitably qualified quarry managers.
- A continuation of the current challenging operating environment, leading to consolidation of quarry ownership among a smaller number of firms.

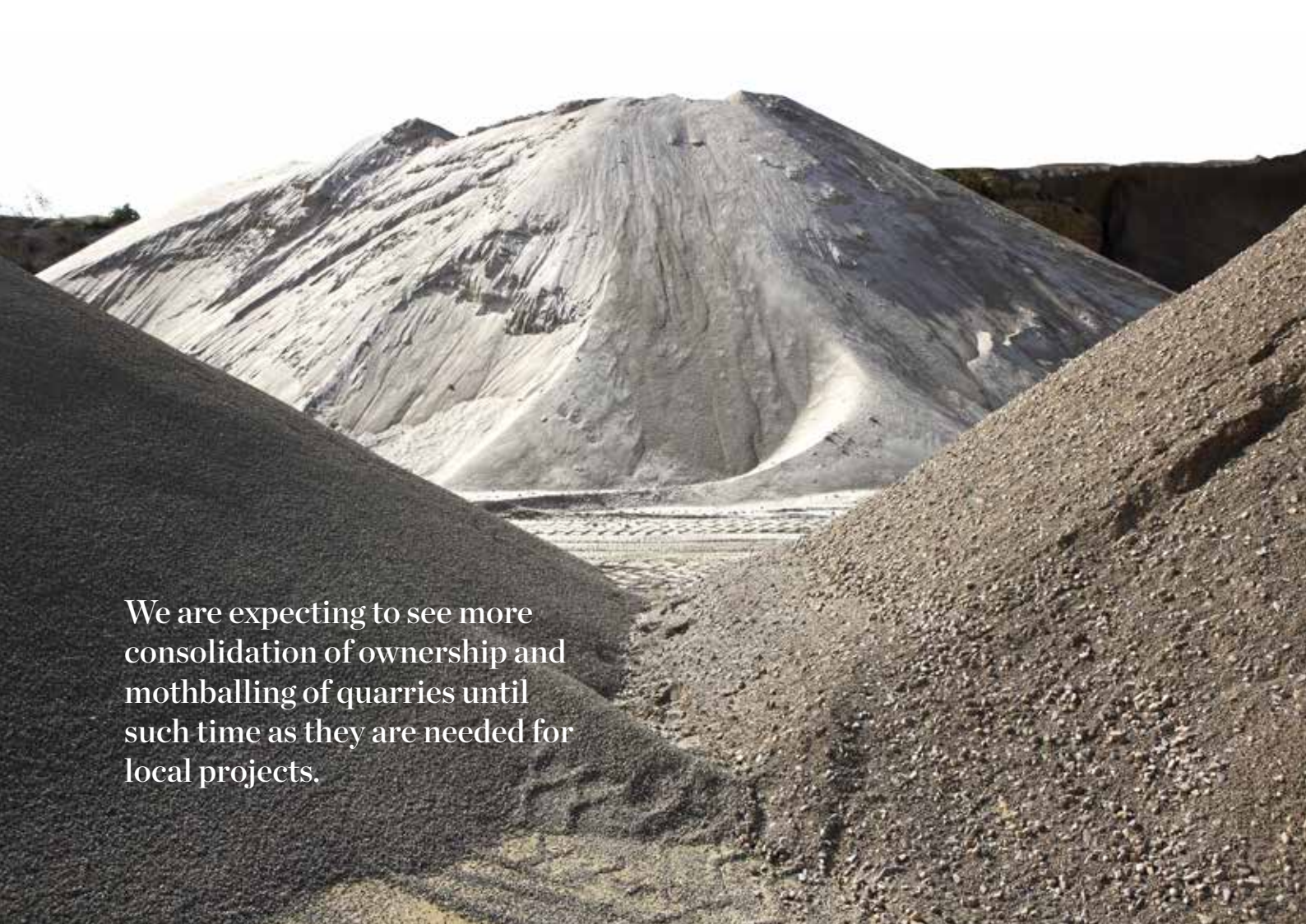
The need for quarries to be located near where the work requiring their outputs occurs, means a large number of quarries are likely to be mothballed until a local need to produce construction materials arises.

Westpac's recent reports, *Forewarned is forearmed and Outlook for Auckland residential construction*, highlight the geographic shift of construction activity from Canterbury to Auckland.⁵ This is being led by a fall in residential activity in Canterbury, with strong growth in Auckland. This will likely mean a boost to the sub-sector up north as fortunes in Canterbury turn down.

However, as highlighted already, much of the work that Quarrying and construction materials goes into is horizontal and non-residential construction. With significant work still to be done in Canterbury on that front, opportunities there should persist for some time.

The need for proximity also reduces the likelihood of the emergence of an export market. At times the sub-sector has been faced with competition from imports from low-cost producers in Asia.

Overall, we do not expect to see a major improvement in the fortunes of the sub-sector over the next two years.



We are expecting to see more consolidation of ownership and mothballing of quarries until such time as they are needed for local projects.

⁵ See <http://www.westpac.co.nz/assets/Business/Economic-Updates/2015/Bulletins-2015/Forewarned-is-forearmed-August-2015.pdf> and <http://www.westpac.co.nz/assets/Business/Economic-Updates/2015/Bulletins-2015/Outlook-for-Auckland-residential-construction-August-2015.pdf>

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