

# Petroleum and Minerals





**MINISTRY OF BUSINESS,  
INNOVATION & EMPLOYMENT**  
HĪKINA WHAKATUTUKI

MBIE develops and delivers policy, services, advice and regulation to support economic growth and the prosperity and wellbeing of New Zealanders.

MBIE combines the former Ministries of Economic Development, Science + Innovation, and the Departments of Labour and Building and Housing.

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# New Zealand Sectors Report 2013

The New Zealand Sectors Report comprises the Main Report and six additional, separate, reports providing an in-depth analysis of six individual sectors. The seven reports are:

**1 The New Zealand Sectors Report 2013: Main Report**

**Featured Sector Reports**

**2 Information and communications technology (ICT)**

**3 High technology manufacturing**

**4 Construction**

**5 Petroleum and minerals  
(this report)**

**6 Tourism**

**7 Knowledge intensive services**





## Minister's foreword

### **I am pleased to present this report on the growth of New Zealand's petroleum and minerals sector.**

The extraction of gold and coal has made an important contribution to the New Zealand economy since the mid-1850s. From the discovery of the Kapuni gas field in 1959, and the much larger Maui field in 1969, the petroleum industry has also played a significant role in New Zealand's economic development – as an energy source for industry and households, as an input into the chemicals industry, and as a valuable export.

In recent times increased demand for petroleum and minerals globally, driven in large part by the emerging economies in Asia, has seen substantially increased investment in exploration and the application of new technologies in both exploration and extraction.

This report shows New Zealand's petroleum and minerals sector is benefitting from these trends, with sustained growth for more than 10 years. Employment has doubled, and exports have tripled (in 2012 exports were worth \$2.8 billion\*). In the last six years a total of \$8.2 billion has been invested in petroleum exploration and development and \$213 million in minerals exploration. In the same period the Government was paid a total of \$1.9 billion in levies and royalties – \$380 million in 2012 alone.

New oil and gas finds are contributing significantly to New Zealand's exports. With more certain gas supplies we are also seeing renewed investment in downstream industries. An example is the re-opening of the Methanex plant in Taranaki. New capital investment is boosting methanol production capacity, with all the benefits this brings to the regional economy.

There are other benefits to the New Zealand economy. As the industry grows, it also drives growth in those New Zealand businesses

that supply it with goods and services, particularly in engineering and other support activities. A number of these firms are now taking their expertise into international markets, particularly Australia.

In recent times the industry has not been without tragedy. I'd like to acknowledge the 29 men who lost their lives in the Pike River disaster and the families of those men.

The Government has made a commitment to those families to ensure we follow through on every recommendation of the Pike River Royal Commission. There is still a considerable work programme underway, but the Government intends to have implemented its response to these recommendations by the end of this year.

Through a strong regulatory environment and the work of New Zealand Petroleum and Minerals, the Government is facilitating responsible exploration and development, the results of which will increase the welfare of all New Zealanders.

I hope this report will be read by many New Zealanders, and the key facts and figures it provides will improve the debate on the role this industry plays in our economy, now and into the future.

### **Hon Steven Joyce**

MINISTER FOR ECONOMIC DEVELOPMENT  
MINISTER FOR SCIENCE AND INNOVATION  
MINISTER FOR TERTIARY EDUCATION, SKILLS AND EMPLOYMENT  
ASSOCIATE MINISTER OF FINANCE

*\*Including gold and silver, but excluding coal. The value of coal exports is confidential.*

# Key terms and data limitations

## Defining sectors

A sector is an area of economic activity in which businesses or other organisations (e.g. government or voluntary organisations) share a similar market or produce a similar product or service. Examples are retailing (businesses that sell products directly to consumers) and telecommunications (provision of communications services using wired or wireless infrastructure).

This report uses data grouped into sectors using the Australian and New Zealand Industrial Classification codes (ANZSIC codes). A business or other type of organisation is classified to an ANZSIC code based on its predominant activity. The term 'sector' is often used interchangeably with the term 'industry'.

## Sources

The numbers in this report come from multiple sources. Data sourced from Statistics New Zealand is the latest that was available as at mid-December 2012. Some of this data is provisional and may change.

The data used covers different time periods for different metrics. For example, goods exports is for the year ended June 2012, while labour productivity is for the year ended March 2010.

## Export data

Some export data uses international sources in order to provide a longer time series. These sources may not agree with Statistics New Zealand data due to differences in the group of exported products being allocated to the relevant sector. See appendix for further detail on the calculation of petroleum and minerals sector exports.

## Use of the term 'firm'

The term 'firm' is used generically. It includes all relevant entities, some of which are not firms at all, such as those in the charities, government, education and health sectors.

## Example firms

This report provides examples of firms which are believed to belong to the sector. The example firms provide a partial answer to a key question on the composition of a sector: which firms are in it?

Firms are classified by Statistics New Zealand as being part of an industry sector according to their predominant activity. This is explained fully on the Statistics New Zealand website. The classification of each firm to a sector using the Australian and New Zealand Standard Industrial Classification (ANZSIC) system is **confidential** to Statistics New Zealand.

Because of the confidentiality rules, the Ministry of Business, Innovation and Employment (MBIE) has used other publicly available sources to determine which firms are likely to belong to a sector. These sources may be inaccurate or incomplete.

## Quotes and interviews

A limited number of interviews with sector leaders were carried out in the preparation of this report. Anonymous quotes from these interviews that illustrate key themes have been included. The opinions expressed are those of the industry participants. Additional quotes from public sources have also been used.

**A full explanation of the data sources and limitations is provided in the Appendix.**

## Report objective

The New Zealand Sectors Report Series is a set of seven publications that provides a factual source of information in an accessible format on the key sectors that make up the New Zealand economy.

New Zealand needs to encourage all industry sectors to operate at their peak potential to meet the goals of our Business Growth Agenda. This report provides information on New Zealand's petroleum and minerals sector.

The report does not intend to draw policy conclusions. Its aim is to provide a comprehensive report card on the state of New Zealand's petroleum and minerals sector for business people, exporters, policy makers, media commentators, economists, academics, students and anyone with an interest in New Zealand's economic development.

The Ministry of Business, Innovation & Employment (MBIE) welcomes comment and feedback on this report, and on the measures the Government is taking to facilitate the development of competitive and successful technology manufacturing sectors. Email [sectors.reports@mbie.govt.nz](mailto:sectors.reports@mbie.govt.nz)



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# Executive summary

## General

- The petroleum sector and the minerals sector are both highly capital intensive activities with a high commercial risk and long development cycles. In practical terms they are two quite different activities with little overlap. Minerals covers the exploration for and extraction of naturally occurring mineral solids, such as coal, gold and aggregate (rock, sand and gravel).
- Petroleum covers the exploration for and extraction of natural gas and crude oil. For the purposes of this report they are together described as 'the sector'.
- This report finds that the petroleum and minerals sector accounts for 2.5% of GDP and 6.2% of exports.\* In 2011 the sector directly employed 0.3% of the New Zealand workforce.
- The sector is the most productive in the economy, generating \$333 per hour worked, compared to the New Zealand average of \$48 per hour worked. Workers are paid on average \$105,000 per annum, over twice the New Zealand average.

## Business and employment

- The sector has seen sustained growth for a decade. Employment has doubled and the number of firms has grown by 60%.
- The sector has 12 firms that employ more than 100 people. Together these firms employ 3,880 workers, or 60% of the sector's total workforce (excluding self-employed).
- A small number of large firms generate the majority of exports, as is common in other small developed economies.
- Employment in petroleum is largely concentrated in Taranaki, but employment in minerals exploration and extraction is more

widely spread across the country, for example, limestone for agriculture and aggregate for roads and construction.

## Expansion and investment

- In 2012, 49% of firms in the sector invested in expansion, compared to 31% for the manufacturing sector and the New Zealand average of 26%. Expenditure on oil and gas exploration and development jumped significantly in 2007, and has totalled more than a billion dollars in each subsequent year. Similarly in 2012 expenditure on coal and mineral exploration and prospecting totalled \$47 million, an historical high.

## Exports

- Exports of petroleum and minerals have almost tripled since 2002, and were worth \$2,797 million in 2012 (excluding coal).\* Ninety-five per cent of these exports go to Australia. Crude oil and gold are New Zealand's largest and second largest exports to Australia respectively.
- High quality coking coal is the basis of the coal export industry. Coal exports were worth US\$394 million in 2012, with key markets being India, China and Japan.\*\*

## Impact on wider economy

- The petroleum and minerals sector has a significant impact on the wider economy in employment and business activity in downstream industries and in the procurement of a wide variety of goods and services. At the most fundamental level, fuel for transport is almost entirely derived from hydrocarbons, and as yet there are limited alternatives. From the point of view that society needs transport fuels to function, this is a key reason for developing these resources. New Zealand's exports of petroleum and coal to some extent mitigate the cost of importing fuels for transport and industry.

\*Including gold and silver, but excluding coal. The value of coal exports is confidential.

\*\*Source: UN Comtrade, MBIE analysis.

## Executive summary, continued

- Natural gas is a significant energy source for industry and domestic consumers in the North island, both directly and as a fuel for electricity generation. It is also a feedstock for the chemicals sector e.g. the manufacture of urea and methanol.
- Methanex's two methanol plants in Taranaki use large quantities of gas. Production of methanol is an important means of turning a 'difficult to export' commodity (natural gas) into a valuable exportable product (methanol). Recent investments in these plants by Methanex may result in exports worth up to a billion dollars annually over the next decade. Methanol exports in 2012 were worth US\$349 million.
- Production of aggregate is a vital input into the construction sector. Ironsand is mined for steel-making in the Waikato and for export.
- While gas is an important energy source for industry in the North island, coal plays the same role for industry in the South Island.

### Other minerals

- New Zealand has a significant gold export industry and a range of other valuable minerals such as ironsand, which are generating interest. Two additional examples are:
  - Trans-Tasman Resources to extract ironsands in the South Taranaki Bight.
  - Chatham Rock Phosphate to extract rock phosphate at shallow depths on the Chatham Rise.

### Future potential

- Currently all New Zealand's producing oil and gas fields are in the Taranaki region, which remains a focus for exploration. However, there are seventeen other basins in New Zealand which are likely to yield significant finds. These are still under-explored or not explored at all. Much of the recent and

intended investment in exploration is focused on these basins.

- The positive outlook indicated by the data for the last decade should be treated with some caution, as it includes the minerals boom driven largely by the emerging economies, particularly China. The most recent data shows substantial falls in the prices of both gold and coal. These are both minerals where most of the easily mined resources in New Zealand are close to exhausted, making operations in New Zealand more sensitive to price. Technically difficult and expensive underground mining is increasingly unprofitable.

### Change

- A number of influences are driving change in the sector, both in New Zealand and globally. Higher prices paid for oil together with new or long-standing (but more expensive) technologies are making non-traditional sources of oil and gas economic. This is driving structural change in the global oil and gas industry, with, for example, the likelihood that the United States may again become self-sustaining in energy production.
- This may mean that there will be less demand for coal for electricity production, while high quality coal for steel-making remains in demand.
- Globally there are increasing concerns over the impact of climate change. Natural gas, with its lower carbon content, is seen as a transitional energy source replacing higher carbon content fuels such as coal for electricity generation. Significantly increased production of so called unconventional gas is replacing coal as an energy source in the United States, with the result that the United States is one of the few developed countries to reduce carbon emissions in recent years.





## **SECTOR DEFINITION**

## Definition

This report uses the ANZSIC\* definition of 'mining' for its analysis

### Definition

#### ANZSIC Code B

The petroleum and minerals sector is called 'mining' in the formal ANZSIC classification. The sector includes firms that mainly extract naturally occurring mineral solids, such as coal and ores, but includes liquid minerals such as crude petroleum, and gases, such as natural gas. For this reason in this report we have called the sector 'petroleum and minerals'.

The sector covers a broad range of activities including: underground or opencast mining; dredging; quarrying; well operations or evaporation pans; recovery from ore dumps or tailings as well as beneficiation activities (i.e. preparing, including crushing, screening, washing and flotation) and other preparation work customarily performed at the mine site, or as a part of mining activity.

The ANZSIC definition distinguishes two basic activities: 'mine operation' and 'mining support activities'.

- Mine operation includes firms operating mines, quarries, or oil and gas wells on their own account, or for others on a contract or fee basis, as well as mining sites under development.
- Mining support activities include firms that perform mining services on a contract or fee basis, and exploration (except geophysical surveying).

The products produced by firms in this sector involve the minimum amount of processing to produce a marketable product.

### Exclusions

The definition excludes firms mainly engaged in refining or smelting of minerals or ores (other than preliminary smelting of gold), or in the manufacture of products of mineral origin such as coke or cement. The Tiwai Point aluminium smelter and the Marsden Point refinery, for example, are not part of this sector. These activities are classified to the manufacturing sectors.

## Sub-sectors

The sector is further segregated into a number of sub-sectors

Sub-sector	Activity	ANZSIC code
<b>Oil &amp; gas extraction</b>	Firms mainly engaged in producing crude oil, natural gas or condensate through the extraction of oil and gas deposits; does not include refining or manufacture of petroleum products.	B070
<b>Coal mining</b>	Firms engaged in opencast or underground mining of black or brown coal or peat cutting (except horticultural peat).	B060
<b>Metal ore mining</b>	Firms involved in ironsand mining, gold and silver mining, involving the minimum amount of processing to produce a marketable product; does not include smelting of aluminium or steel.	B080
<b>Construction material mining</b>	Includes firms involved in gravel and sand quarrying, crushing or screening crushed or broken stone for construction materials; includes the quarrying of clay, marble, granite, limestone, slate or dolomite for use as a manufacturing input.	B091
<b>Petroleum &amp; mineral exploration</b>	Firms involved in exploring for petroleum (oil and gas) and exploring for minerals (metallic and non-metallic minerals).	B101
<b>Mining support services</b>	Includes firms providing mining support services such as cementing oil and gas well castings, directional drilling and re-drilling, mining draining and pumping services, and oil and gas field support services.	B109

### Industry comment on definition

*There are two ways of measuring the oil and gas industry – a narrow definition that looks only at those directly involved, by which employment numbers look quite small, or by looking at the whole industry, whereby the many contractors and specialist people who work in the industry are included. Often these people are classified in other areas under Statistics NZ definitions. This is a global business and there are jobs for New Zealanders: the reality is that 5,500 Taranaki families are now reliant on this industry.*  
 – CE, Economic Development Agency.







## **THE GOVERNMENT'S BUSINESS GROWTH AGENDA**



# The Government's Business Growth Agenda

## Natural resources and safe workplaces

### Natural resources

- Introduce a competitive new system for releasing permits for oil and gas exploration.
- Further build our knowledge about New Zealand's petroleum basins and gas hydrates reservoirs through significant investment in research.
- Undertake competitive mineral tenders to explore, develop and produce minerals in a safe and environmentally responsible way.
- Respond to the Parliamentary Commissioner for the Environment's interim report on hydraulic fracturing.
- Complete an East Coast oil and gas development study.
- Set time limits and speed up consent processes under the Resource Management Act.
- Enable regionally important decisions to go direct to the Environment Court where appropriate.
- Streamline the regional planning process.
- Set a nine-month time limit for consenting projects of national significance.
- Implement the Extended Economic Zone (EEZ) legislation, including introducing regulations to maximise economic opportunities while better managing the environmental effects of activities within it.
- Investigate ways to get the best use from our resources including reducing structural and statutory impediments to governing our marine space.

### Harnessing the productive potential of Māori resources

- Work with Maori to identify and promote best practice governance models for collectively held resources.
- Establish a Forum with Māori and the private sector to discuss opportunities related to natural resources.
- Achieve improved Māori participation in natural gas management.

### Making workplaces safer

- Increase the capability and number of front-line health and safety inspectors.
- Develop the High Hazards Unit to improve workplace safety in mining and petroleum.
- Work with industry to implement sector and occupational health action plans which address specific workplace harms of significance.
- Work with the independent taskforce conducting an in-depth review of New Zealand's workplace health and safety regime.
- Introduce a safety star rating system for employers to acknowledge and showcase best practice in workplace injury prevention.



# The Government's Business Growth Agenda

## Innovation and skills

### Encouraging business innovation

- The establishment of Callaghan Innovation to encourage business innovation in science, engineering, and technology including in the petroleum and minerals supply chain.
- Increase business R&D co-funding by 21%, from \$117m per annum to \$142m per annum.
- Implement new approaches to business R&D grants to encourage business innovation including:
  - R&D Growth Grants: Targeting businesses with a strong track record for R&D spending in New Zealand, this is a three-year grant programme with a \$5m cap on funding per annum.
  - R&D Project Grants: Targeting firms with smaller R&D programmes and those that are new to R&D, typically providing 30-50% public co-funding.
  - R&D Student Grants: Providing support for undergraduate and postgraduate students to work within R&D active business.

### Developing innovation infrastructure

- Roll-out Ultra-Fast Broadband through fibre to 75% of New Zealanders by the end of 2019. Ultra-Fast Broadband will enable exporters to competitively deliver services offshore.

### Growing the innovation workforce

- Increase investment in engineering studies at tertiary institutions and lift graduate numbers by 500 per annum by 2017.
- Collect and provide better information on career prospects to students and the tertiary sector.

- Investigate highlighting innovation careers in science, design, engineering and maths to school students and their families.
- Maintain internationally competitive personal tax rates that encourage highly-skilled workers to work from New Zealand.

### Strengthening tertiary education

- Purchase additional tertiary places as required to meet demand across the sector, including in engineering.
- Complete the introduction of performance-linked funding to focus providers on achieving results for students.
- Publish employment outcome information and likely industry demand indicators, to better inform prospective students about study choices.

### Attracting skilled migrants and investors

- Review investor, entrepreneur and worker policy settings with a view to attracting migrants with the right skills and capital to invest.
- Introduce Silver Fern Visa to provide employers with greater access to young skilled migrants.
- Implement Immigration Global Management System upgrade and network configuration.
- Review the Essential Skills in Demand lists, to examine their effectiveness in addressing skills shortages in the short- and long-term.



# The Government's Business Growth Agenda

## Vocational education and investment

### Delivering vocational education and training that lifts skills

- Develop dedicated Māori and Pasifika trades training initiatives to increase participation and improve progression and earnings potential.
- Complete targeted review of qualifications at levels 1 to 6 to reduce the number of qualifications and simplify pathways for trainees and employers.
- Introduce clear vocational pathways for senior secondary school students and foundation learners, to provide clear options for those seeking vocational careers.
- Complete the Industry Training Review to create a durable system that lifts performance and qualification levels for all trainees.
- Introduce NZ apprenticeships and the apprenticeship reboot to ensure a durable system that lifts performance qualification levels for all trainees.
- Lift the number of Youth Guarantee places to support 16 and 17 year olds staying in education longer.

### Strengthening equity markets

- Partially-list four State-owned enterprises on the NZX exchange.
- Investigate options for lower cost public listing.
- Pass the Financial Markets Conduct Bill to make it easier for listed companies to raise capital.
- Make it easier for businesses to offer employee share schemes.
- Pass the Financial Reporting Bill to reduce unnecessary financial reporting costs for business.
- Established the Financial Markets Authority to promote and facilitate the development of fair, efficient and transparent financial markets.

### Attracting foreign investment

- Encourage a more positive environment for international investment and explain the benefits to New Zealanders.
- Align business law between New Zealand and Australia.



## **SNAPSHOT AND KEY THEMES**



## Sector overview

# New Zealand has significant petroleum & mineral resources, with most being owned by the Crown

### Oil & gas

New Zealand's producing fields are in the Taranaki Basin, which sits offshore and onshore of the west coast of the North Island.

New Zealand's other petroleum basins, particularly in deepwater frontier basins, are largely underexplored. However, they are considered to have significant potential for commercial hydrocarbon discoveries.

Almost all oil production is exported to Australia for refining. This is because New Zealand crude oil is very high quality and fetches a premium price on the international market. Cheaper foreign oil is imported to refine at the Marsden Point refinery. Most gas is used locally, while some is used as feedstock for the production of methanol and urea.

### Coal

In New Zealand the three most widely found coal ranks are:

- Bituminous – mainly exported for steelmaking
- Sub-bituminous – mainly used domestically for steelmaking at Glenbrook, power generation at Huntly, and industrial applications
- Lignite – low-rank coal mainly used for industrial applications. Lignite also has potential for other applications, including conversion to urea and liquid fuels.

Coal production is centred in Waikato, the West Coast and Otago/Southland. The majority of production is from Solid Energy's opencast operations at Rotowaro and Stockton and its underground mine at Huntly. About half of coal produced is exported.

### Gold

Gold has many uses from jewellery to computer chips and cell phone electronics, and as an investment in the form of bullion. Significant gold mines include: hard rock mines in Waihi, Macraes Flat and Reefton, Central Otago; and alluvial mines on the West Coast and in Otago.

### Other minerals

Other important minerals include: aggregates (used largely for roading and construction); limestone (used in fertiliser and industrial processes); ironsand (used for steel production); and silver, which is largely a by-product of gold mining.

### Offshore minerals

New Zealand has significant offshore mineral potential, including ironsands (off the North Island west coast), phosphate (Chatham Rise), gas hydrates (off the Wairarapa coast), and seafloor massive sulphides (Kermadec Arc and Colville Ridge).

### Ownership

Crown-owned minerals are those minerals owned and administered by the Crown, as set out in the Crown Minerals Act 1991. This means that these resources are owned by all New Zealanders.

Ownership of minerals includes all gold, silver and petroleum (oil and gas) in New Zealand's territory (onshore and offshore to 12 nautical miles), and about half of the in-ground coal, metallic and non-metallic minerals, industrial rocks and building stones. These resources are referred to as the 'Crown mineral estate'. New Zealand also has sovereign rights over, and manages, petroleum and mineral resources in the Exclusive Economic Zone (offshore between 12 and 200 nautical miles) and the Extended Continental Shelf.

Minerals that are not collectively owned by New Zealanders through the Crown are owned privately. Privately-owned minerals are, in most cases, owned by the land owner. Development of privately owned minerals is subject to the Resource Management Act 1991.

# Petroleum and minerals

## ANZSIC Code B

## Situation

This sector includes firms that mainly extract naturally occurring mineral solids, such as coal and ores, and includes liquid minerals such as crude petroleum, and gases, such as natural gas. The products produced by firms in this sector involve the minimum amount of processing to produce a marketable product.

Scorecard					
Measure	Total	% of NZ*	Growth (1 year)	Growth (5 yr CAGR)	Growth (10 yr CAGR)
GDP 2010 (nominal)	\$4,154m	2.5%	-3.1%	21.8%	13.2%
GDP 2012 (real)	n/a		-12.7%	4.8%	0.4%
Goods exports 2012 (excludes coal)	\$2,797m	6.2%	-1.7%	22.6%	11.1%
Employment 2011	6,960	0.3%	5.8%	6.6%	7.1%
Productivity 2010	\$333	688.9%**	5.3%	-0.6%	-3.3%
Fixed capital investment 2010	\$1,809m	5.9%	-15.9%	21.9%	13.5%
No. of firms 2012	644	0.1%	4.9%	6.0%	5.4%

Example firms			
Firm	Turnover (\$m)	Employees	Ownership
OMV New Zealand	\$670 (2009)	90	Foreign (Listed-ASX)
OceanaGold	\$390 (2009)	500	Listed (ASX,TSX,NZX)
Shell Todd Oil Services	\$240 (2012)	350	Private (Todd family & Shell)
Winstone Aggregates	\$220 (2012)	320	Fletcher Building
New Zealand Oil & Gas	\$106 (2011)	20	Listed (NZX)

Industry level financial performance				
	Total		Growth (1yr)	
	This sector	All sectors	This sector	All sectors
Total income per firm 2011 <sup>#</sup>	\$12,169,381	\$575,386	2.8%	4.7%
Total income per employee 2011 <sup>#</sup>	\$1,263,100	\$311,600	-1.7%	4.0%
Surplus per employee 2011 <sup>#</sup>	\$319,300	\$24,000	-15.9%	-12.7%
Return on equity 2011 <sup>#</sup>	23.4%	6.6%	down	down
Debt ratio (liabilities/assets) 2011 <sup>#</sup>	70.1%	64.1%	up	down
Capital stock per worker 2010	\$1,937,842	\$169,364	8.1%	5.2%

\* Equals % of total employing firms, except productivity, which is total measured sectors.

\*\*NZ average = 100%

<sup>#</sup>All sector total excludes some industries. Refer appendix, terms and definitions.

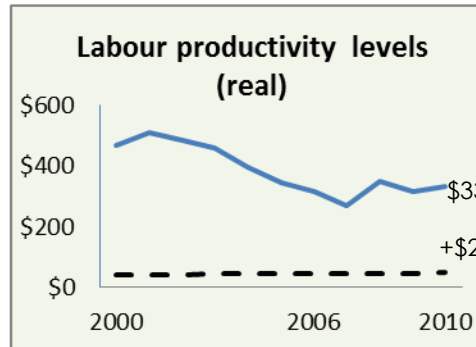
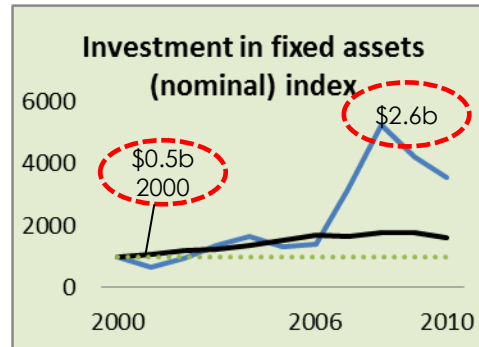
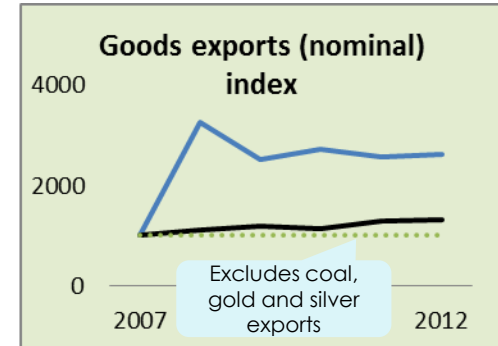
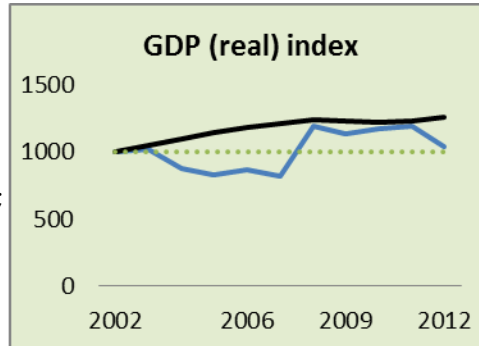
Key goods exported from this sector		Key markets, all goods	
Product (excludes coal)	Exports (\$m; 2012)	Country	Exports (\$m; 2012)
Crude petroleum oils	\$2,023.3	Australia	\$2,673
Gold and silver	\$714	Singapore	\$39
Other	\$22.7	Indonesia	\$25
<b>TOTAL all exports</b>	<b>\$2,797</b>	China (PRC)	\$22
<b>Note</b> Coal exports are confidential. In 2012 other countries reported imports of New Zealand coal worth US\$394m, with India accounting for 56%, China 30%, Japan 12% and all others 2%.		Japan	\$14
		Other	\$24
		<b>TOTAL all countries</b>	<b>\$2,797</b>



Key trends, various timeframes: 10-year index (base =1000) except productivity is \$ values – this sector vs all other sectors

### Comment

- Little real growth 2002–12; price driven nominal growth post 2007
- Small employer: 6,960
- Gained workers: +3460 (2001–11)
- Most productive sector in the economy; productivity declining
- Investment rose sharply from 2007
- Exports tripled in 2008; nearly all NZ crude oil is exported to Australia
- Outputs from this sector are inputs into construction & chemicals, plastics & refining manufacturing e.g. methanol production, fertiliser (urea)
- Sector growth drives demand in other sectors, e.g. engineering, IT services.



### Key

- Mining & Petroleum Extraction
- Other employing sectors
- ..... Starting point = 1000
- - - Measured sector

### R&D & innovation rates

R&D rate  
(% of firms)



Innovation rate  
(% of firms)



● High

◐ Medium

○ Low

### Export barriers: Current exporters

1. Other

% firms



2. Inability to increase supply



3. Distance from markets /  
Exchange rate volatility /  
limited access to finance



### Export barriers: Future exporters

1. Limited experience in  
expanding beyond NZ

% firms



2. Limited knowledge about  
specific markets



3. Exchange rate level /  
Exchange rate volatility /  
Distance from markets



### Internationalisation

% of petroleum &  
minerals firms exporting

%

% of petroleum &  
minerals firms with off-  
shore direct investment

6%

% of petroleum &  
minerals >50% foreign  
owned

16%

## Key themes

A number of key themes have emerged in the petroleum & minerals sector

Theme	Details	Examples
<b>Petroleum (oil and gas)</b>		
<b>Increased exploration / deep water developments</b>	Investment in petroleum exploration saw a rapid increase in 2007 and has remained at historically high levels.	In 2011 exploration and development activity was the highest it has been in the past 10 years, with 52 wells drilled, an increase from the 45 wells drilled in 2010 and the 37 wells drilled in 2009. There is increasing focus on exploration in New Zealand's deep water basins.
<b>Unconventional oil &amp; gas resources</b>	Higher prices and new technologies have made the extraction of unconventional oil and gas economical, including shale, coal seam and tight gases.	Shale gas production in the US has rapidly increased since 2005. In 2010, shale gas represented more than 20% of US gas production, driven by increasing application of techniques such as hydraulic fracturing ('fracking').
<b>Segmentation of industry</b>	The industry can be segmented into companies that focus on smaller onshore finds and those that focus on larger off-shore finds.	Tag Oil has focused on on-shore drilling and development of smaller shallow fields (typically up to 2 kilometres in depth), but is moving into higher risk higher return exploration targets (e.g 4-5 kilometre deep gas) Very large players have the capacity to explore for potentially significant off-shore finds, which are high cost to explore and develop.
<b>Coal</b>		
<b>Slowing demand</b>	Chinese demand for coking coal down Continuing low growth in US and Europe.	China's Performance Manufacturing Index (PMI) dropped to a 9 month low in August 2012 putting it into contractionary conditions for only the second time since early-2009.
<b>Increasing difficulty in accessing resources</b>	The costs of accessing coal resources are rising, and obtaining land access and resource consents for new developments can be slow and difficult.	Production at Spring Creek mine has been suspended because of the costs of extraction. Production at Huntly East underground mine to be cut by two thirds, as extraction is too expensive compared to opencast mining. Bathurst Resources has spent \$15m on obtaining resource consents for a new coal mine.
<b>Retrenchment</b>	Coal coming off record peak, causing mining companies to review operations.	Spring Creek mine put into care and maintenance by Solid Energy as production uneconomic at current price levels - staff numbers to be reduced from 254 to about 16. Production at Huntly underground mine to be cut by two thirds with the loss of 93 jobs.

## Key themes, continued

Theme	Details	Examples
<b>Health and safety issues</b>	The Royal Commission on the Pike River Coal Mine Tragedy made 16 primary recommendations directed at significantly improving health and safety in the New Zealand mining industry.	Both Government and industry are committed to implementing all 16 recommendations, including an effective regulatory framework for underground coal mining . A work programme is well advanced and should be completed by the end of 2013. Legislation giving effect to these proposals is expected to be passed in 2013.
<b>General</b>		
<b>Increased minerals exploration</b>	Investment in exploration and prospecting is at historical highs.	There are currently about 1,000 mineral exploration and mining permits across the country, with a further 134 mineral permit applications currently being processed by New Zealand Petroleum & Minerals. Two of these are major offshore mineral applications; <ul style="list-style-type: none"> <li>• Trans-Tasman Resources to extract iron sands in the South Taranaki Bight.</li> <li>• Chatham Rock Phosphate to extract rock phosphate at shallow depths on the Chatham Rise.</li> </ul>
<b>Mining going digital</b>	Large mining firms seeking efficiencies through increased use of information technology and automation and robotic technology.	<i>Rio Tinto is to become the owner of the world's largest fleet of driverless trucks after it signed a deal to buy at least 150 from Komatsu Limited over the next four years... These 150 new trucks will work with our pioneering Operations Centre that integrates and manages the logistics of 14 mines, three ports and two railways.</i> – Rio Tinto website
<b>Competing interests creating uncertainty</b>	There is an on-going debate in New Zealand society on the balance between the development of petroleum and minerals resources and, for example, the preservation of environmental values.	<i>Petroleum Exploration and Production Association Chief Executive David Robinson said the two-day [New Zealand Petroleum] summit would not shy away from challenging topics like community and iwi engagement, oil spill response or learnings and causes of major incidents.</i> - stuff.co.nz: Sept 19, 2012. Resource consents for Bathurst Resources to begin open-cast mining for coking coal on the Denniston Plateau were initially granted in August 2011, but have faced a number of challenges over environmental impacts, led by the Royal Forest & Bird Protection Society.

## Example firms: petroleum exploration and extraction

New Zealand has a strong group of major firms in the sector

### Brief profile of major identified firms in the New Zealand petroleum exploration and extraction industry

2012 or as available

Firm	Turnover	Employees	Ownership	Description
<b>Petroleum</b>				
<b>AWE (Australian Worldwide Exploration)</b>	A\$311m (2012 est)	100 (est)	Public (Australia)	Australian oil and gas exploration production company that operates the Tui oil field. New Zealand sales revenue in 2012 were A\$110m
<b>OMV New Zealand</b>	\$670m (2009 est)	90	Public (Austria)	Operator of the Maari oil field and a permit holder in the Maui and Pohokura gas fields. Operates multiple exploration permits in offshore Taranaki and also has interests in exploration permits in the Great South Basin.
<b>Kea Petroleum</b>	n/a	n/a	Public (UK)	'Kea Petroleum plc (AIM: KEA), the oil and gas exploration company focused on New Zealand.' Holds multiple exploration permits in Taranaki, producing oil at Puka.
<b>Shell Todd Oil Services</b>	\$240m (2012 est)	350	Private (Todd family and Shell)	A joint venture of Shell and Todd involved in the operations of the Māui, Kapuni, and Pohokura fields.
<b>New Zealand Energy Corp (NZEC).</b>	\$5m (2012 est)	30 (est)	Public, Canada	Holds multiple exploration permits in the Taranaki and East Coast basins, producing oil at Copper Moki.
<b>Origin Energy</b>	\$2.2b (global revenue, 2012)	n/a	Listed (ASX)	Origin is involved in the Kupe Gas field. Also has exploration permit interests in the Canterbury basin. Origin Energy, through its subsidiary companies, has a majority shareholding in Contact Energy.
<b>New Zealand Oil &amp; Gas (NZOG)</b>	\$106m (2011)	20	Listed (NZX)	Partner in the operation of Tui oil field and Kupe gas and condensate field. NZOG also has multiple exploration interests in the Taranaki basin and operates an exploration permit in the Canterbury Basin.

## Example firms: petroleum exploration and extraction, *continued*

### Brief profile of major identified firms in the New Zealand minerals & petroleum sector

2012 or as available

Firm	Turnover	Employees	Ownership	Description
<b>Petroleum</b>				
<b>Tag Oil</b>	\$50m	20	Listed (Canada)	Operates Cheal and Sidewinder fields in Taranaki. It also has a number of exploration interests in Taranaki and in the East Coast basin. Although listed in Canada, all Tag Oil's operations are in New Zealand. Similar to other oil exploration and extraction companies, most of Tag Oil's operations are performed by a large number of new Zealand contractors and suppliers .
<b>Todd Energy</b>	\$141m (2013, est)	250 (est)	Private	Todd operate the onshore McKee and Mangahewa fields. Todd are also partners in the Māui, Kapuni, Pohokura and Maari fields and are exploring further in Taranaki.
<b>L&amp;M Petroleum</b>	n/a	n/a	Acquired by New Dawn Energy Ltd in 2012.	Has exploration permits in Western Southland.
<b>Greymouth Gas Exploration (formerly Greymouth Petroleum)</b>	\$75m (2012)	110	Private	Operates the Turangi, Kaimiro, Ngatoro, Windsor, Kowhai, Moturoa, Radnor and Surrey fields. They also have further exploration projects in Taranaki and the Great South basin.
<b>Shell Exploration NZ Ltd</b>	n/a	n/a	Part of the Shell group of companies.	Shell are partners in Māui, Kapuni and Pohokura gas and condensate fields. Operate exploration permits in the Great South Basin.
<b>Anadarko Petroleum Corporation.</b>	n/a	n/a	Listed (US, NYSE)	An international company which is exploring in the Taranaki basin, Pegasus basin and Canterbury basin.

## Example firms: coal and minerals

New Zealand has a strong group of major firms in the sector

### Brief profile of major identified firms in the New Zealand coal and minerals industry

2012 or as available

Firm	Turnover	Employees	Ownership	Description
<b>Coal and minerals</b>				
<b>Solid Energy</b>	\$978M (2012)	1,658 (30 June, 2012)	SOE	Extracts, processes, markets and distributes coking, thermal and specialist coal.
<b>Bathurst Resources (New Zealand) Ltd.</b>	n/a	n/a	Listed (NZX)	Proposes to develop coal resources on the West Coast.
<b>OceanaGold</b>	\$385M (2012)	720 (620 in NZ)	Listed (ASX,TSX,NZX)	Gold production and mining, with hard rock mines at Macraes Flat and Reefton. Also has operations in the Philippines.
<b>Winstone Aggregates</b>	\$220M (2012)	320	Operating division of Fletcher Building	Producer of aggregates and sand.
<b>Newmont Waihi Gold</b>	\$215M (2011)	308+ (Website)	Public; USA (NYSE: NEM)	One of the world's largest producers of gold, with active mines in Nevada, Indonesia, Australia, New Zealand, Ghana and Peru.
<b>New Zealand Steel</b>	\$846M (2011)	1600	BlueScope Steel (formerly known as BHP Steel) Listed (ASX)	New Zealand Steel is vertically integrated with activities in mining iron ore (ironsand) and steel production at its Glenbrook steel mill.
<b>New Zealand Coal and Carbon</b>	50m (2012 est)	n/a	Private	NZCC encompasses two mining companies ROA Mining Company Ltd and Francis Mining Co. Ltd., with mining operations based on the West Coast. Exporters of specialist coals.
<b>Birchfields Coal</b>	n/a	n/a	Private	Produces coal for the industrial, service and primary production sectors in the South Island.



## **BUSINESS AND EMPLOYMENT**

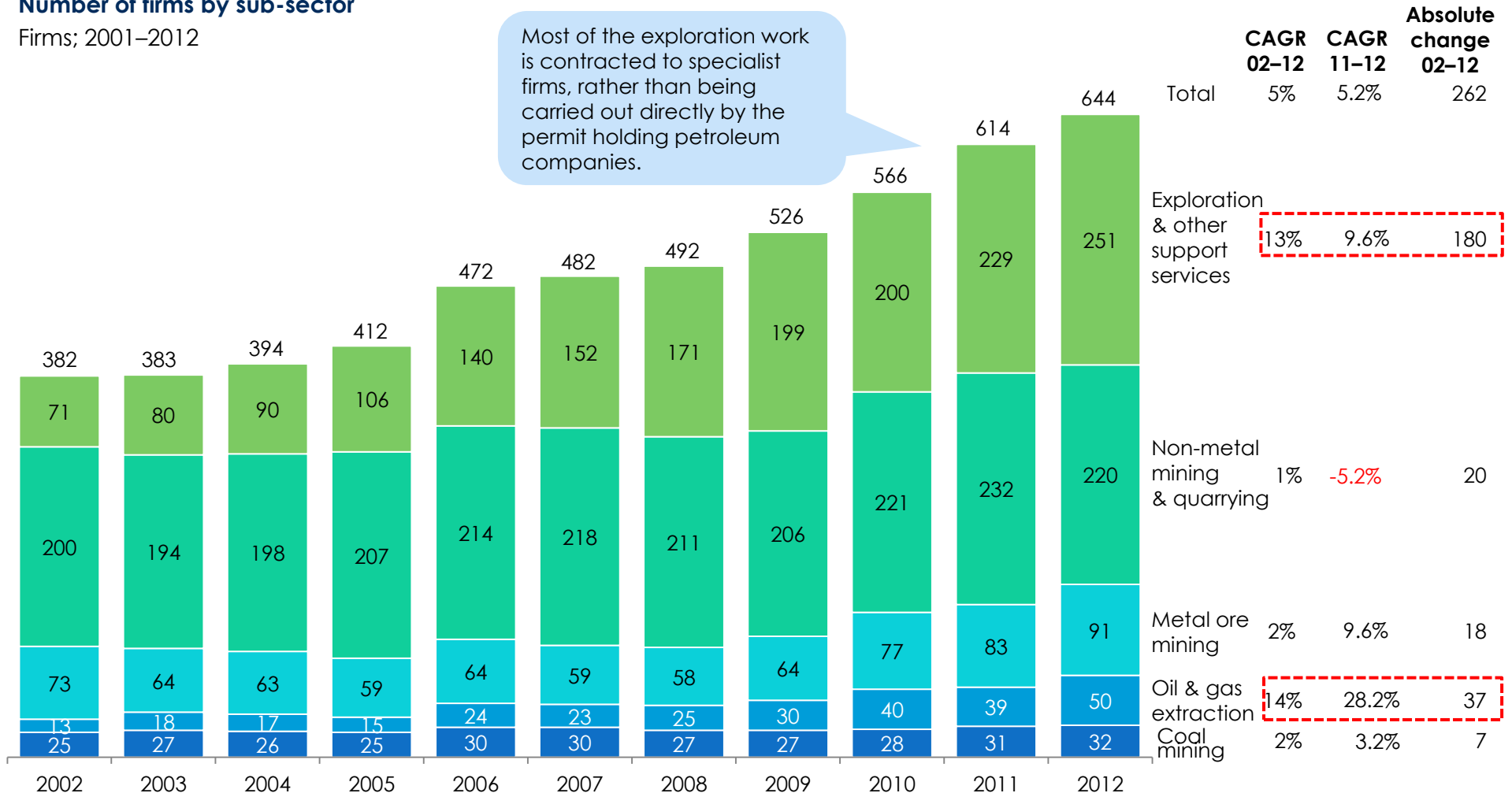
## Number of firms by sub-sector

The number of firms in the petroleum & minerals sector has grown, with 'exploration and other mining support services' a stand-out

### Number of firms by sub-sector

Firms; 2001–2012

Most of the exploration work is contracted to specialist firms, rather than being carried out directly by the permit holding petroleum companies.





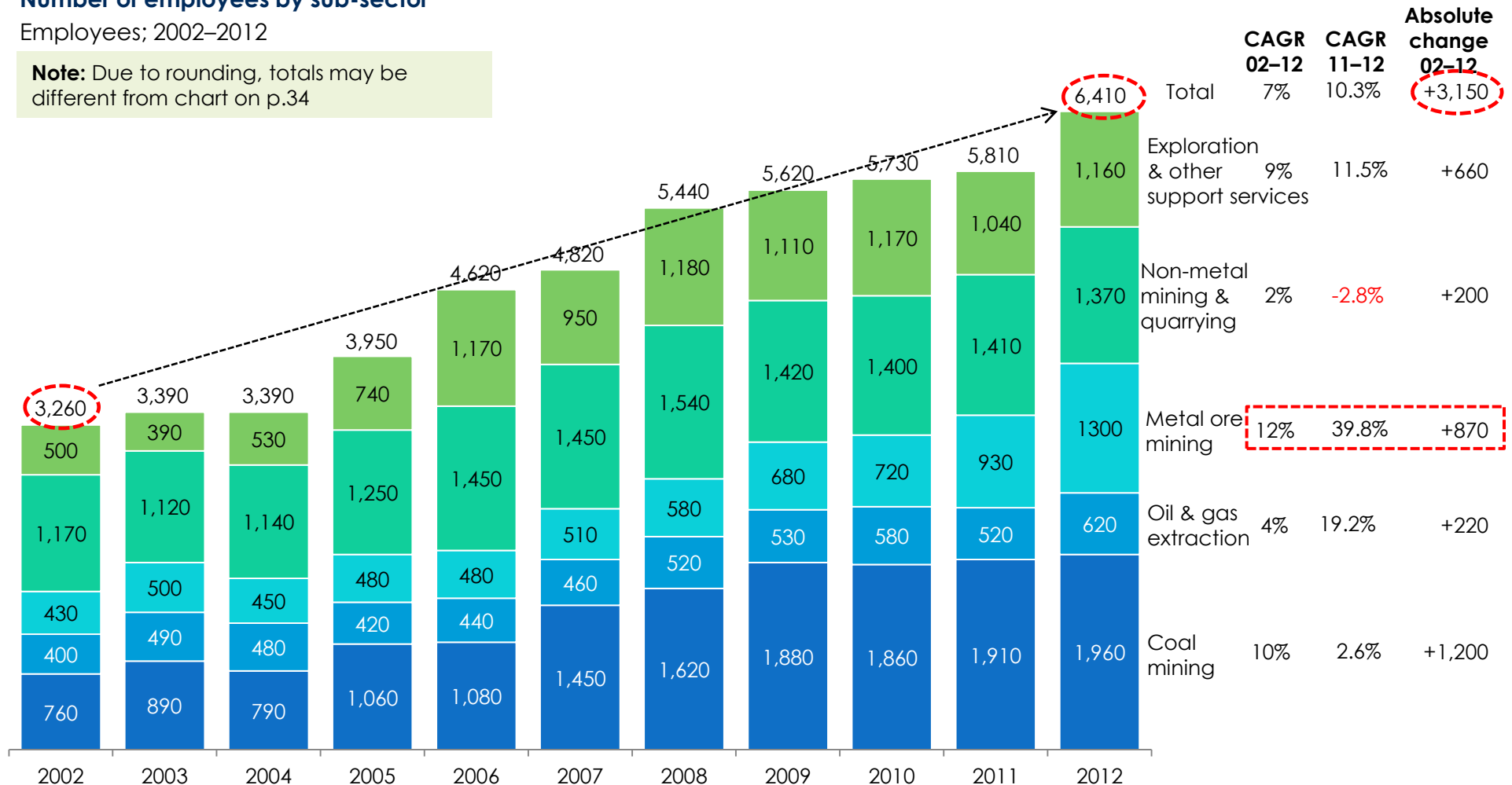
# Number of employees by sub-sector

Employment has doubled since 2002; employment growth has occurred across all sub-sectors

## Number of employees by sub-sector

Employees; 2002–2012

**Note:** Due to rounding, totals may be different from chart on p.34



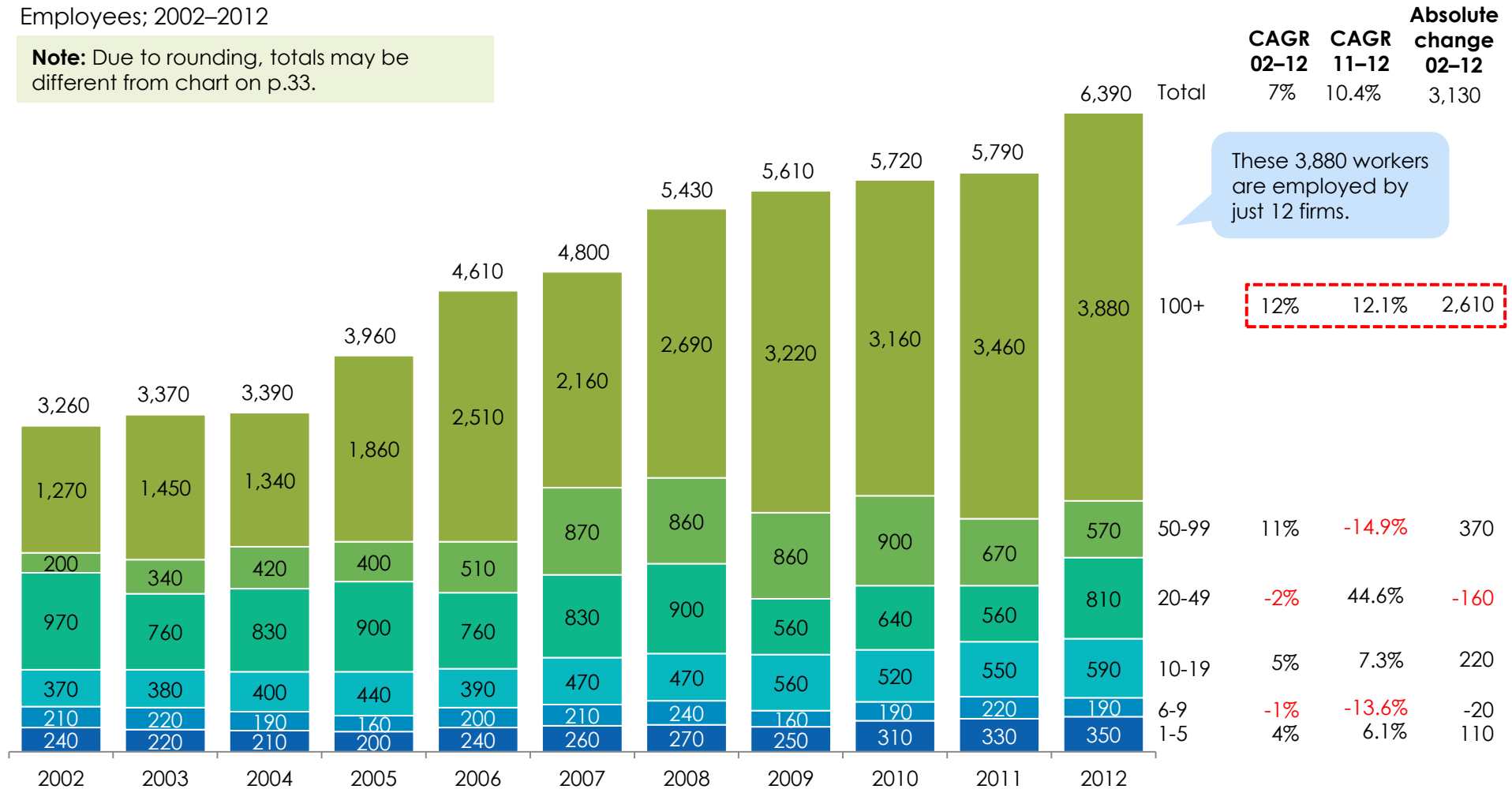
# Employment by firm size

Large firms account for most employment and have driven employment growth

## Number of employees by firm size

Employees; 2002–2012

**Note:** Due to rounding, totals may be different from chart on p.33.

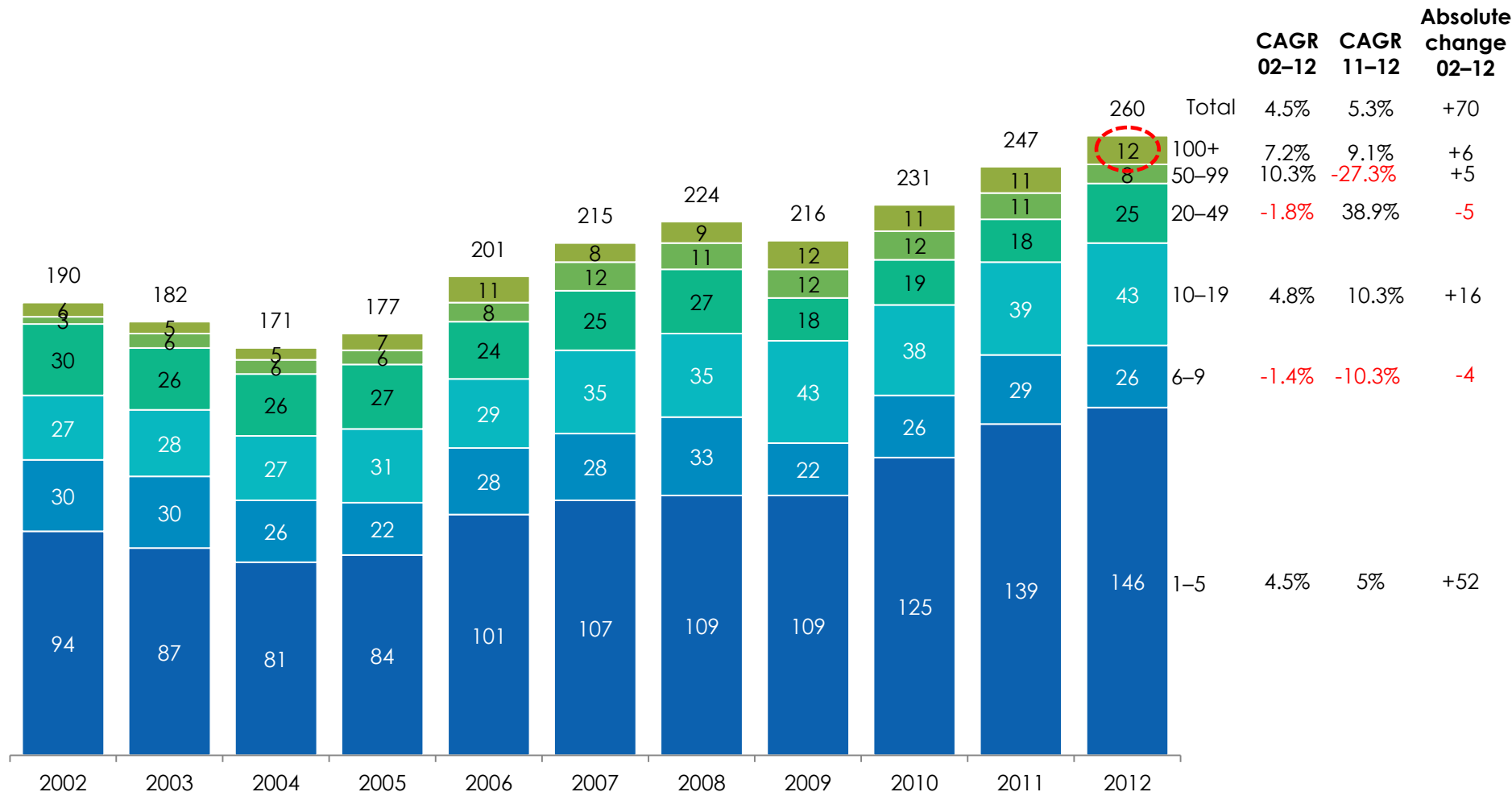


## Firms by employment size

The number of large firms (employing 100 plus workers) has doubled in the last ten years, from six to twelve

### Number of petroleum and minerals firms by employee numbers

Firms; 2002–2012; excludes firms with zero employees



Source: Statistics New Zealand, Business Demography Statistics (2012).

# Employment by region

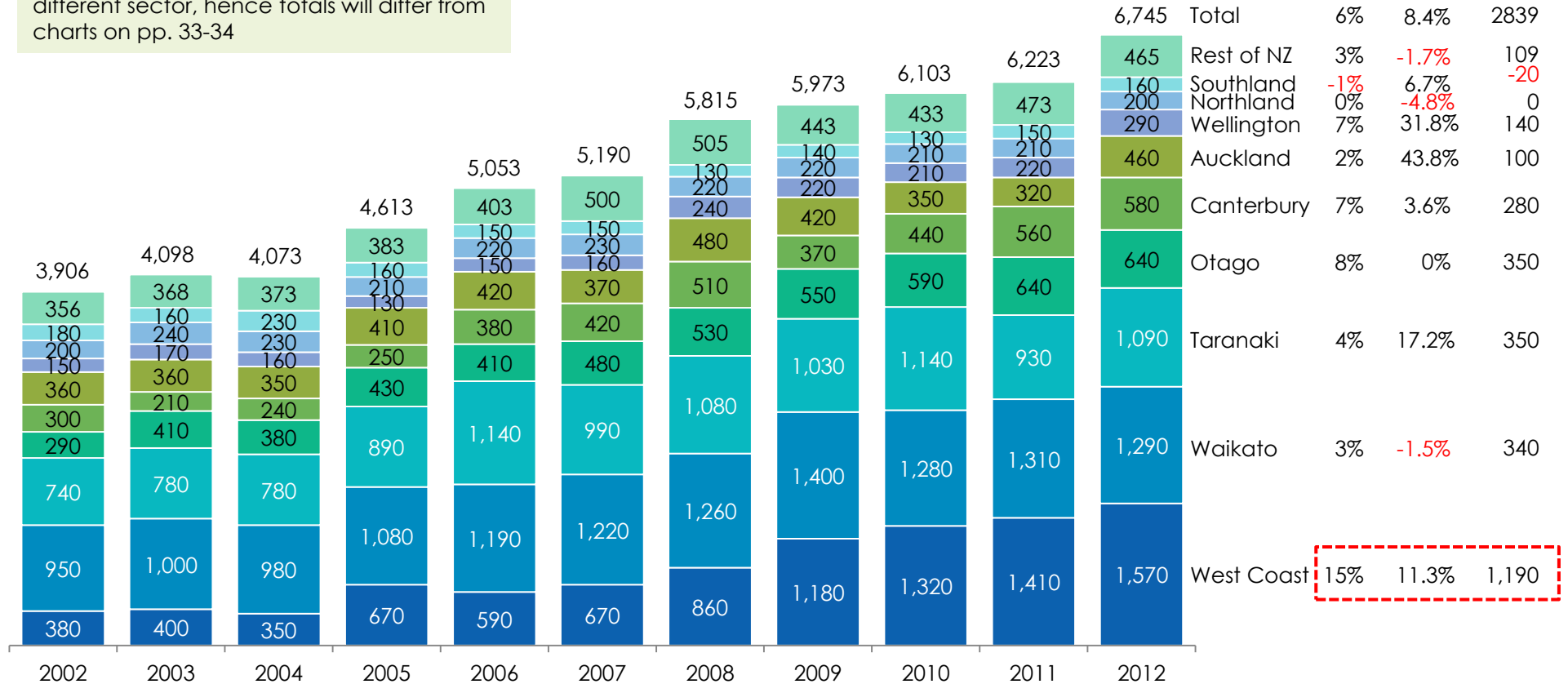
Employment has grown across all regions, with the West Coast a standout

## Number of employees by region

Employees; 2002–2012

**Note:** employment by region includes employees associated with the sector, but working for firms that may be classified to a different sector, hence totals will differ from charts on pp. 33-34

Employment in Taranaki is mainly in the petroleum sector. Employment in minerals is dispersed around a number of regions.



Note: Regions with less than 100 employees have been merged into 'Rest of NZ'  
 Source: Statistics New Zealand, New Zealand Business Demography Statistics (2012)

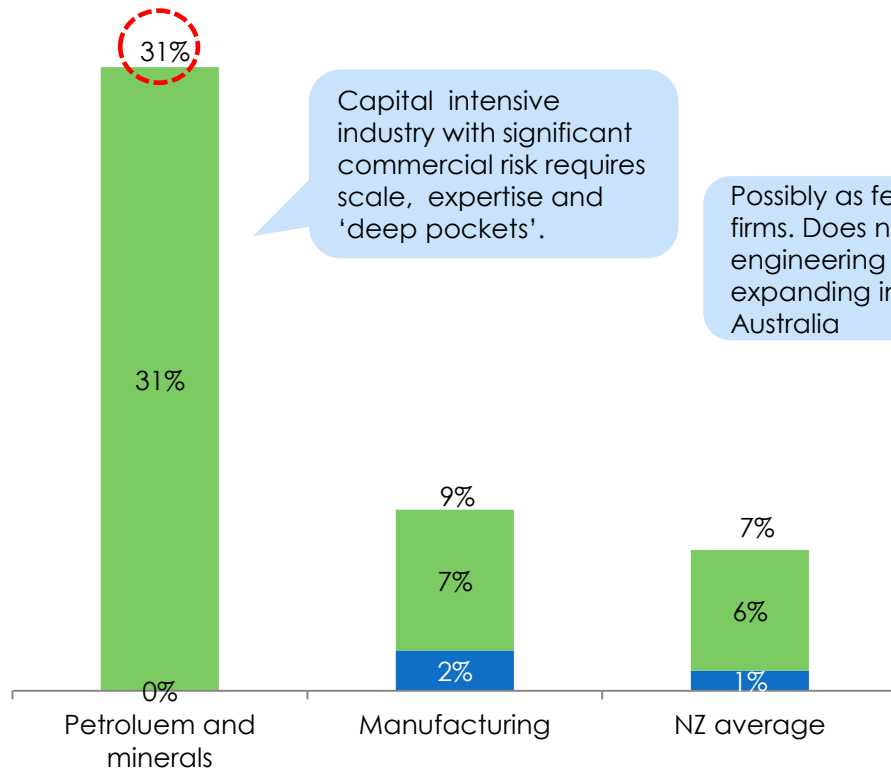
# Significant foreign investment

The New Zealand petroleum and minerals sector has attracted significant foreign investment; outward investment by NZ firms is minimal

## Petroleum and minerals firms with overseas ownership\*

% of firms; 2012

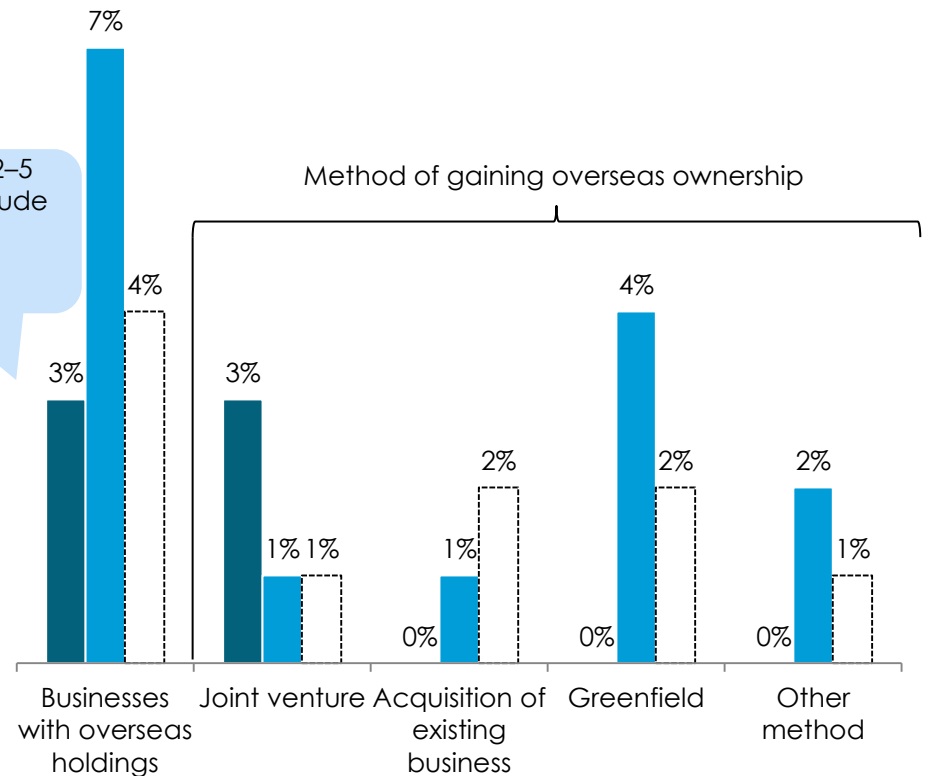
■ less than 50% foreign owned ■ more than 50% foreign owned



## Petroleum and minerals firms with overseas holdings\*

% of firms; 2012

■ Petroleum and minerals ■ Manufacturing □ NZ average



\*Note: Total survey sample is 35,976 firms with six or more employees; 105 of these firms were in petroleum and minerals.

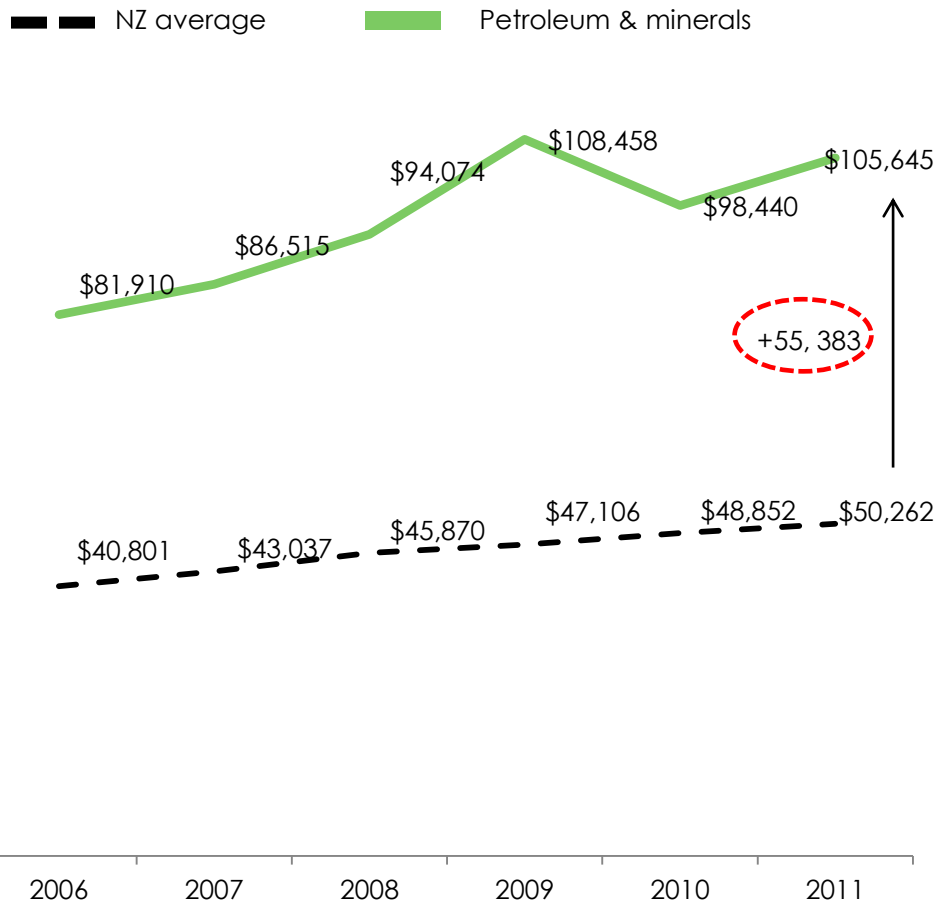
Source: Statistics New Zealand, Business Operations Survey (2012)

# Salaries and wages

Average salaries in the petroleum & minerals sector are over twice the New Zealand average

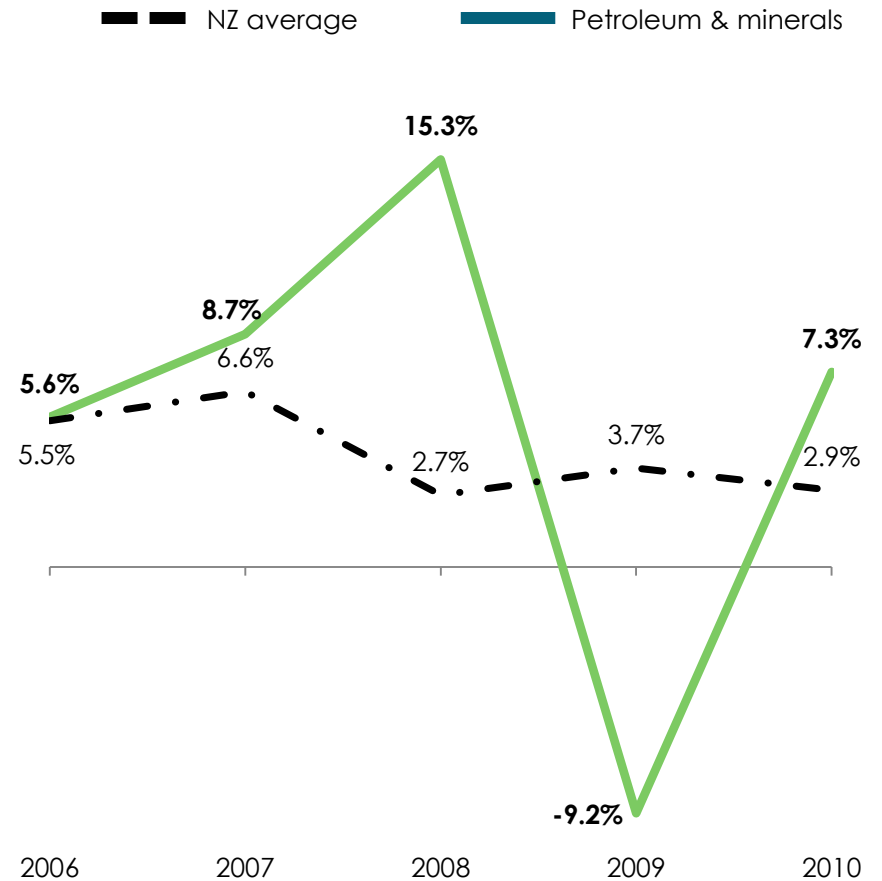
## Average salary/wages

NZ\$; 2006–2011



## Growth in average salaries/wages

% change; 2006–2010



Note: average wage is calculated by total salaries & wages paid divided by number of employees

Source: Statistics New Zealand, Annual Enterprise Survey



## Contribution to the wider economy



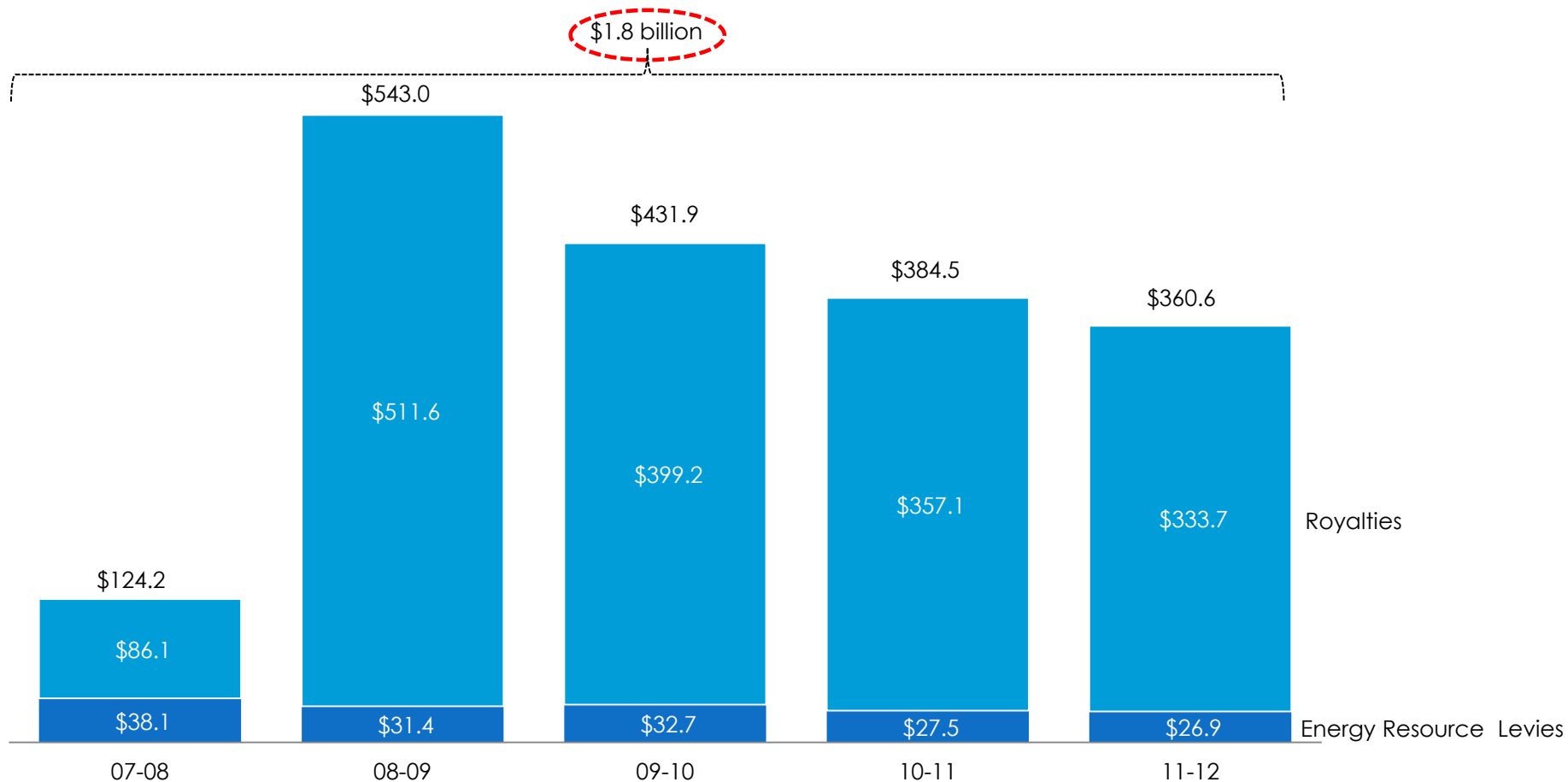


## Petroleum: royalties/energy resource levies

In the five years to 2012, a total of \$1.8 billion in royalties and energy resource levies from petroleum production was paid to the Crown

### Royalties and energy resource levies paid to the New Zealand Government

NZ\$m; 2007/08–2011/12

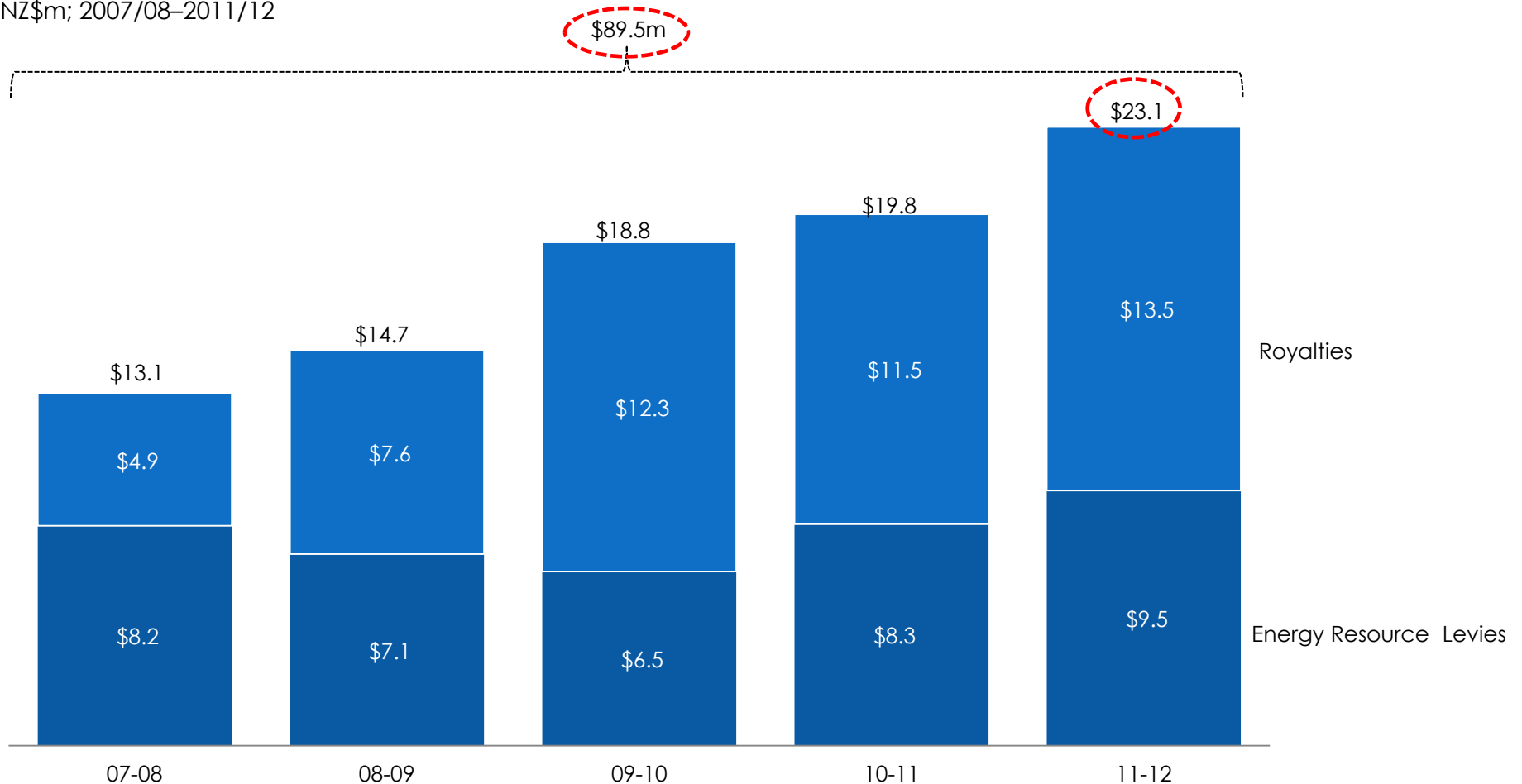


## Minerals: royalties/energy resource levies

In the five years to 2012, a total of \$89.5 million in royalties and energy resource levies from minerals production was paid to the Crown

### Royalties and energy resource levies paid to the New Zealand Government

NZ\$m; 2007/08–2011/12

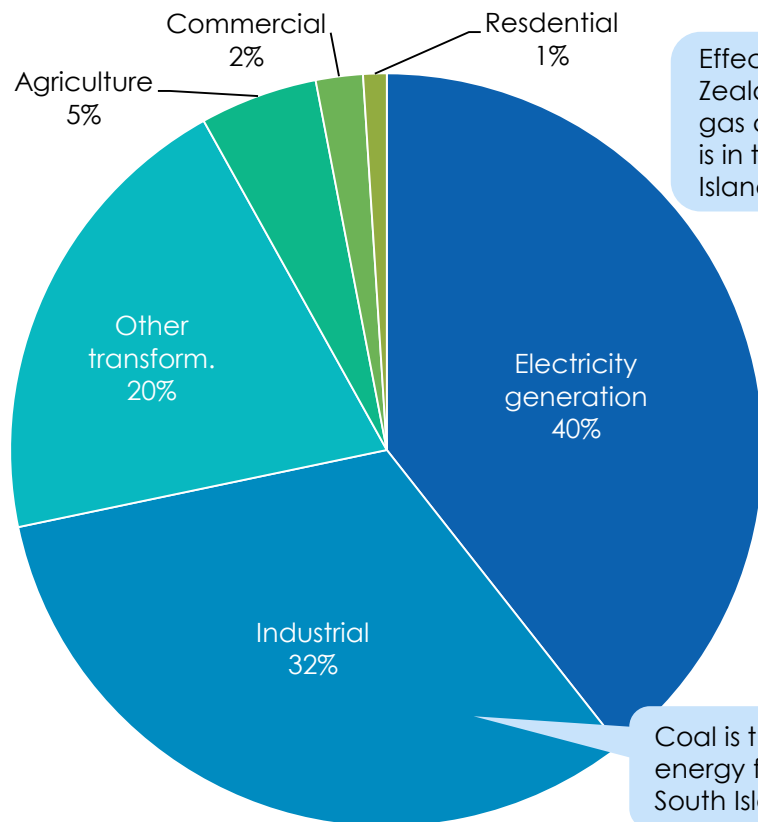


## Domestic use

Coal & gas are significant sources of energy for the economy; primarily to generate electricity and for industry; residential use is minor

### Domestic coal consumption by sector

Coal; 2011

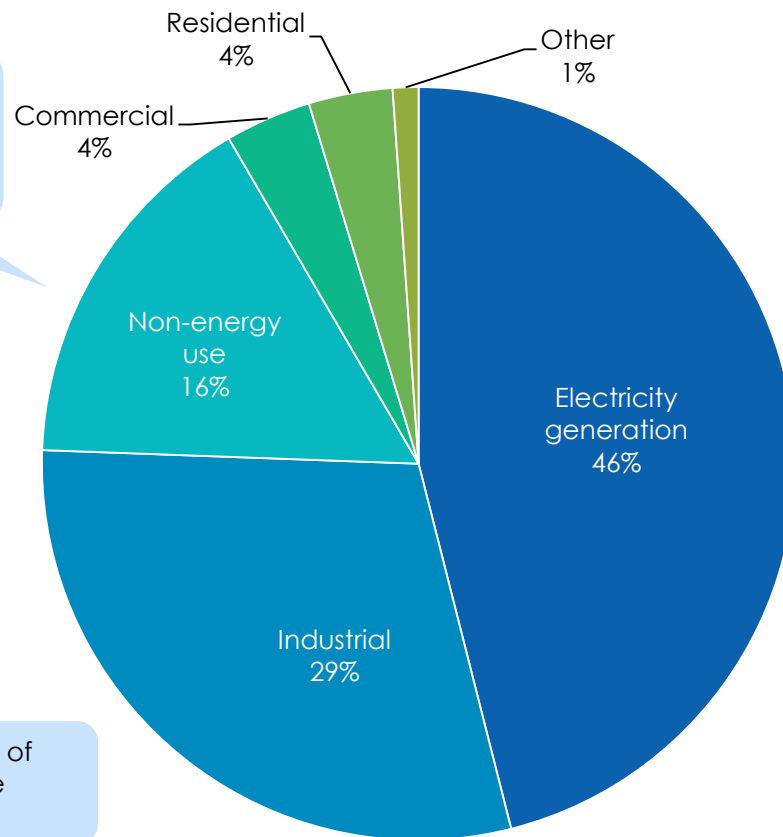


Effectively all New Zealand natural gas consumption is in the North Island

Coal is the major source of energy for industry in the South Island.

### Domestic natural gas consumption by sector

Gas; 2011



Note: Electricity generation includes co-generation natural gas 'other' includes agriculture, forestry, fishing & transport

Source: Ministry of Business, Innovation & Employment, New Zealand Energy Data File (2012)

## Impact on other sectors

The growth of the petroleum and minerals sector is driving growth (including internationally) in adjacent industries, e.g. engineering, as these examples show

### Brief profile of examples of suppliers and contractors to the petroleum and minerals sector; 2012, or as available

Firm	Ownership	Description
<b>Fitzroy Engineering Group</b> Revenue: \$119m (est 2012) Employees: 300 (est)	Dialog Systems (Asia) Pte Ltd (87%). NZ private 13%.	<ul style="list-style-type: none"> <li>Fitzroy Engineering Group offers complete and fully integrated solutions to industry specialising in complex, high quality, time sensitive engineering scopes. Sectors include Oil &amp; Gas – (onshore and offshore), petrochemical, power generation, energy exploration, pulp and paper, minerals and mining, and defence.</li> <li>Fitzroy have established a subsidiary company in Brisbane with 70 staff and are beginning explore opportunities in Papua New Guinea. Fitzroy also have connection back to Malaysia to major shareholder Dialog Systems.</li> <li>Exports estimated to be 45% of turnover.</li> </ul>
<b>Independent Technology Ltd</b> Revenue: \$28m (est 2012) Employees: 140 (est)	Purchased by listed Australian company LogiCamms Limited on 7/5/13 to be their centre of excellence for the petroleum sector in Australasia.	<ul style="list-style-type: none"> <li>ITL provide a range of engineering design and build solutions to the oil, gas and marine industries.</li> <li><i>Formed in 1988 by three employees of the former Natural Gas Corporation as a company specialising in design-and-build engineering for industrial process plants, particularly in the oil and gas sector, ITL has since achieved rapid business growth.</i> – stuff.co.nz, 8 May 2013</li> </ul>
<b>Quest Integrity Group</b> (formerly Digital Insight) Revenue: n/a Employees: n/a	Digital Insight was a remote digital video inspection start-up that originally started servicing Fonterra, then moved into the oil and gas market and developed a niche supplying its services to multinationals operating in Australia. Purchased by US based multinational Quest Integrity in 2012.	<ul style="list-style-type: none"> <li>Specialists in Remote Digital Video Inspection (RDVI)               <ul style="list-style-type: none"> <li><i>We are the ultimate industrial proctologists</i></li> <li><i>We implement RDVI inspection programmes</i></li> <li><i>We use remotely operated digital video cameras to inspect vessels, pipelines, turbines, tanks, generators etc</i></li> <li><i>We use retrieval tools to remove foreign debris from process systems</i> – Company website</li> </ul> </li> </ul>

## Impact on other sectors *continued*

### Brief profile of examples of suppliers and contractors to the petroleum and minerals sector; 2012, or as available

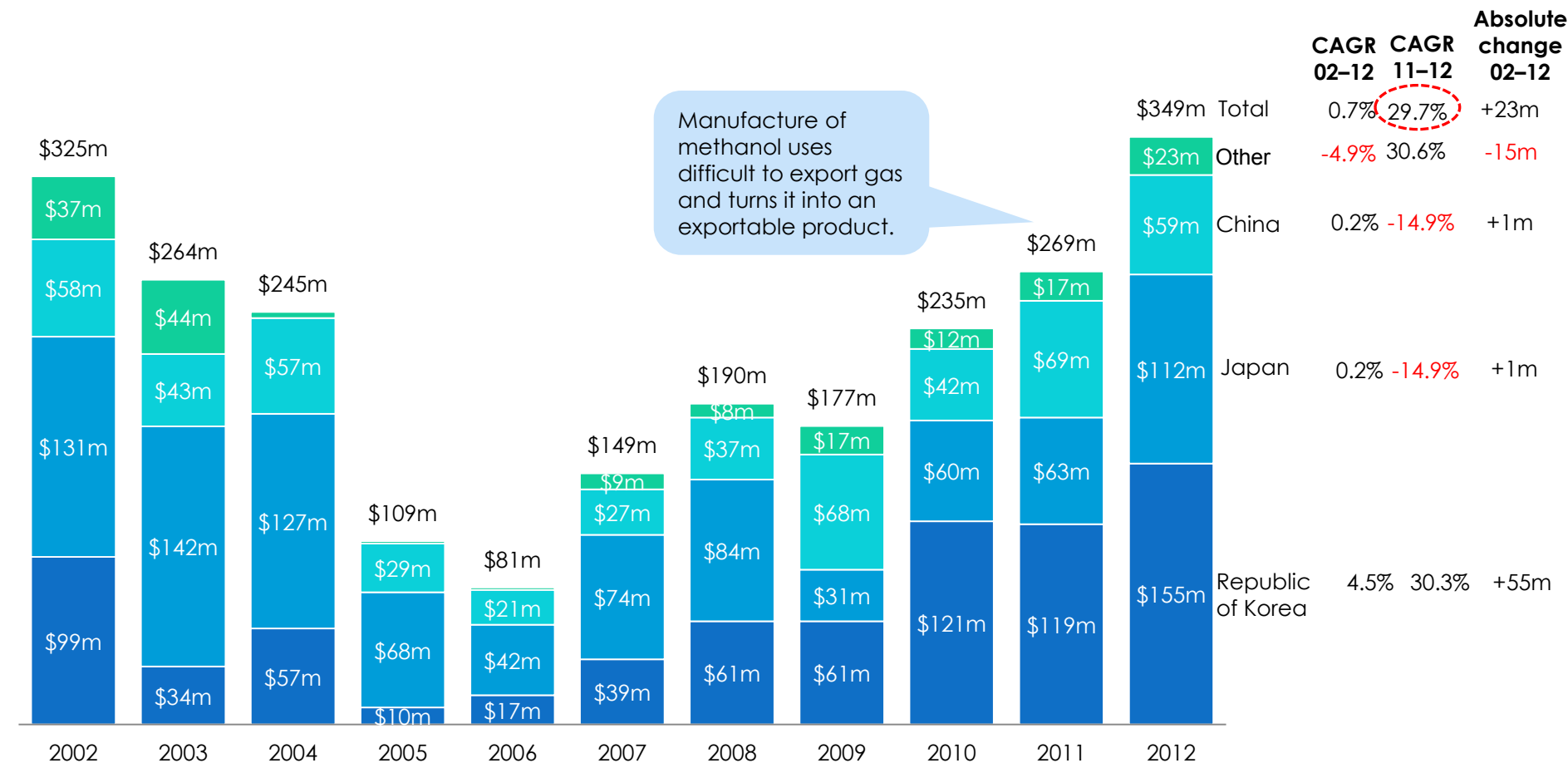
Firm	Ownership	Description
<b>JLE Holdings Ltd</b> Turnover: 30m (est. 2012) Employees: 140	Private.	<ul style="list-style-type: none"> <li>Former New Plymouth based electrical and mechanical contractors with a subsidiary company in Australia and active in the oil and gas market in Papua New Guinea. Head office now in Auckland.</li> </ul>
<b>ECL</b> (Engineering Control Ltd) Turnover: n/a Employees: n/a	Private.	<ul style="list-style-type: none"> <li>ECL are automation system integrators who have grown their business on the back of oil and gas sector work in New Zealand and Australia.</li> </ul>
<b>ARANZ Geo</b> (Private) Revenue: \$11m (est 2011) Employees: 80 (est)	Private.	<ul style="list-style-type: none"> <li>Core product is the Leapfrog® 3D geological modelling software for the mining, hydrogeology and geothermal industries.</li> <li>ARANZ Geo has a 50-strong Christchurch based team and a further 35 staff located across a network of local support offices... Around 98% of the company's software is exported.                – scoop.co.nz, March 2013.</li> </ul>
<b>Amtec Engineering Group</b> Turnover: \$20m (est. 2012) Employees: 80	Private.	<ul style="list-style-type: none"> <li>Heavy engineering and fabrication company. Group includes Drilling Fluid Equipment NZ Limited, who have worked on oil and gas drilling projects in Australia and the Middle East.</li> </ul>
<b>Energyworks Ltd.</b>	Private.	<ul style="list-style-type: none"> <li><i>Energyworks Ltd constructs and maintains everything from the Oil &amp; Gas Well Head up to and including Power Stations including: Well Head Piping &amp; Equipment, Gathering pipelines, Production Stations, Export Pipelines, Metering Stations, Power Stations and Storage Facilities.</i></li> <li><i>Energyworks also has a multi-discipline project management and construction team located in Queensland, Australia, specialising in the oil and gas sector</i>                – www.energyworksgroup.com.au                – www.energyworks.net.nz</li> </ul>

# Methanol exports

New supplies of gas have revitalised production and export of methanol

## Export value of New Zealand methanol by importing country

US\$m: nominal prices; 2002–2012



## Industry comment

### Industry commented on the wider benefits to the economy

- *Canadian firm Methanex is investing \$80 million to restart its Waitara valley methanol plant, which has lain idle since production ceased in 2008, due to lack of a contracted gas supply. As well, Methanex will add capacity at the Motunui site by increasing distillation to add another 200,000 tonnes annually. At current market prices the value of methanol may top a billion dollars annually.*
  - Sourced from stuff.co.nz, 7 March, 2013 .
- *You need to mention Methanex and its impact on New Zealand. They have created a market for gas that would otherwise be stranded, and which enables gas production to drive significant export growth for New Zealand. The Methanex story is powerful. This is a redundant asset that has been brought back to life. In the New Zealand context this is a huge industrial development.*
  - CEO, Industry body.
- *The benefit of Methanex is that it gives New Zealanders a cornerstone demand for new gas supplies. This does de-risk for exploration companies, in that there actually is a local market rather than having to worry about building export facilities.*
  - Industry leader.
- *Greater certainty of gas supply has enabled other industries to invest and innovate, with a positive impact on both regional and national economies. An example is South Taranaki urea manufacturer Balance, who have built production on reliable gas supply, meaning New Zealand has to import less. Nationally we are importing a lot of fertiliser, so the more we can produce domestically, the less the balance of payments are affected.*
  - CE, Economic Development Agency

## Industry comment *continued*

### Industry commented on the wider benefits to the economy

- *[we] had an expansion of an existing oil plant, added a gas plant facility to it this year. It was about a \$40 million dollar Kiwi job. I can tell you that \$5 million of that was in manufactured parts from other parts of the world, mainly Canada, big vessels and things like that. The other \$35 million was spent right here in New Zealand for manpower, for manufactured goods here, a lot of the vessels were built right here in New Plymouth. So a great proportion, I'd say over 90% of what we are spending on these big capital projects, is earmarked for and stays right here in New Zealand.*
  - CEO, petroleum exploration and extraction company.
- *These firms [suppliers and contractors] grew up in Taranaki, and are now exporting trans-Tasman and beyond. Many of these companies treat New Zealand and Australia as one market, so they are now servicing the Australian market out of New Plymouth.*
  - CE, Economic Development Agency.

#### **Methanol and it's uses**

- *Methanol is a liquid petrochemical comprised of four parts hydrogen, one part oxygen, and one part carbon. It is a naturally occurring substance that can be made from both renewable and non-renewable fossil fuels containing carbon and hydrogen. Methanex manufactures methanol commercially in a catalytic process using natural gas as the principal feedstock*
- *From recyclable plastic bottles to pharmaceuticals, polyester to paint, methanol is in everybody's life. Methanol is used as a feedstock in the production of chemicals such as acetic acid and formaldehyde, and in products like adhesives, foams, plywood subfloors, solvents and windshield washer fluid. It is also used in the manufacturing of methyl tertiary butyl ether (MTBE), a clean-burning gasoline component.*
- *Methanol is increasingly being used to purify waste water. It is also a convenient fuel for fuel cells being developed for cell phones, portable computers and small scale transportation applications such as commuter scooters.*
  - Sourced from Methanex corporate website; <http://www.methanex.com/education/english/main.html>





## EXPORTS

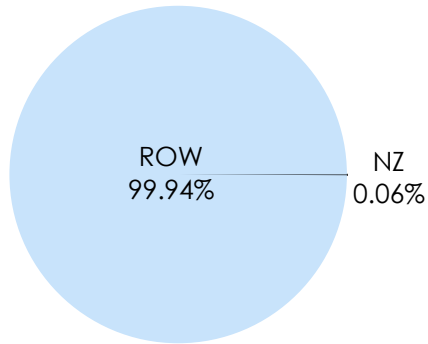
# Global production

In global terms, New Zealand is a minor producer of petroleum and minerals

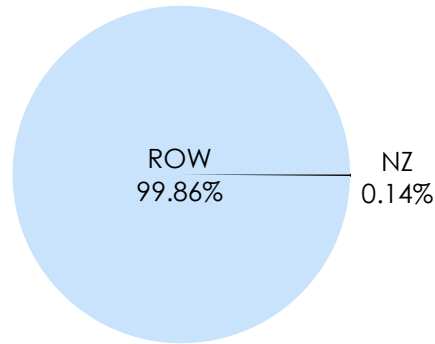
## New Zealand share of global production versus 'rest of world' (ROW)

Global volume; 2012

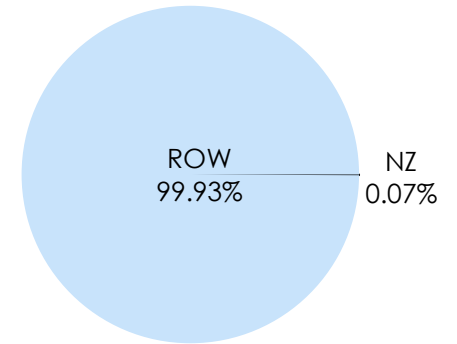
### Coal



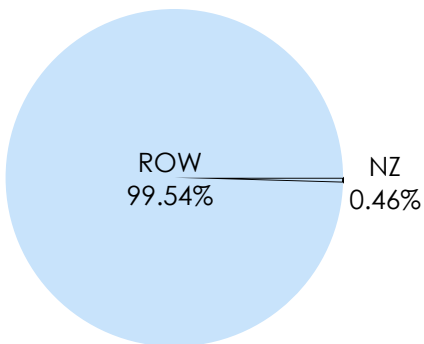
### Gas



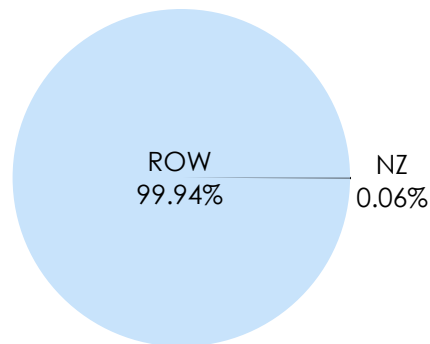
### Crude oil



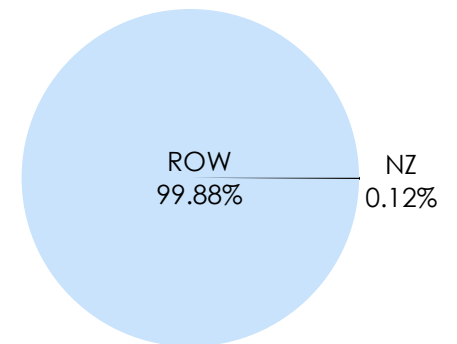
### Gold



### Silver



### Iron ore

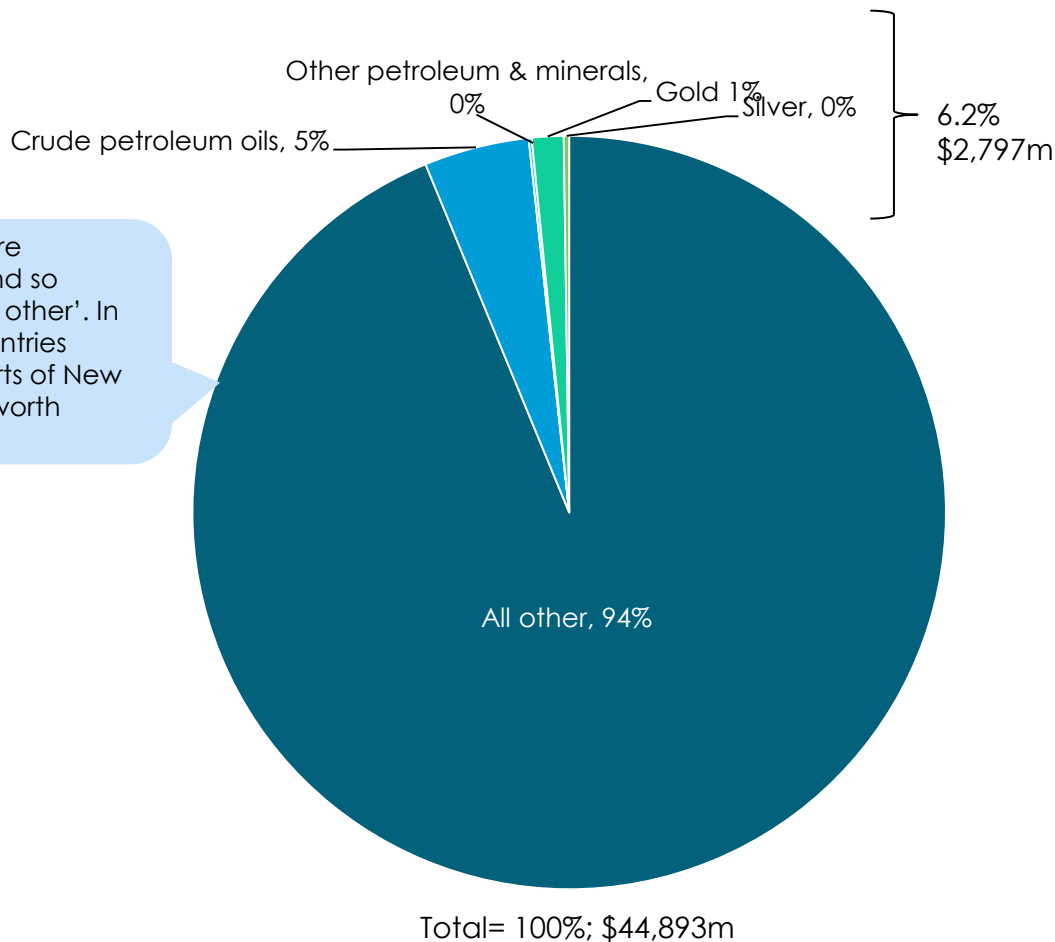


## New Zealand exports

In New Zealand terms, the petroleum and minerals sector makes a significant contribution to New Zealand's merchandise exports

### Petroleum and minerals exports as a percentage of all exports

% exports value, 2012



#### Notes

- The value of coal exports is confidential from 2008.
- The concordance used to allocate exports to sectors places gold and silver in the metals manufacturing sector.
- To provide a more complete picture of New Zealand's exports of petroleum and minerals, gold and silver exports are included in this and following charts.

# Exports

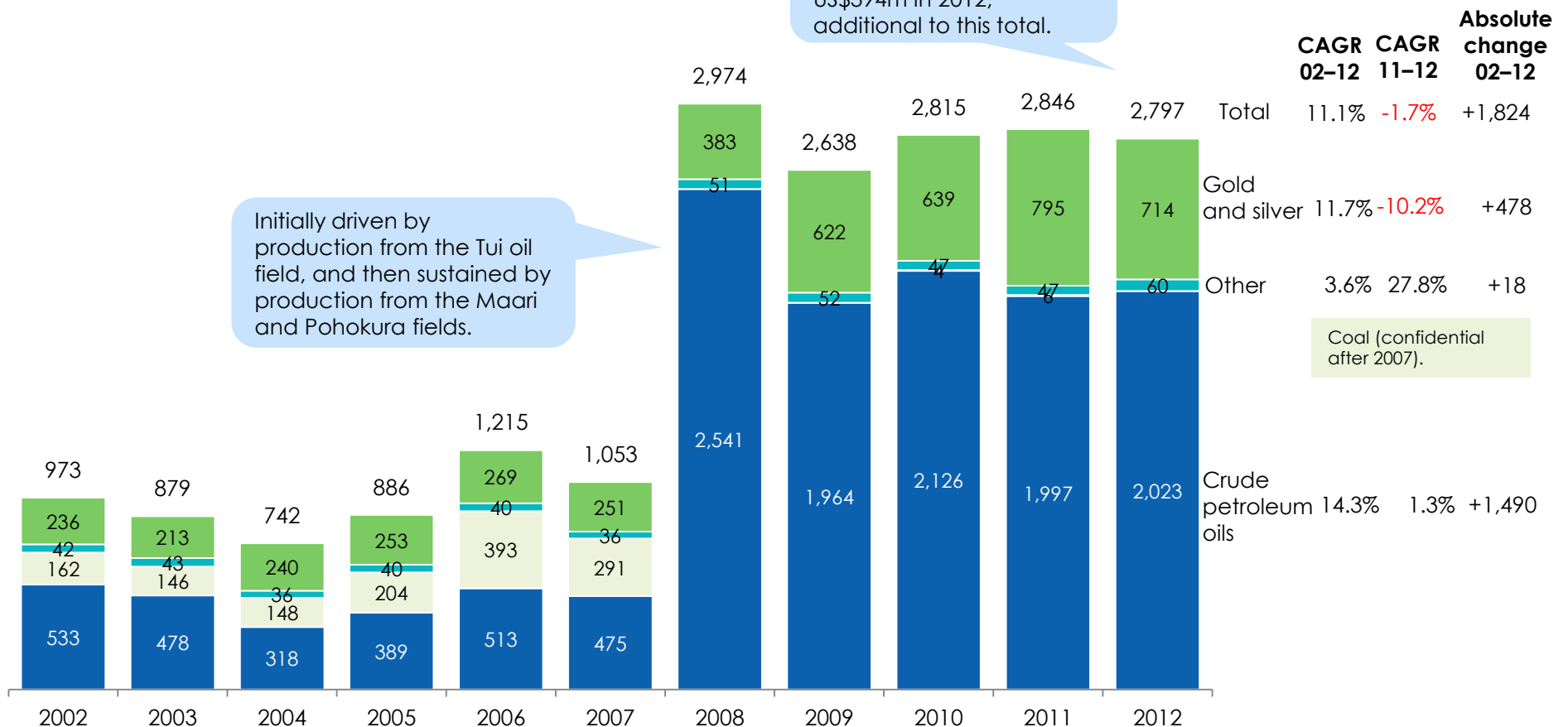
Exports from the petroleum and minerals sector have tripled since 2002, driven by a surge in crude petroleum in 2008

## Export value of petroleum and minerals

NZ\$m; 2002–2012

Initially driven by production from the Tui oil field, and then sustained by production from the Maari and Pohokura fields.

Other countries report imports of New Zealand coal worth a total of US\$394m in 2012, additional to this total.

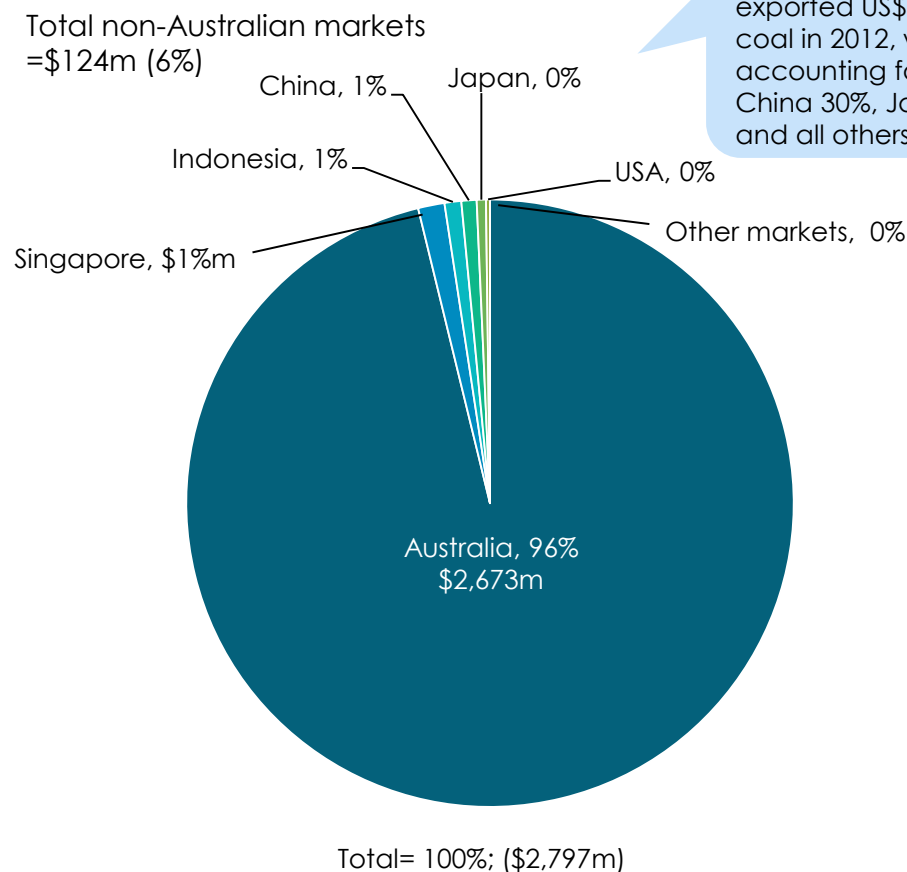


## Export destinations

Australia imports 96% of New Zealand's petroleum and minerals exports; oil and gold are New Zealand's two single largest exports to Australia

### Petroleum and minerals exports by market

% of petroleum and minerals exports; 2012



### Top ten goods exports to Australia by value

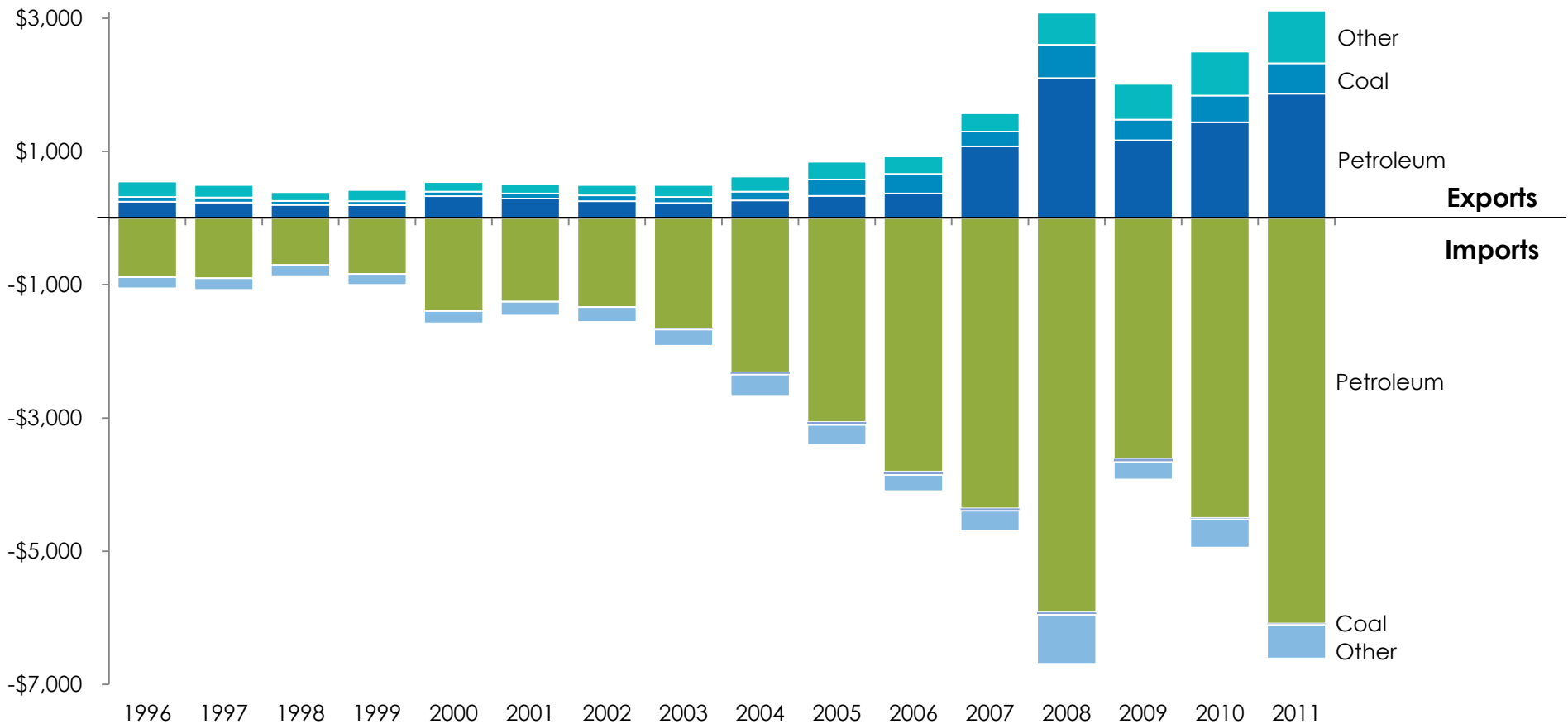
NZ\$m: 2012

	Description	Value
1	Crude petroleum oils	\$1,740m
2	Gold	\$574m
3	Wine	\$382m
4	Cheese	\$226m
5	Food preparations, not elsewhere specified.	\$198m
6	Sawn or chipped wood of thickness 6mm and over	\$166m
7	Non-crude petroleum oils, waste oil, and biodiesel	\$163m
8	Plastic containers	\$138m
9	Insecticides, rodenticides, herbicides	\$132m
10	Silver	\$124m

## Imports vs. exports

Despite the strong growth in exports, New Zealand still has a substantial trade deficit in the sector, driven by petroleum imports

Petroleum & minerals, exports vs. imports  
US\$M; 1996-2011



Note: Comtrade uses global import data which includes costs including insurance and freight  
Source: UN Comtrade database; 2012

## Commentary: oil exports and imports

New Zealand exports high quality crude oil which fetches a premium, and imports cheaper foreign oil for refining

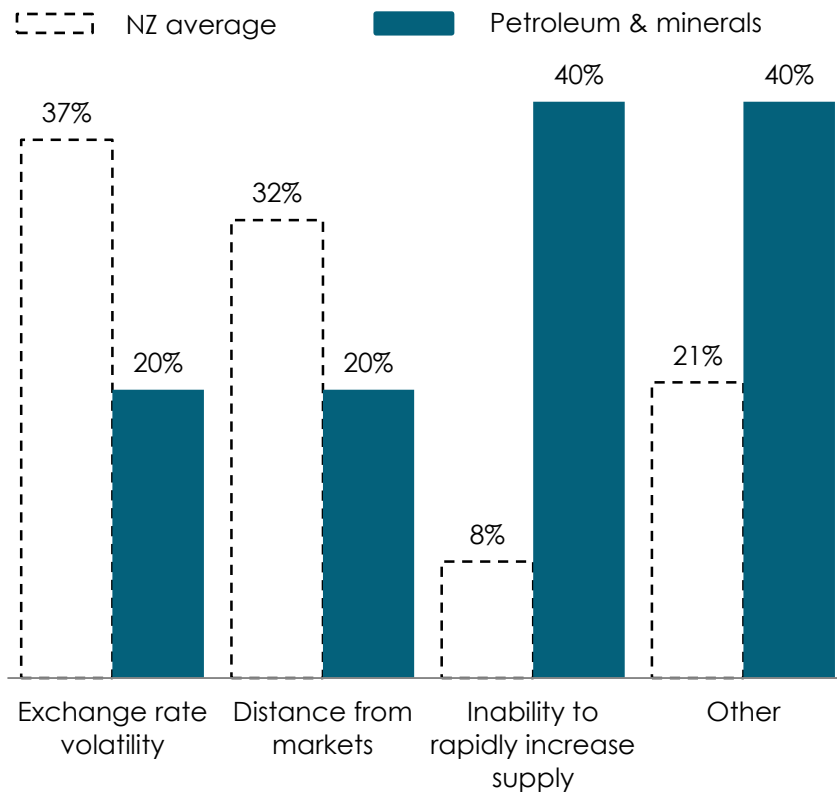
- *New Zealand is a net importer of oil – although this should be interpreted with care – because almost all domestically produced New Zealand oil is exported. This is because New Zealand crude oil is very high quality (low density and sulphur content) and fetches a premium price on the international market. Cheaper foreign oil is imported to refine at the Marsden Point refinery. Oil self sufficiency peaked in 1997 at 52%. This was due to a peak in production at the Maui oil (and gas) field. Since then, self-sufficiency fell until 2007, when the Tui and Pohokura fields started producing.*
  - Source: Energy in New Zealand, 2013. Available from [mbie.govt.nz](http://mbie.govt.nz)

## Leading barriers for existing and potential exporters

Key barriers to export growth are 'inability to rapidly increase supply' and 'other'; exchange rate less of a barrier than New Zealand average

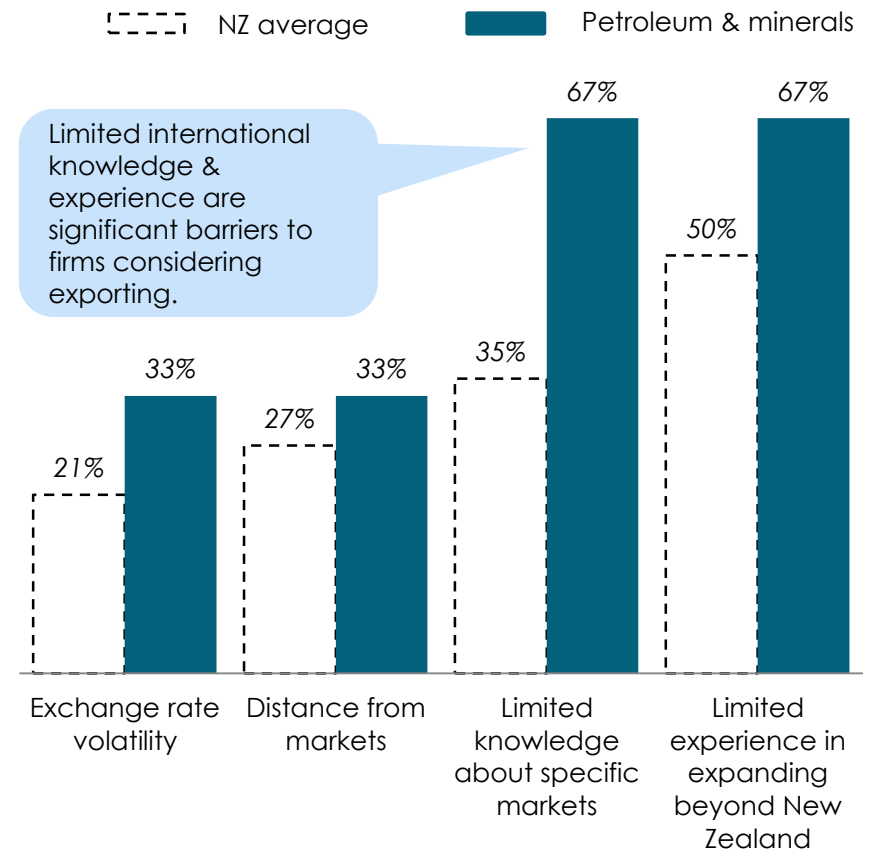
### Percentage of current exporting firms reporting the following factors as barriers to exporting

% of firms; 2011



### Percentage of firms considering exporting reporting the following factors as barriers to exporting

% of firms; 2011







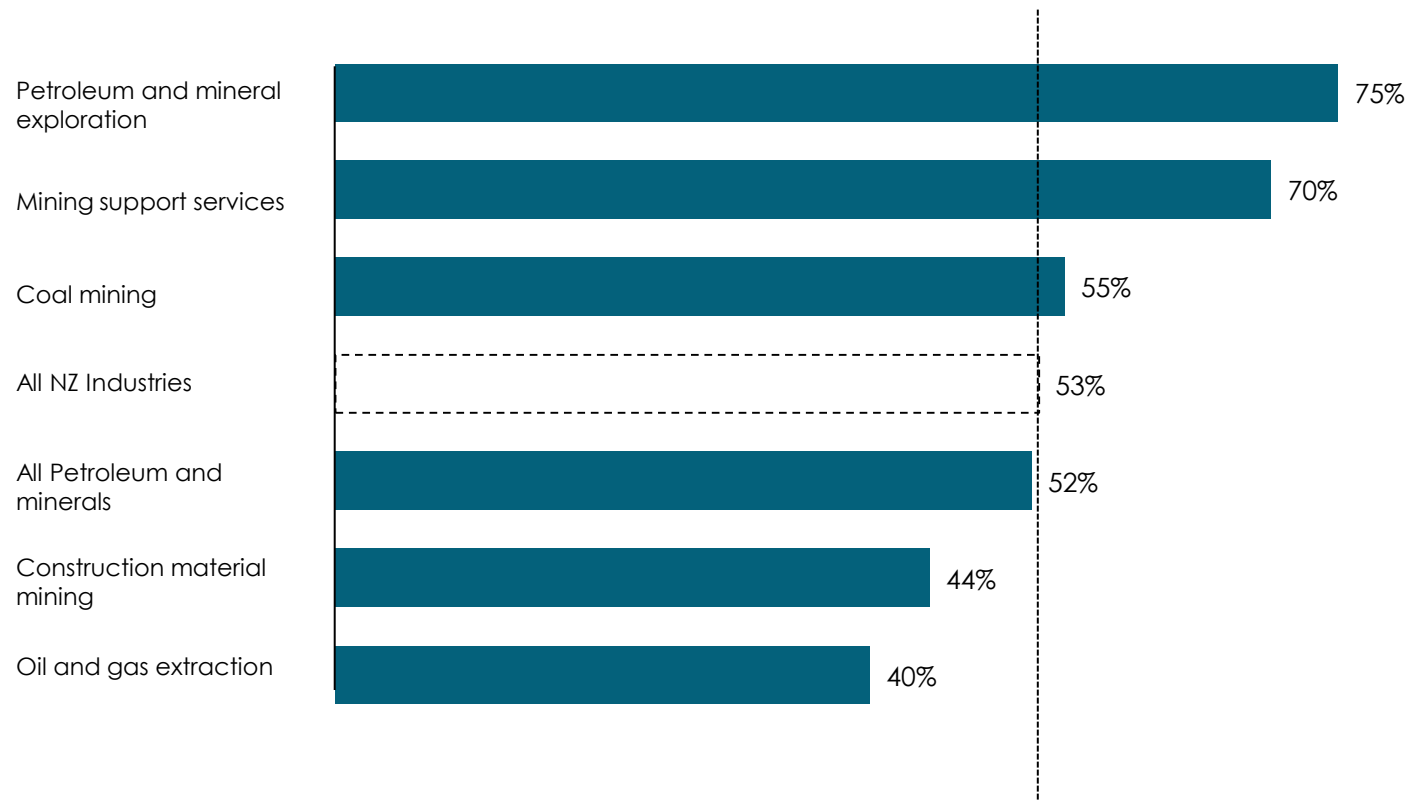
## SKILLS

## Level of sector workforce qualifications

52% of petroleum and minerals workers have a post-school qualification, with the 'exploration' sub-sector the most qualified

### % of workforce with post-school qualifications

2009/10

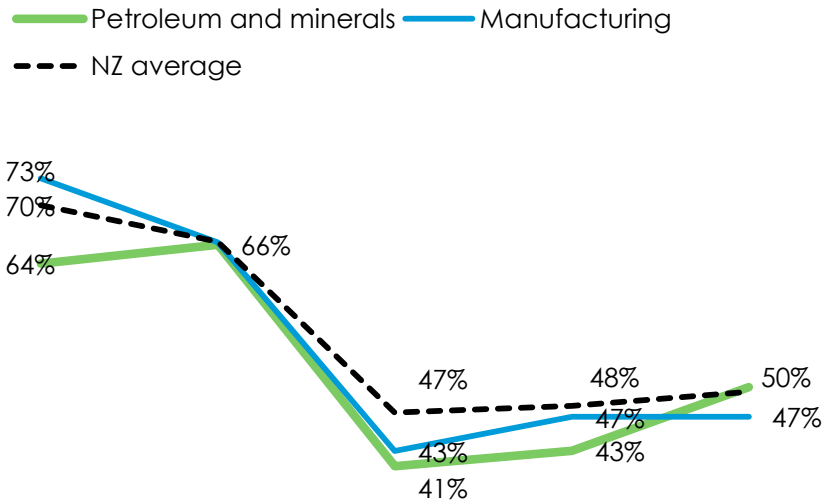


## Skills availability

Ease or difficulty of recruitment in petroleum and minerals is similar to the economy as a whole; firms report decline in perceived quality of labour

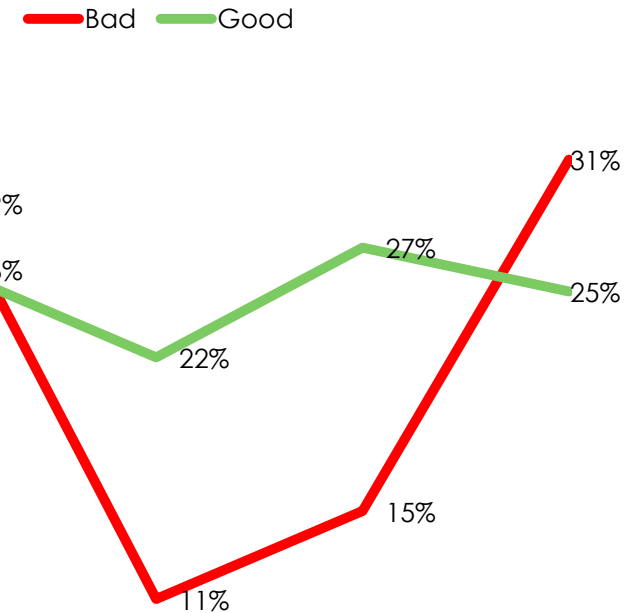
### Firms reporting that it was hard to fill vacancies for at least one occupational group

% of firms; 2007–2011



### Percentage of petroleum and minerals firms reporting each perception of labour

% of firms; 2007–2011



## Industry comment:

### Industry commented on shortages of skilled labour

- *There's some great guys around but you run out of good guys on the list very quickly and if they are unavailable or off on another job we do struggle with manpower issues here. We could certainly use and would encourage more Kiwis to get into these businesses. We need to let local Kiwi kids in high school know what a great industry this is... it's the most highest paying business there is in the country and we are short of skilled guys that could simply go to university for a few years, get an engineering or electrical engineering degree, a geology degree, a geophysics degree and come out and start making \$100 grand in their first year out of school. It seems like a lot of Kiwis just don't know that yet.*
  - CEO, petroleum and exploration company.
- *You go back a couple of years when everything was booming, it was very hard to attract skills to New Zealand and to get the New Zealand people to want to stay for any length of time. So you were then having to try and train up your own. But when you did train up your own, you were losing them as well. So you could say the skills level wasn't as good as you'd hoped it to be.*
  - Senior executive, minerals sector
- *As a nation we must remember that vocational skills drive these industries. Higher level project managers can be based anywhere in the world to do the design and clever stuff, but it's the actual people who bolt it all together on site that make it happen. Staff need to be experienced working with hydrocarbons because of the health and safety considerations. Those without knowledge and experience in this environment can pose a risk – it's simply not a case of grabbing anyone with a welding kit at home and applying their enthusiasm to a global industry.*
  - CE, Economic Development Agency



## INNOVATION

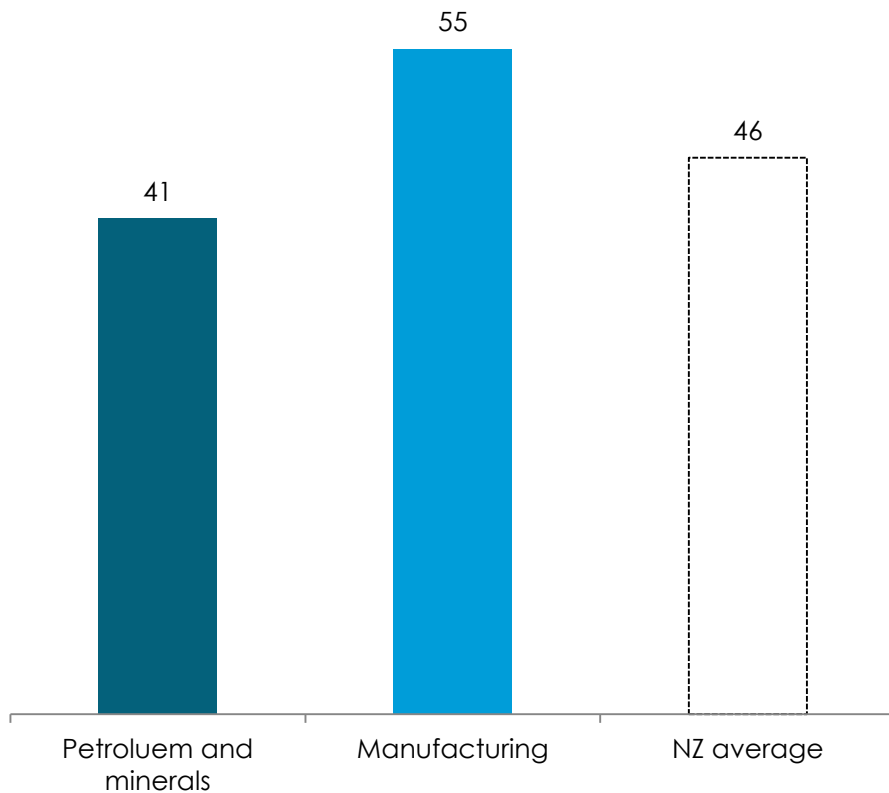


# Innovation

The sector's innovation activity is marginally below the New Zealand average

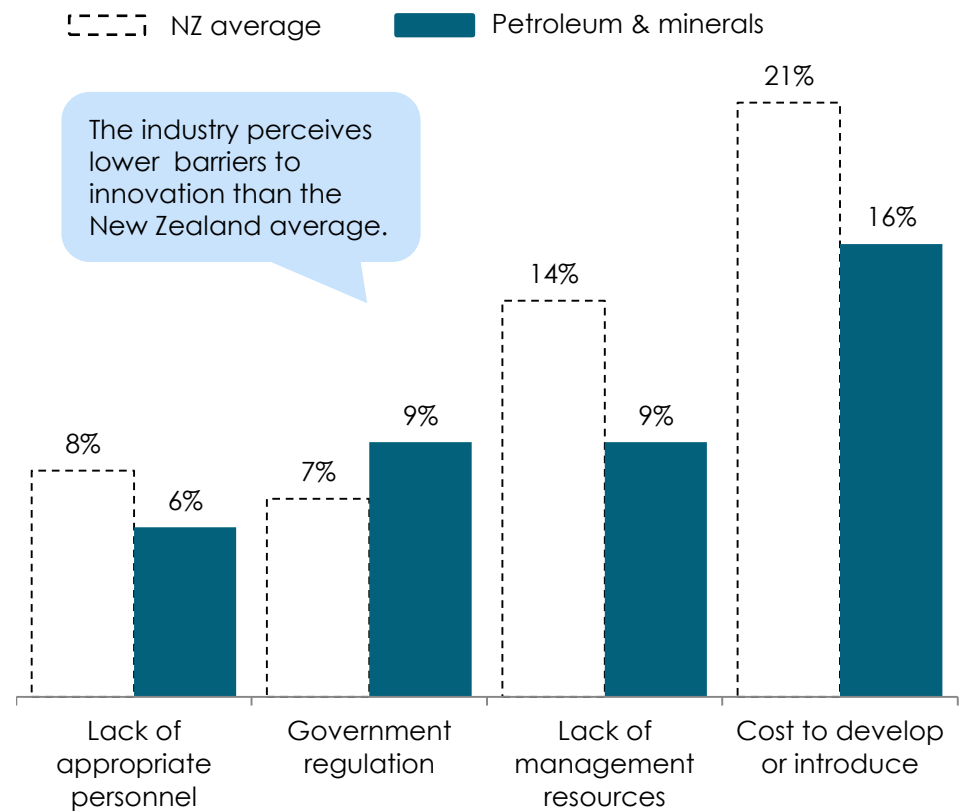
## Petroleum and minerals firms reporting innovation activity

% of firms; 2011



## Petroleum and minerals firms reporting barriers that hampered innovation to a high degree

% of firms; 2011



Petroleum and minerals sample: 96 firms employing 6 or more people ; treat as directional.  
Source: Statistics New Zealand, Business Operations Survey (2012)

## Investment in expansion and R&D

Half of petroleum and minerals firms invested in expansion in 2012 and a quarter invested in R&D, with R&D expenditure averaging \$675,000 per firm

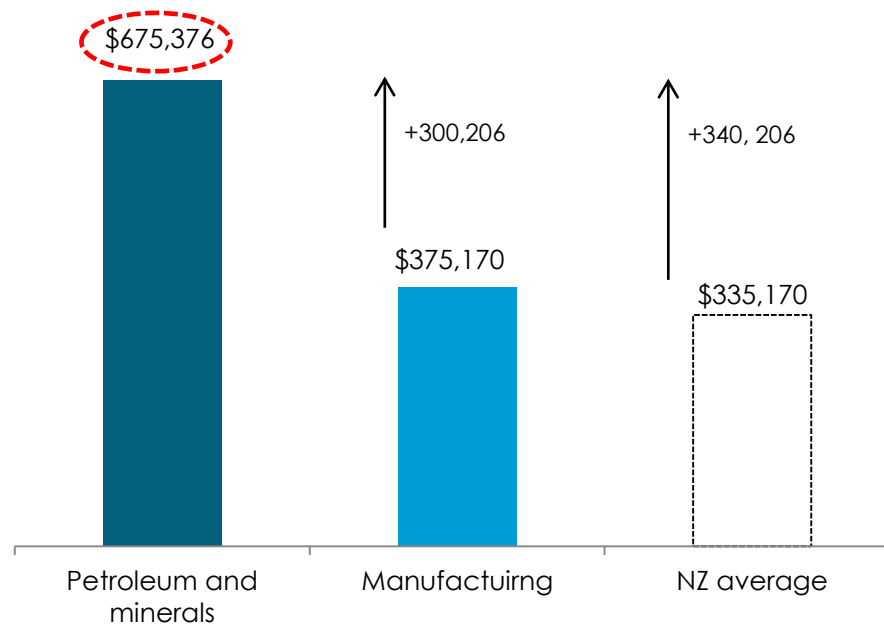
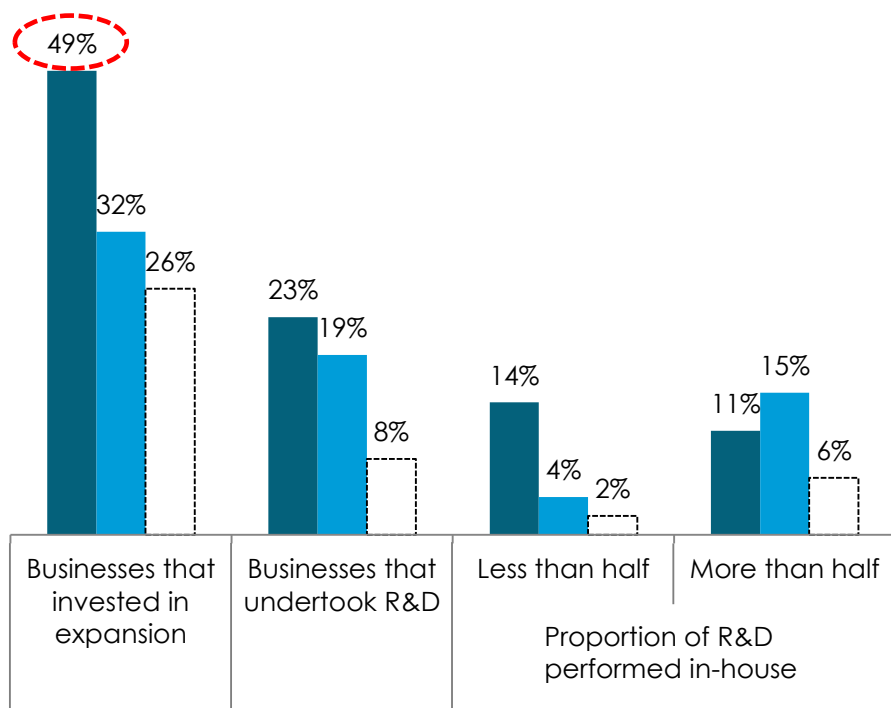
### Investment in expansion and R&D

% of firms, 2012

### R&D expenditure per firm

NZ\$; 2012

■ Petroleum and minerals ■ Manufacturing □ NZ average



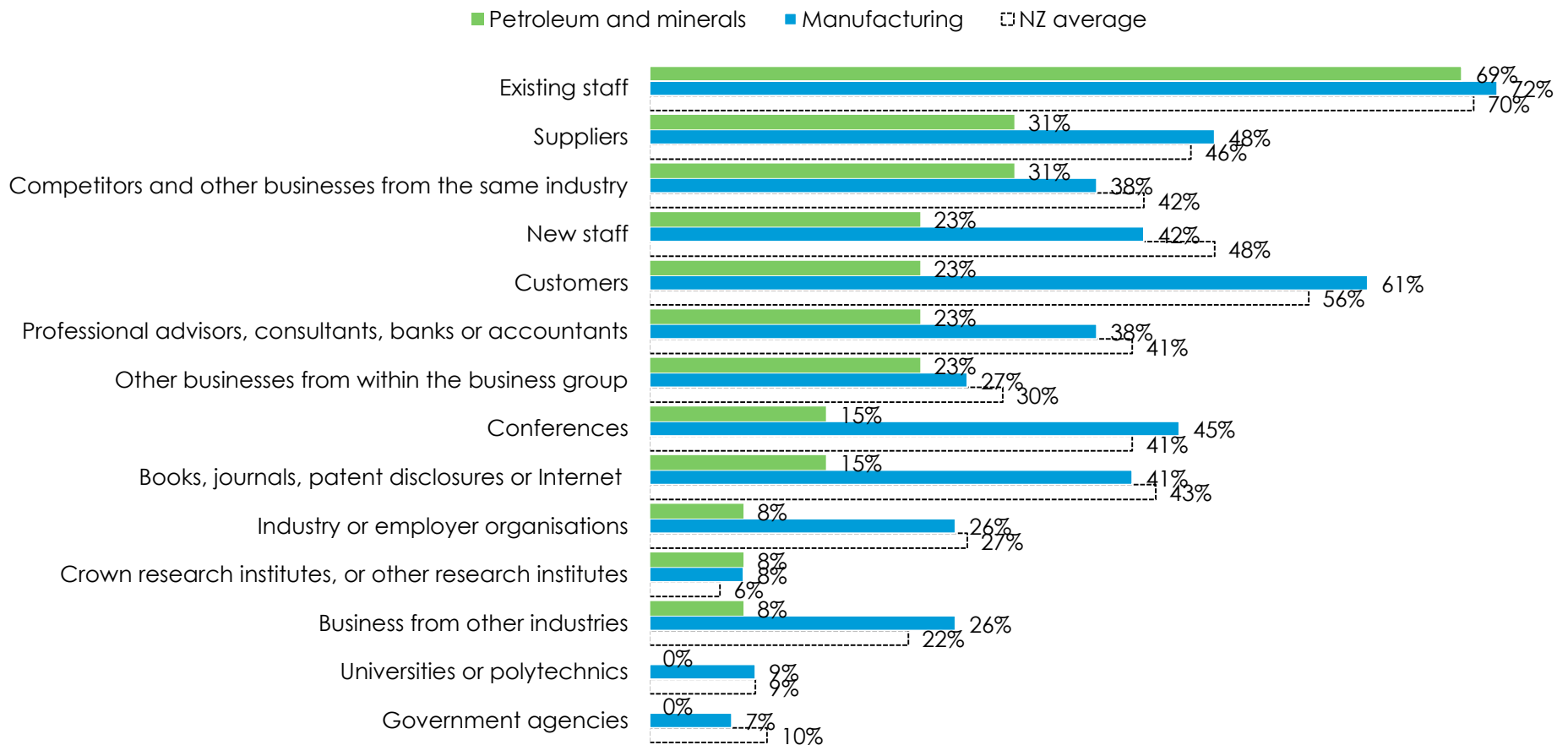


# Sources of ideas for innovation

Staff, suppliers and competitors are the main sources of ideas for innovation

## Sources of ideas or information for innovation

% of firms reporting each source; 2011



## Public funding landscape

The government has contracted for a range of research related to the petroleum and minerals sector

Organisation	Details	Amount (excluding GST)
<b>Contestable investments<sup>1</sup></b>		
<b>GNS Science</b>	NZ Petroleum Resources	\$531k per annum 1 October 2009 – 30 September 2015
	Gas Hydrates	\$536k per annum 1 October 2012 – 30 September 2018
<b>NIWA</b>	Enabling management of offshore mining	\$395k per annum 1 Oct 2012 – 30 September 2016
<b>University of Auckland</b>	Mineral Wealth of the North Island,	\$400k per annum 1 October 2008 – 30 September 2014
<b>University of Otago</b>	South Island Precious Metals	\$356k per annum 1 October 2008 – 30 September 2014
<b>University of Waikato</b>	Tectono-sedimentary framework	\$400k per annum 1 October 2009 – 30 September 2015
<b>CRL Energy Ltd</b>	Minerals Environmental Framework	\$307k per annum 1 October 2012 – 30 September 2014

1. Energy and Minerals Research Fund (snapshot as of 30 November 2012)

## Public funding landscape

The government provides core funding for Crown Research Institutes to conduct research related to the energy and petroleum and minerals sectors

Organisation	Details	Amount <sup>1</sup>
<b>Core funding in Crown Research Institutes</b>		
<b>NIWA</b>	Minerals (off shore)	\$0.5 m per annum <sup>2</sup>
<b>GNS Science</b>	Minerals (on and off shore); oil and gas	\$5.7m per annum <sup>2</sup>
<b>Other public organisations</b>		
<b>New Zealand Petroleum and Minerals</b>	Seismic Petroleum Data Acquisition (departmental multi-year project due to expire on 30 June 2014)	\$4.4m
	Technical Investigation Programme (minerals, geographical data acquisition and other studies. (Multi-year departmental appropriation which expired on 30 June 2013)	\$1.19m

1. Figures as of 30 November 2012

2. Figures exclude GST

## Industry comment

### Industry commented on the impact of new technologies on the industry

- *The only thing that's changed [with unconventional exploration] is the actual technology involved in extracting it, and this has grown in leaps and bounds in the last 5 to 10 years. I believe that that will continue. And I believe New Zealand does have the unconventional resources available for that technology to be taken advantage of. But it may well take 5 or 10 years before we commercialise and realise that the unconventional potential in this country is probably an order of magnitude larger than the conventional reserve potential ever was.*
  - CEO, petroleum exploration and extraction company
- *What has enabled the mining of the lower grade ore has been the advancement in technologies.*
  - Senior executive, minerals sector



## **FINANCIAL PERFORMANCE**

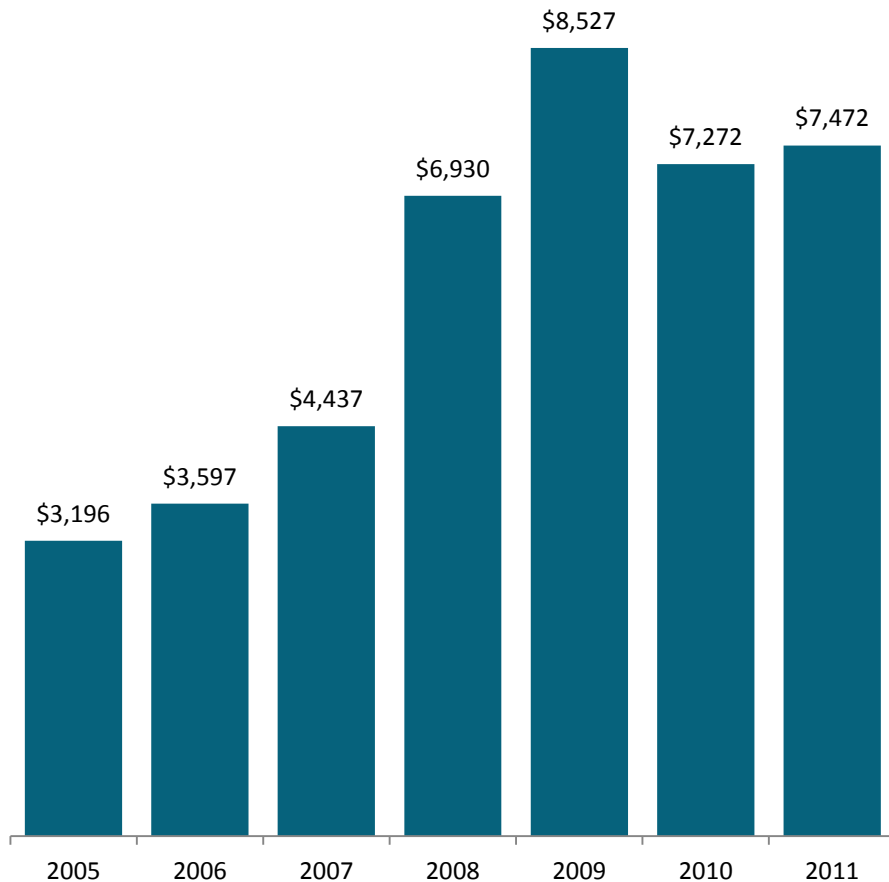


# Revenue

The combined revenue of the petroleum and minerals sector has more than doubled since 2005

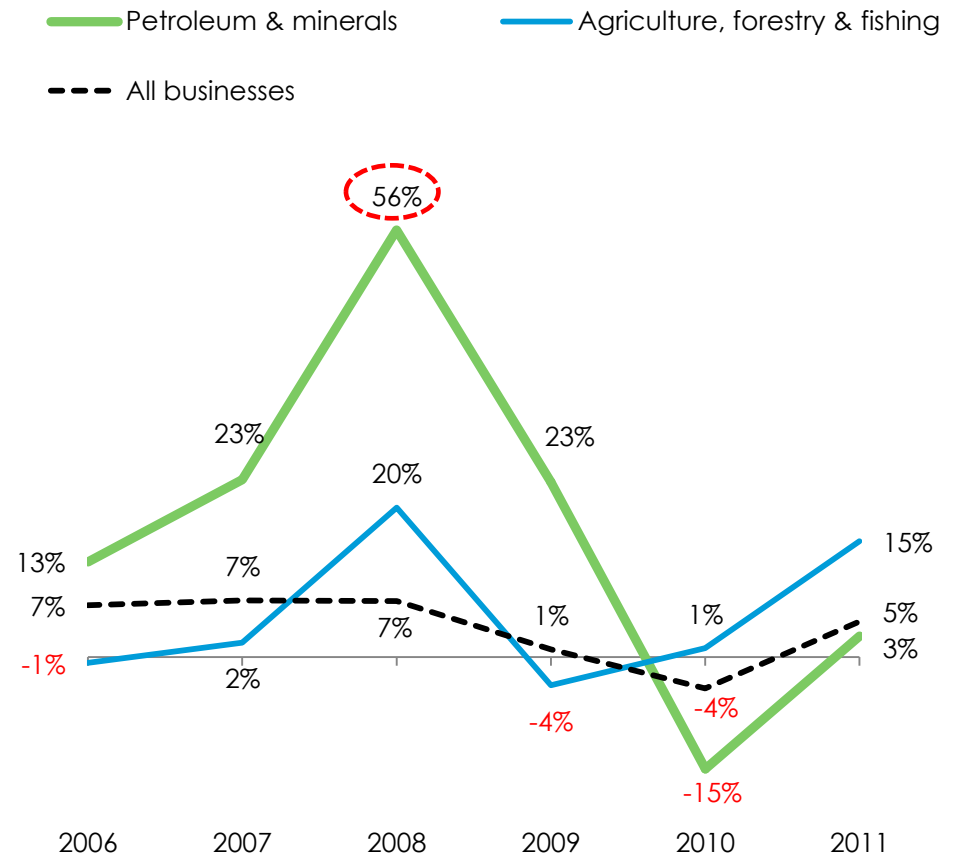
## Total revenues

NZ\$m; nominal; 2005–2011



## Annual growth in sector revenues

%; nominal; 2006–2011

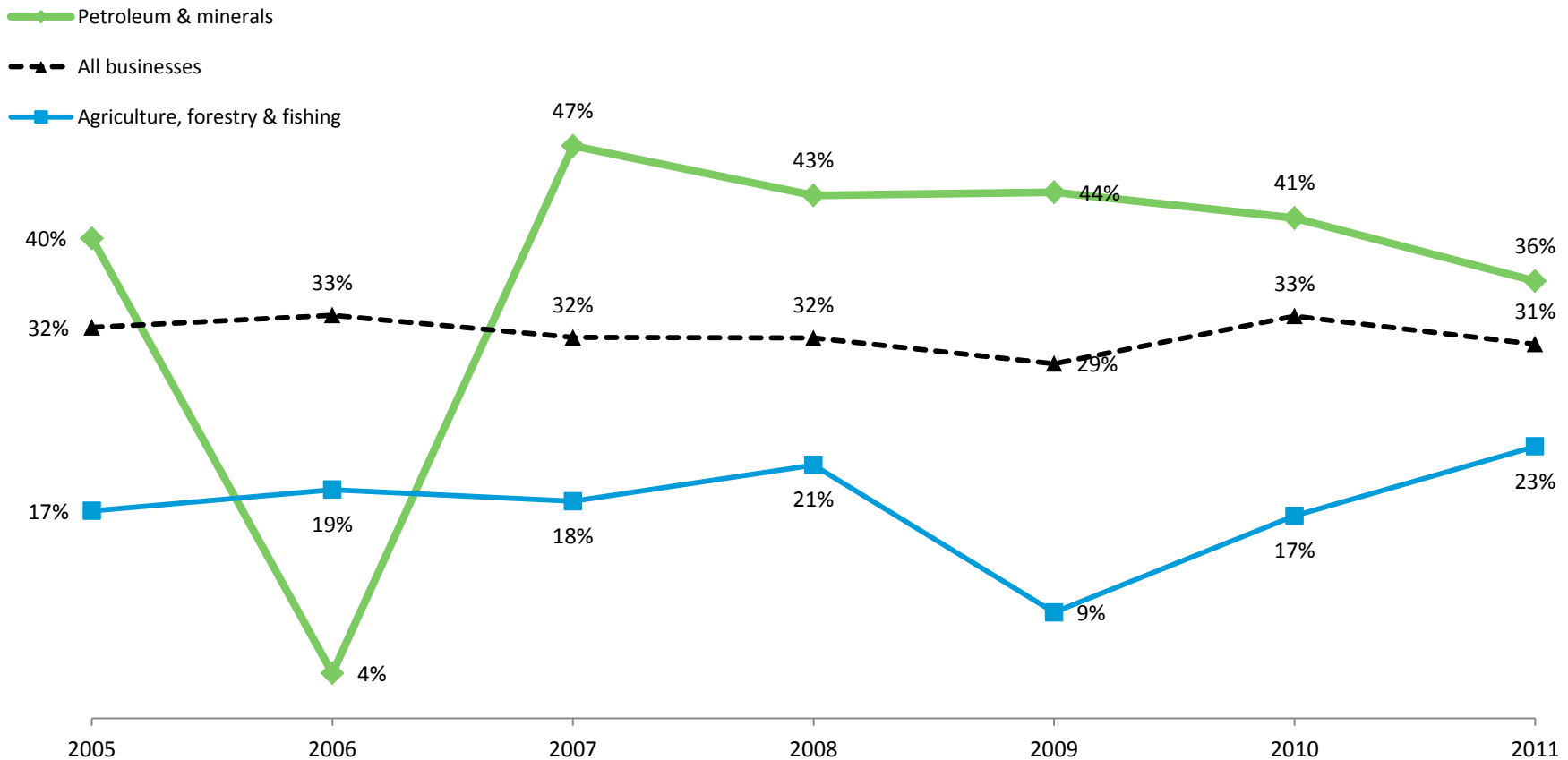


## Value added

Petroleum and minerals firms add greater value than New Zealand firms generally

### Surplus before income tax, plus salaries and wages paid, as a % of total sales; 2005-2011

% of total sales income; 2005-2011





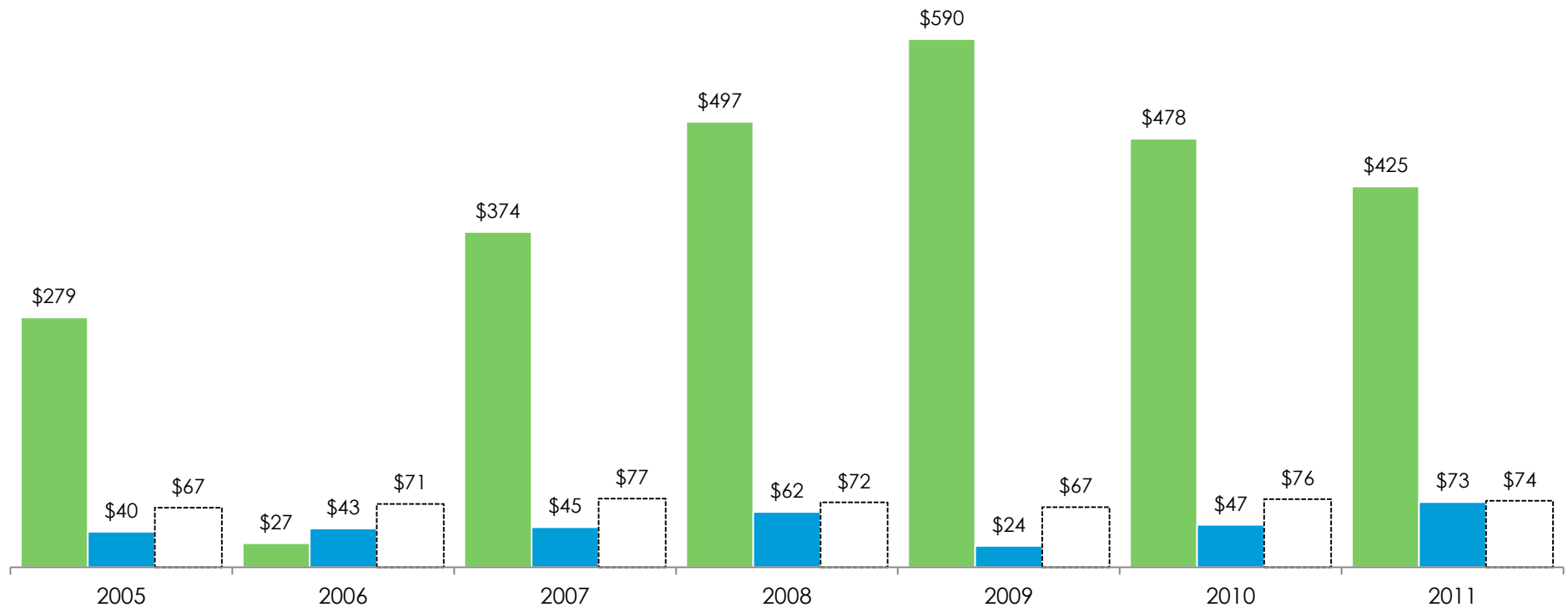
# Productivity

Firms in petroleum and minerals are the most productive in New Zealand

## Surplus before income tax, plus salaries and wages paid, per employee

NZ\$000; nominal; 2005–2011

- Petroleum & minerals
- Agriculture, forestry & fishing
- All businesses



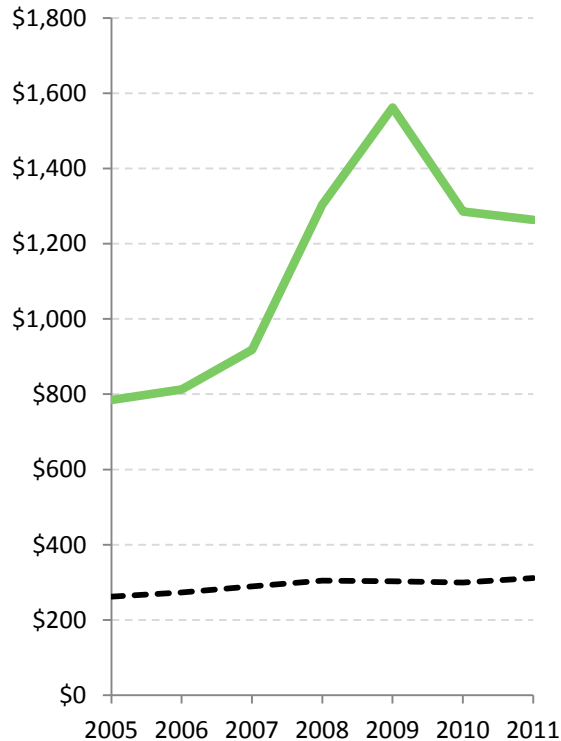
# Financial performance

The strong financial performance of the sector since 2006 reflects significant new production coming on-stream combined with a commodity boom

## Total income per employee

NZ\$000; nominal; 2005–2011

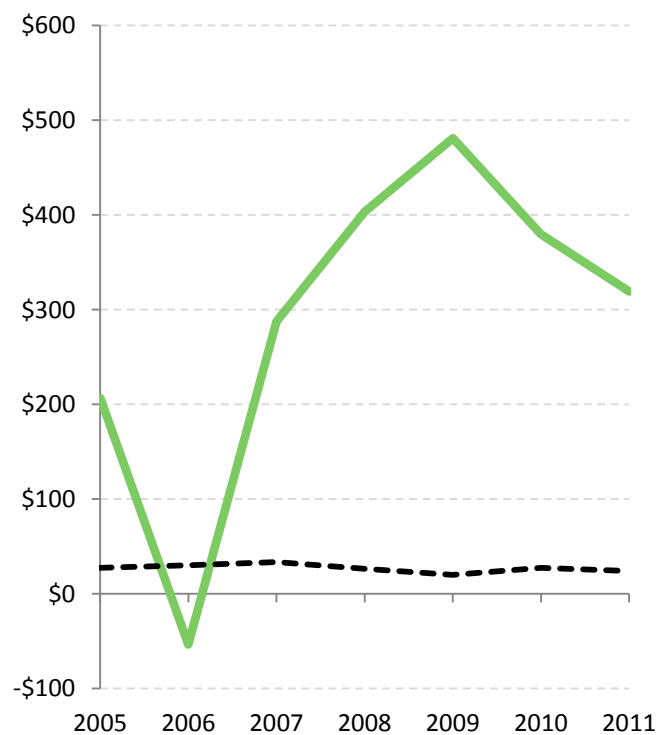
- Petroleum & minerals
- All businesses



## Surplus per employee

NZ\$000; nominal; 2005–2011

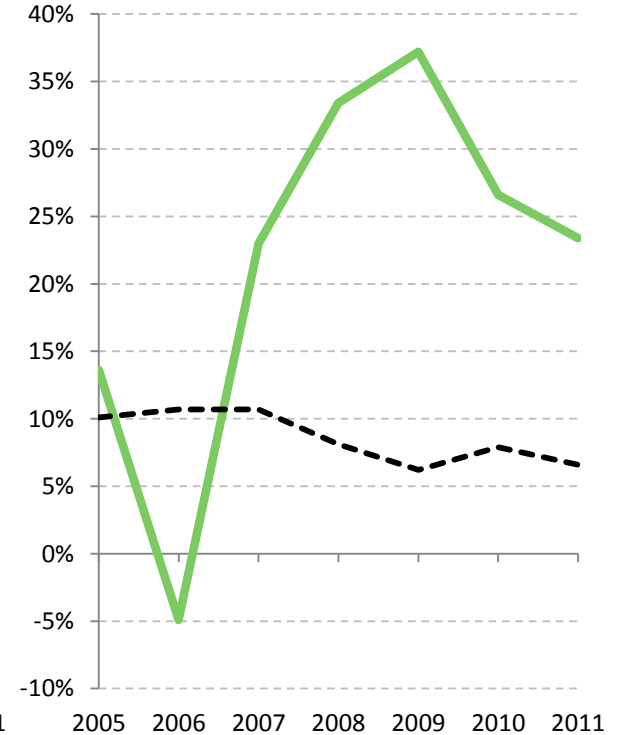
- Petroleum & minerals
- All businesses



## Return on equity

%; 2005–2011

- Petroleum & minerals
- All businesses

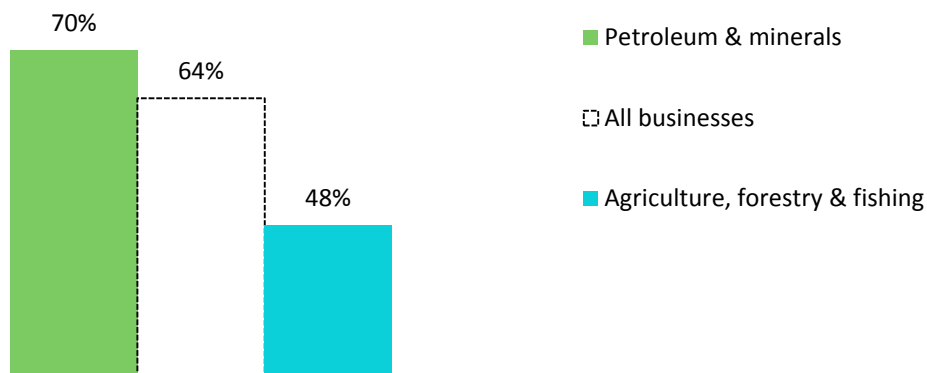


## Balance sheet

Firms in the petroleum & minerals sector took on substantial debt in 2011, up \$5.8b from the year before

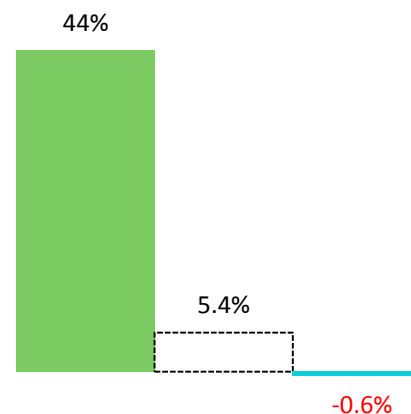
### Debt ratio

% of total assets; 2011



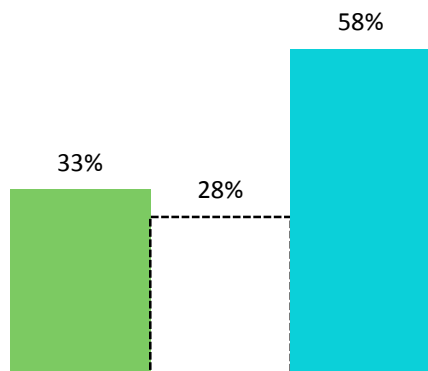
### Change in total liabilities

%; 2011 vs 2010



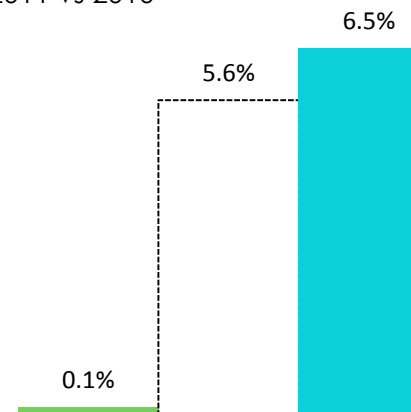
### Tangible assets as a % of total assets

% of total assets; 2011



### Change in equity

%; 2011 vs 2010







**Oil**



## Overview: Oil

New Zealand has significant oil resources, with most owned by the Crown

### Production

Total oil production in 2012 was down 13% from 2011, the lowest in the last five years.

New Zealand's mean production rate was 40,300 barrels per day in 2012, down from the peak production of 58,600 barrels per day in 2008. New Zealand's oil is extracted from 19 fields in the Taranaki region.

- The Maari and Pohokura oil fields dominate oil production; these fields produced 53% of New Zealand's oil in 2012.
- The Tui and Kupe fields were other significant contributors.
- Production at Tui oil field was down by 26% in 2012.
- Two new oil fields started producing in 2011, Sidewinder (TAG Oil Limited) and Copper Moki (New Zealand Energy Corp).

Almost all oil production is exported to Australia for refining. This is because New Zealand crude oil is very high quality and fetches a premium price on the international market. Cheaper foreign oil is imported to refine at the Marsden Point refinery.

### Ownership

The Crown owns all petroleum resources in New Zealand to the 12 nautical mile limit of the territorial sea, and has sovereign rights (but not full sovereignty) over these resources in the Exclusive Economic Zone (12-200 nautical miles off the coast of New Zealand).

Most of the mining permits for the large fields are jointly owned, with the bulk of investment coming from foreign companies. Several of these, such as Kea Petroleum and Tag Oil have been established specifically with the objective of investing in New Zealand.

### Oil exploration & development

From 2007 New Zealand has experienced historically high rates of expenditure on exploration and development totalling \$8.3 billion for the period, of which \$1.5 billion was spent in 2012.

Exploration and development activity was the highest it has been in the past 10 years, with 52 wells drilled in 2011, an increase from the 45 wells drilled in 2010 and the 37 wells drilled in 2009.

Offshore well drilling decreased from 10 wells in 2010 to two in 2011, and onshore drilling increased from 35 wells to 50 in the same period. Off-shore drilling has picked up in 2013.

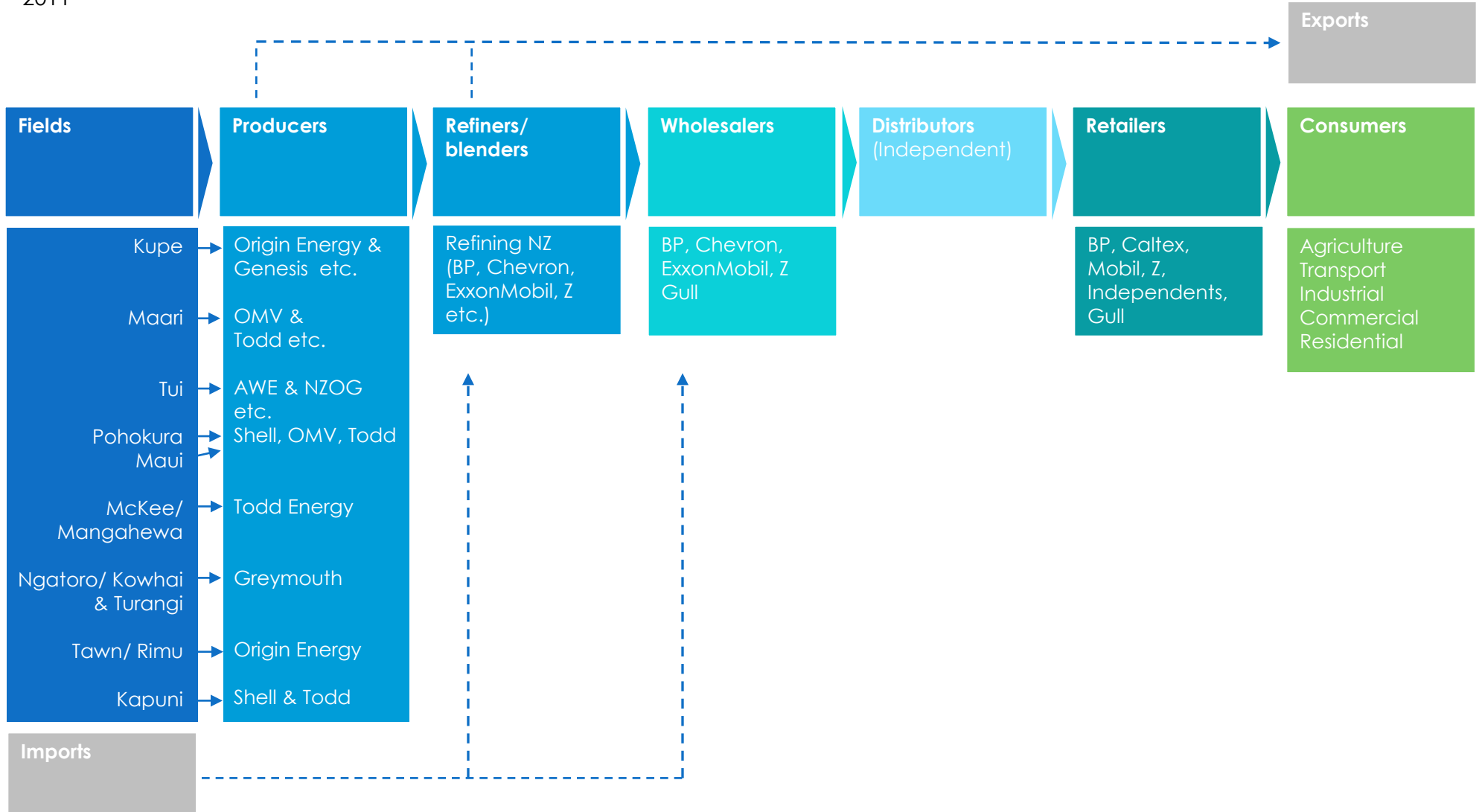
In 2011, a total of 8,353 km of new 2D seismic surveys were acquired, as well as 6,864 km<sup>2</sup> of new 3D seismic surveys. A significant quantity of 2D and 3D seismic data were also reprocessed in 2011.

# Simplified value chain

The New Zealand oil sector has a relatively straight forward value chain

## Oil sector value chain

2011

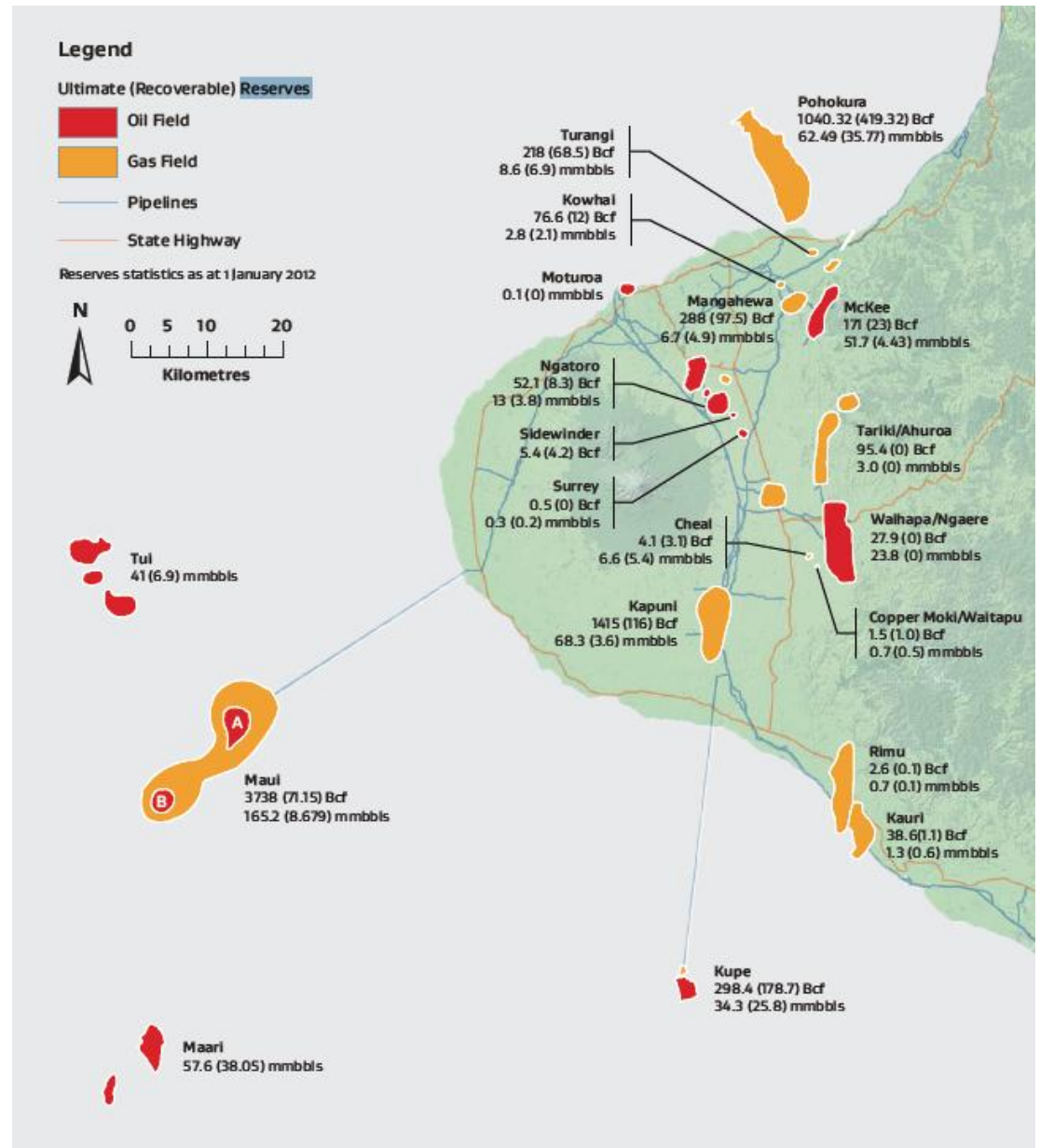


Source: Ministry of Business, Innovation and Employment: New Zealand Energy Data File (2012)



## Location of producing petroleum (oil and gas) fields

All of the producing oil and gas fields are located in and around the Taranaki region

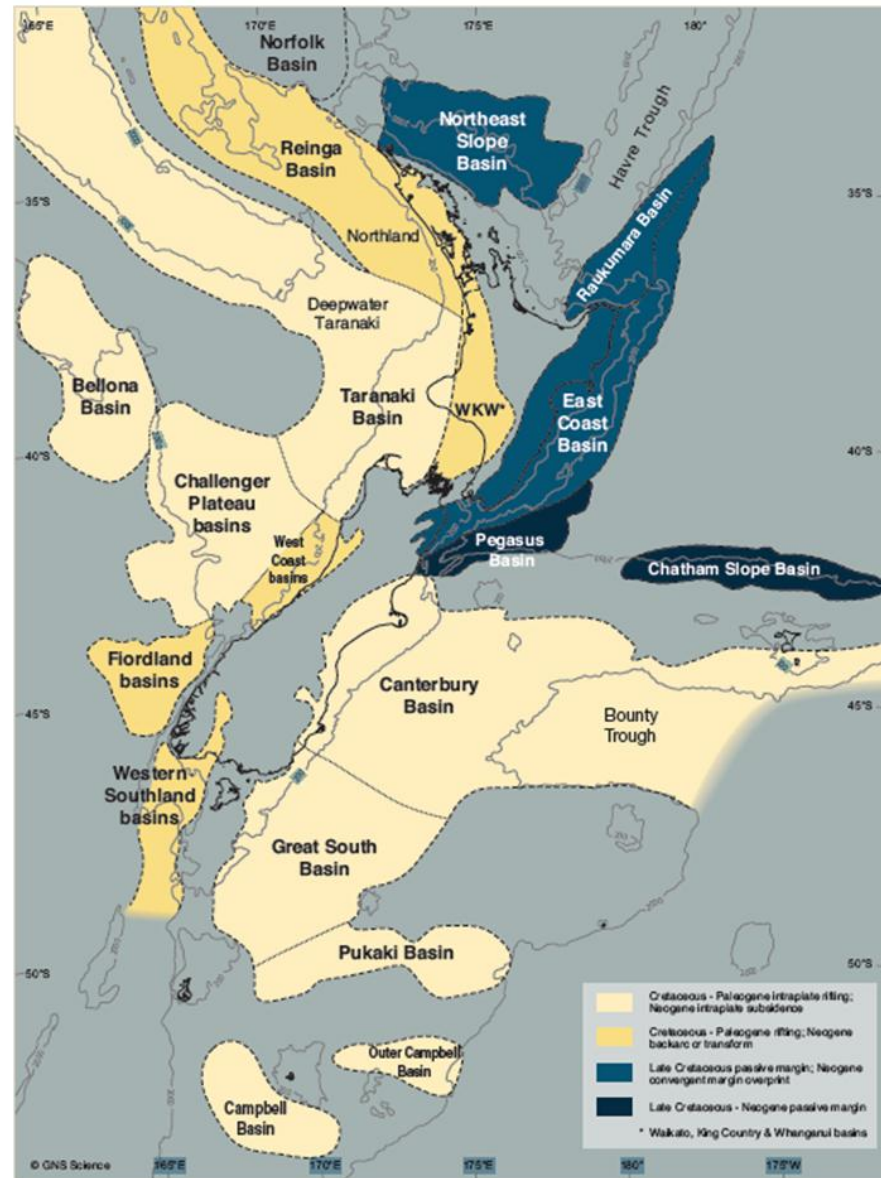


Location of oil and gas fields in the Taranaki Region, 2012

Source: Ministry of Business, Innovation and Employment: Energy in New Zealand, 2013

## New Zealand petroleum basins

Outside of Taranaki, New Zealand has seventeen other petroleum basins which are under-explored.



Location of New Zealand's petroleum basins, 2012

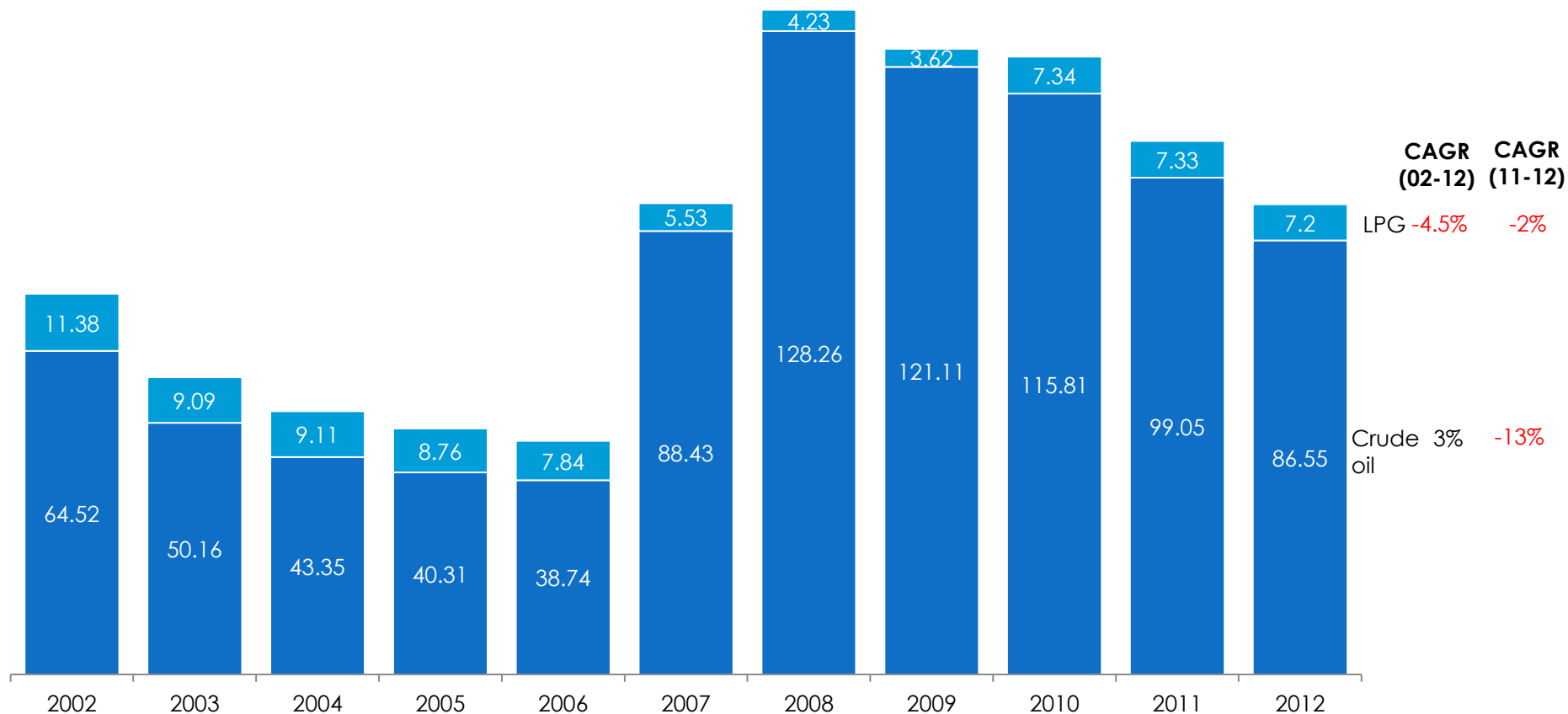
Source: New Zealand Petroleum and Minerals,  
<http://www.nzpam.govt.nz>

## Total production

Crude oil production grew strongly in 2007/2008 as the Tui & Pohukura fields came on stream

### Crude oil & LPG production

Petajoules; 2002–2012

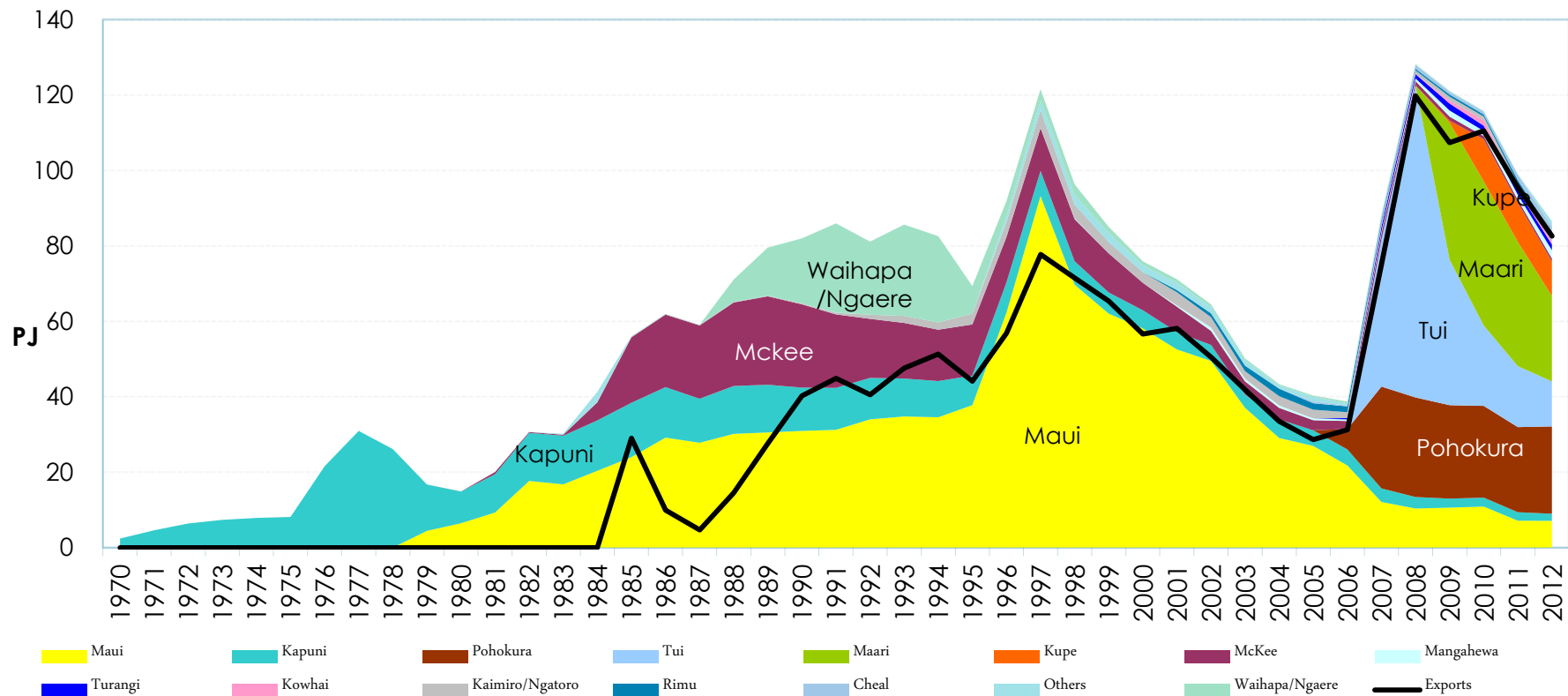


## Production by field

Oil production grew strongly from 2007 driven by the Tui, Pohokura and Maari fields, replacing fall-off in production from the Maui, McKee and Waihapa/Ngaere fields

### Annual crude, condensate, naphtha\* and natural gas liquids by field

Petajoules



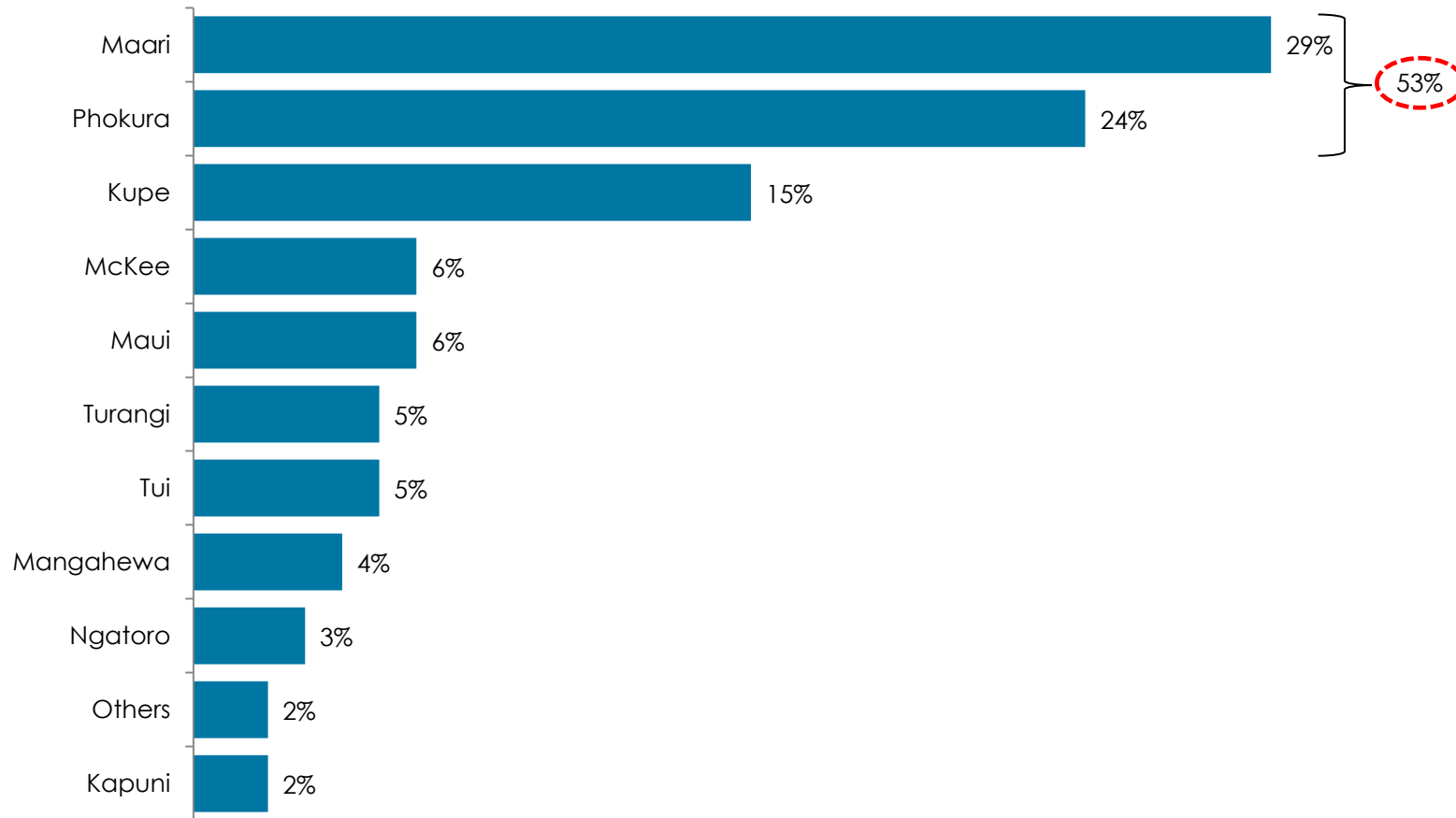
\*Naphtha is a form of liquid hydrocarbon. Source: Ministry of Business, Innovation and Employment: Energy in New Zealand, 2013

## Reserves in producing wells

The Maari and Pohokura fields account for half of the estimated recoverable oil reserves in producing wells

### Remaining P50 oil reserves at 1 January, 2012

Oil reserves, 2012



Other includes: Rimu, Waihapa/Ngaere, Tariki/Ahuroa, Kauri, Moturoa, Surrey, Kapuni, Cheal and McKee fields;

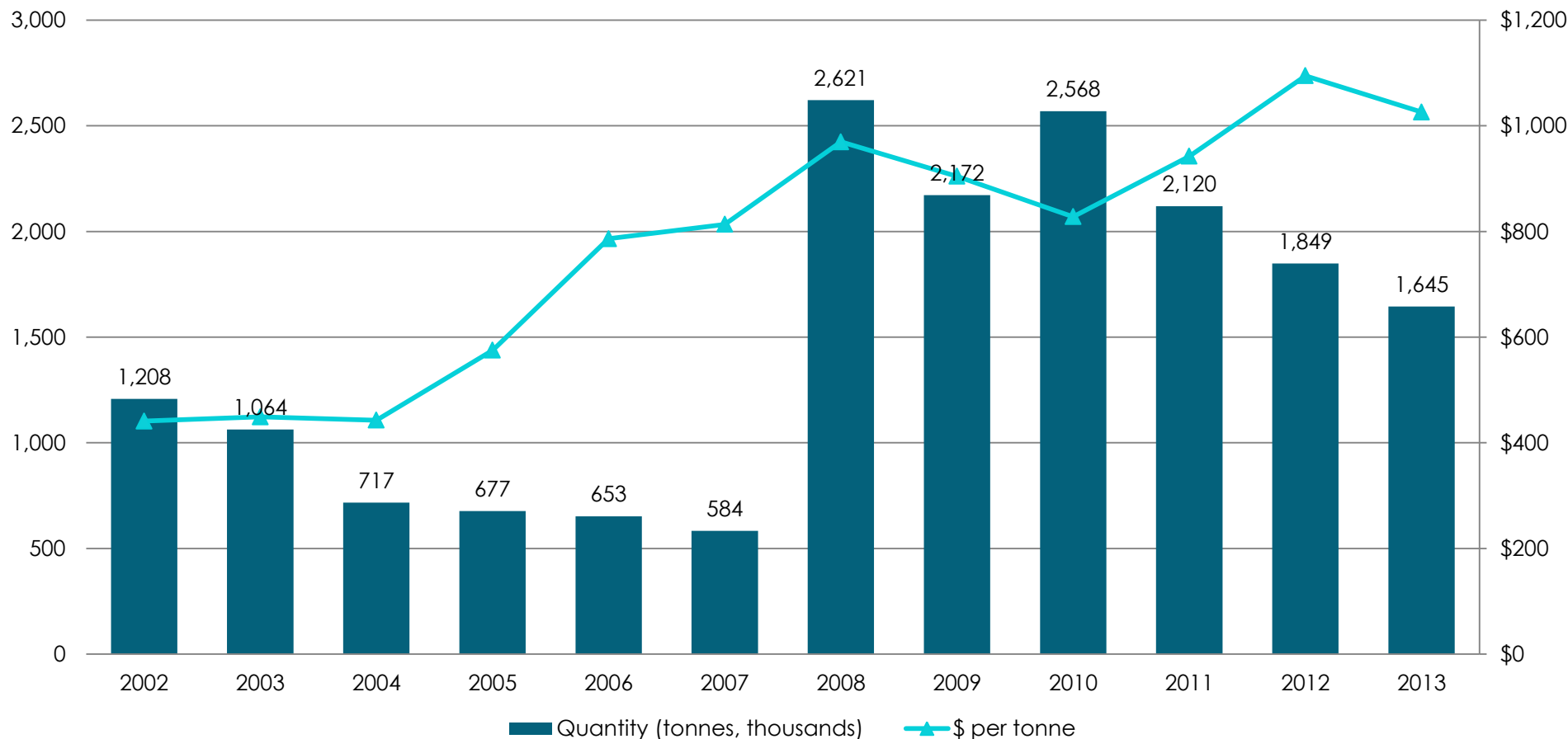
Source: Ministry of Business, Innovation and Employment: Energy in New Zealand, 2013

## Crude oil exports; quantity and unit price

Crude oil has made a strong contribution to export performance from 2008, driven by both increased production and rising prices

### New Zealand crude oil export value and volume

Tonnes; NZ\$ per tonne; 2002-2013 (June years)

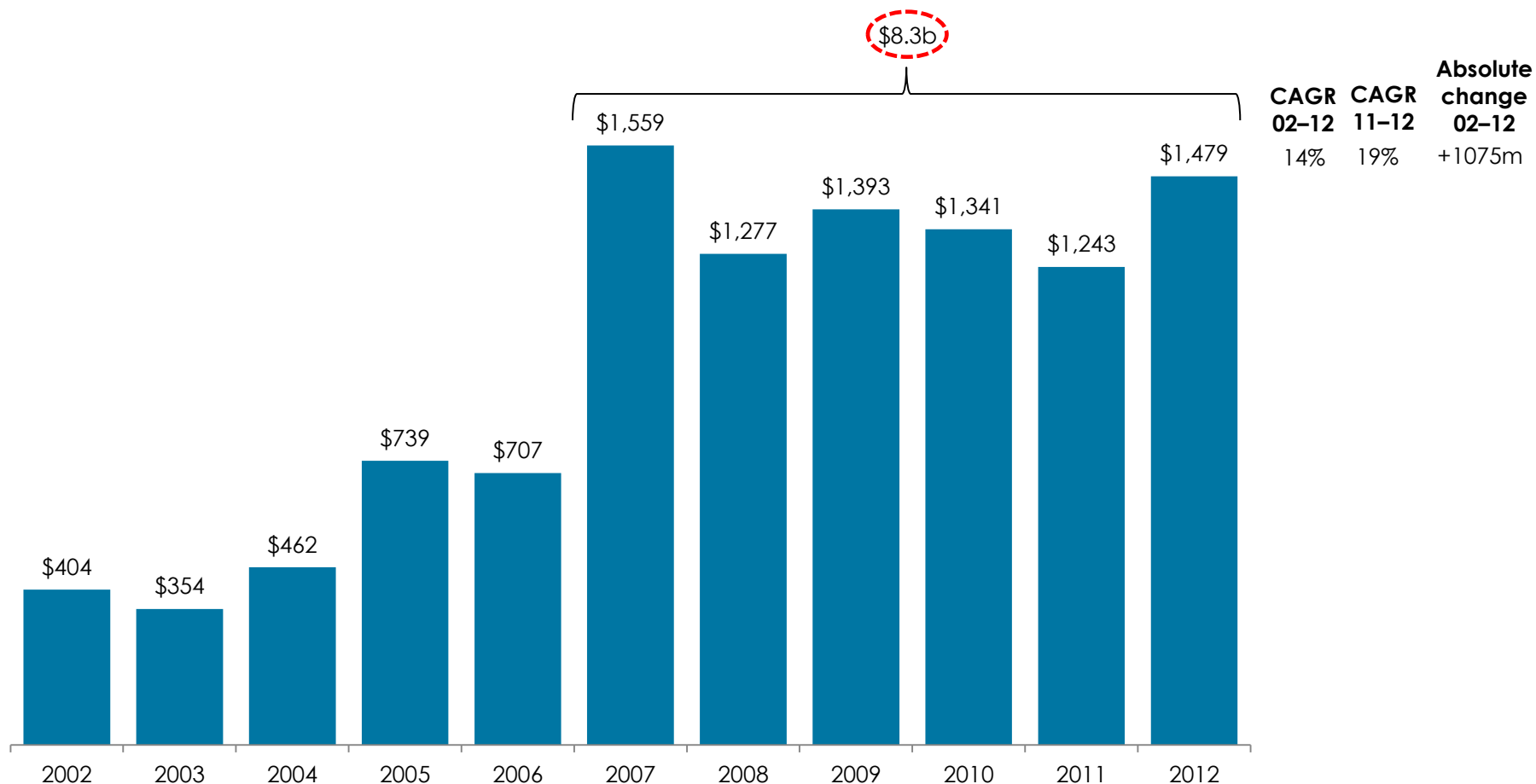


## Exploration

Expenditure on oil (and gas) exploration and development jumped in 2007, with a total of \$8.3 billion spent in the last six years

### Expenditure on oil and gas exploration & development

NZ\$m; 2002-2012



## Wells drilled

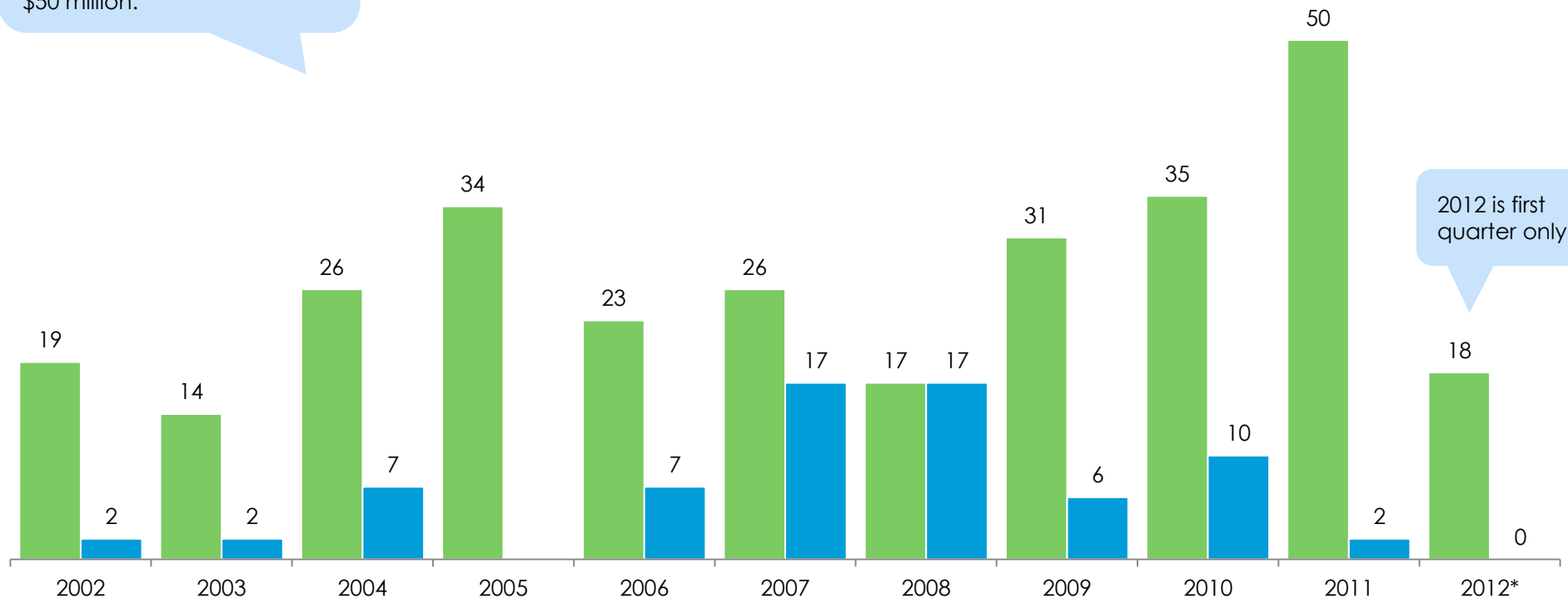
The number of wells drilled in new Zealand has increased recently, with 2011 a standout year

### Onshore and offshore well drilled

Number of wells, 2002–2012\* (1<sup>st</sup> quarter only)

An onshore well is likely to cost around \$2 million, whereas an offshore well is likely to cost in the order of \$50 million.

■ Onshore ■ Offshore



2012 is first quarter only



## Industry comment

### Industry see significant opportunities in New Zealand's petroleum basins

- *A key for the industry and for New Zealand is increased exploration. With the only producing wells in New Zealand in Taranaki, New Zealand is currently a one-trick pony. We are a long way from the rest of the world, with no local market, little infrastructure and high cost... If we could have another commercial discovery outside of Taranaki, that would increase New Zealand's attractiveness as an international investment destination.*
  - Industry leader
- *I think it is an absolute surety [the probability of a new major find]. I think that the only thing that needs to be done is to attract the investment money to go out there and look for it. There's 17 or 18 different sedimentary basins here. ...only one has been commercialised to date, the Taranaki Basin. We know that many of those other basins have working hydrocarbon systems. In other words the kitchen is working. They are creating oil and gas down there. We know that because it's seeping out of the surface in places where there has been one or two wells drilled. In the case of the Canterbury Basin, they have found oil and gas already, so that's the biggest risk mitigated right off the bat... I believe that there will be many more large discoveries made in this country. But it's going to be some time to get the international community to recognise that potential and to get the kind of money that you need.*
  - CEO, petroleum exploration and extraction company





## NATURAL GAS



## Overview: natural gas

Natural gas is a major source of energy for New Zealand and a feedstock for manufacture of methanol and fertiliser

### Production

Gas is produced entirely in the Taranaki Region from 17 fields. In 2012 production is dominated by the Pohokura field (38%) and the Maui field (19%).

Production increased by 7% in 2012, driven by a 6% increase in output from the Maui field over 2011.

### Contribution to economy

Natural gas provides 21% of the total energy used in the New Zealand economy – 179 out of 845 petajoules of the Total Primary Energy Supply.

Gas is used directly by around 1,500 industrial users, (e.g. Fonterra, New Zealand Steel) 14,000 commercial users and reticulated to around 246,000 residential consumers. These users are almost entirely in the North Island, due to the difficulties of reticulating gas to the South Island.

Around 20% of gas consumption in 2012 was as a feedstock in the petrochemicals sector, including the Methanex methanol plant, the Ballance Agri-Nutrients ammonia/urea plant at Kapuni, and the Degussa peroxide plant near Morrinsville. Much of this production is exported.

These industries provide a ready local market for gas in New Zealand, which decreases significantly the commercial risk for petroleum exploration and extraction companies.

### Ownership

The industry in New Zealand has seen considerable merger and acquisition activity since the privatisation of state owned Petrocorp in the late 1980s and the energy reforms of the late 1990s.

Activity has been directed at:

- building scale and vertical integration (e.g. Vector, Powerco); and/or
- building integrated (electricity and gas) energy firms (Genesis).

Shell and Todd Energy-owned subsidiaries control a large portion of the production end of the market.

### Infrastructure

There are more than 3,500 km of high pressure gas transmission pipelines in New Zealand. New Zealand has two main transmission entities: Vector's transmission network and the Maui pipeline (owned by Maui Development Limited). All gas from Maui, Pohokura, McKee, Mangahewa and Kowhai is delivered into the Maui pipeline.

More than 2,800 km of intermediate, medium and low-pressure gas distribution pipeline networks in the North Island are connected to the high-pressure transmission system.

Vector operates extensive gas distribution and retail operations in the North Island.

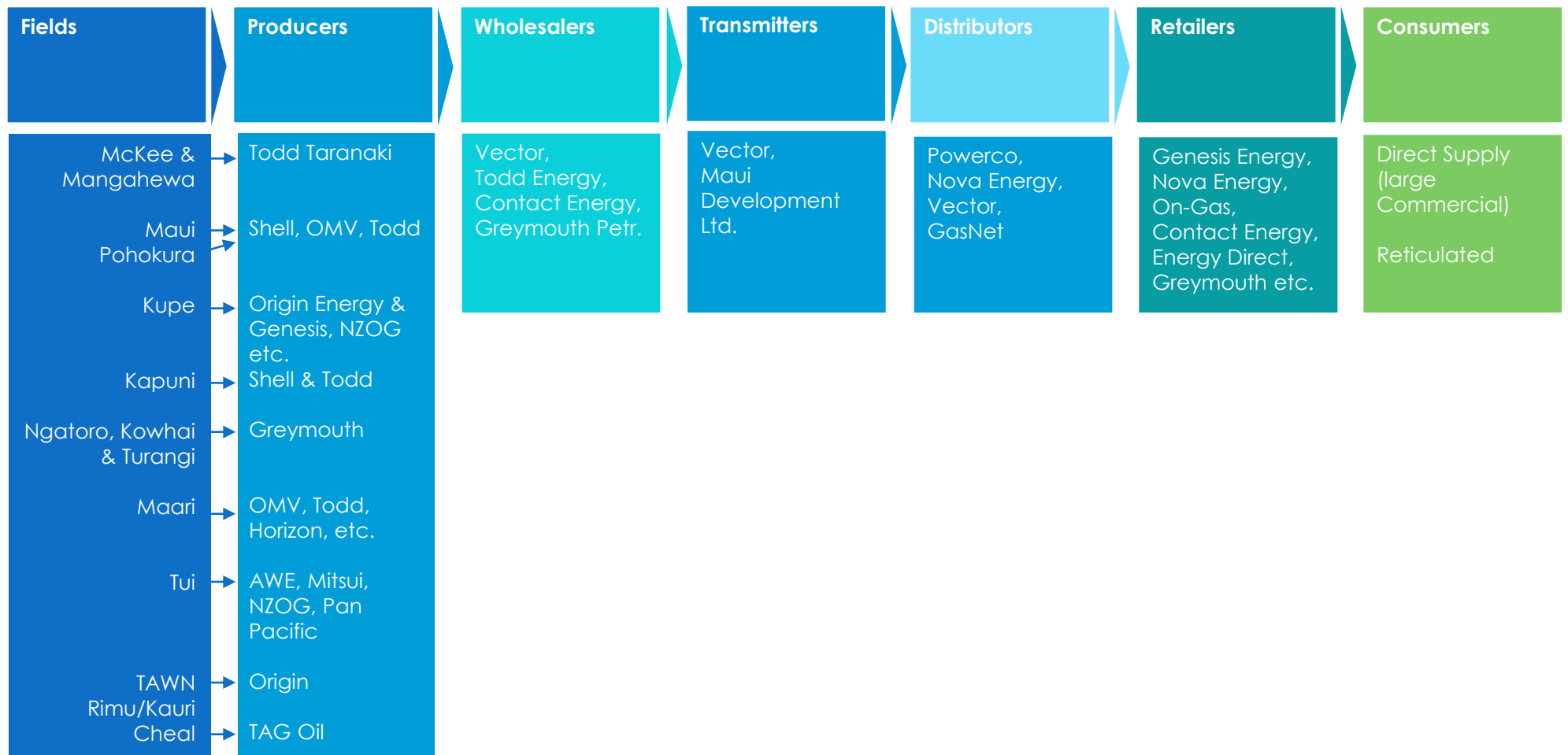
There are four gas distributors: Vector, Powerco, Nova Gas and GasNet (network operator, owned by Wanganui Gas).

# Simplified value chain

The New Zealand natural gas sector has a relatively straight forward value chain

## Natural gas sector value chain

2011

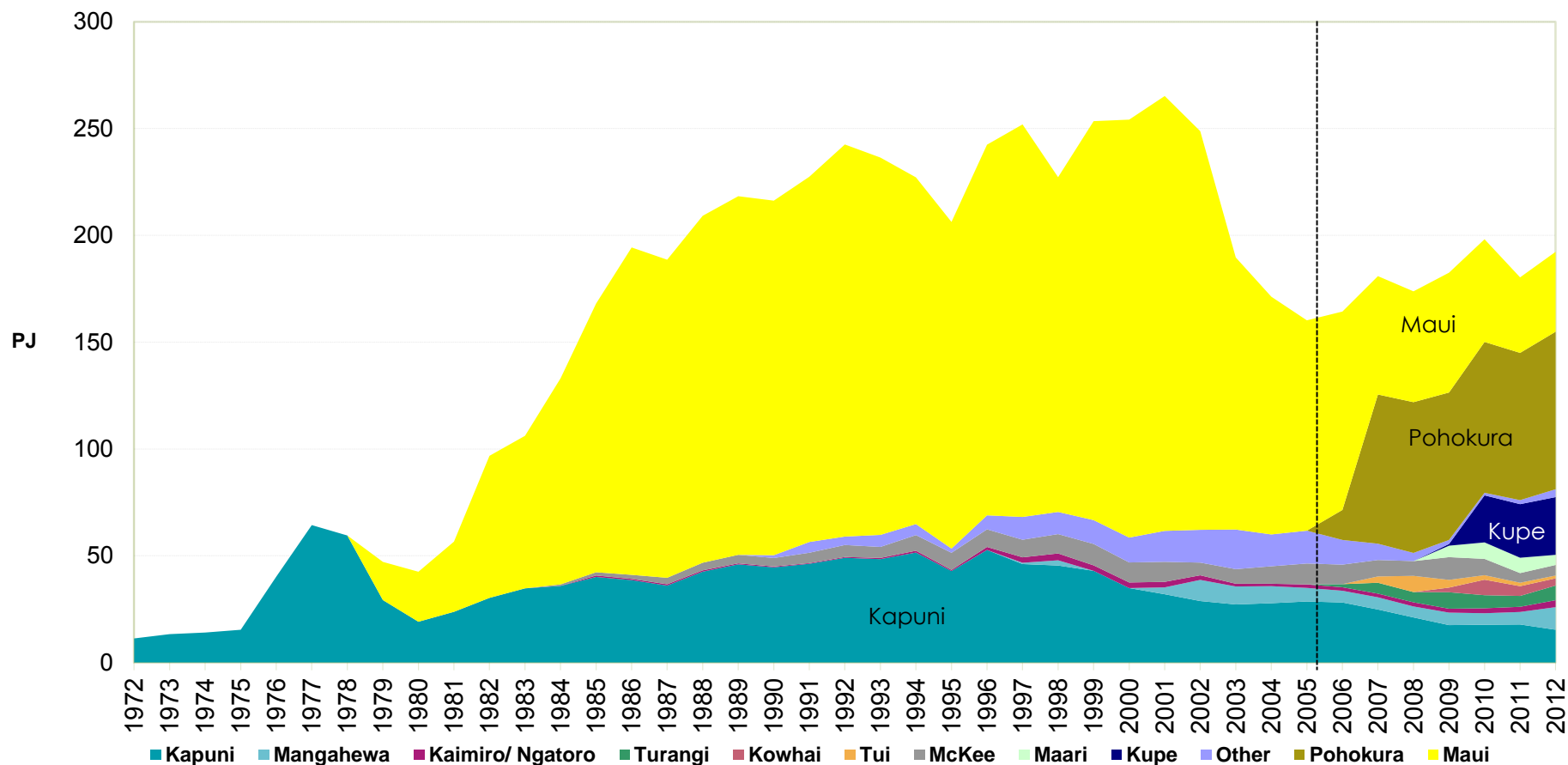


## Production

Gas production has increased marginally since 2005, with the decline of the Maui field being replaced by the growth of the Pohokura field and a number of smaller fields

### Natural gas production by field, 1972–2012

Petajoules

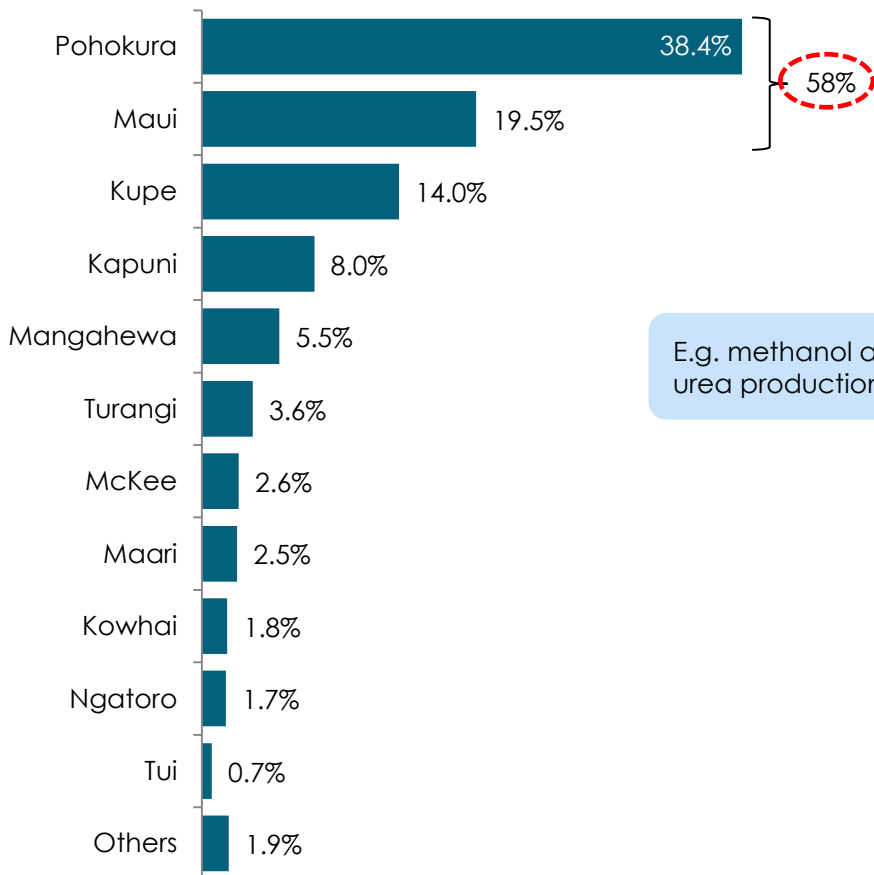


## Natural gas production and consumption

The Pohokura and Maui fields account for 58% of production; electricity and industrial uses comprise 71% of consumption

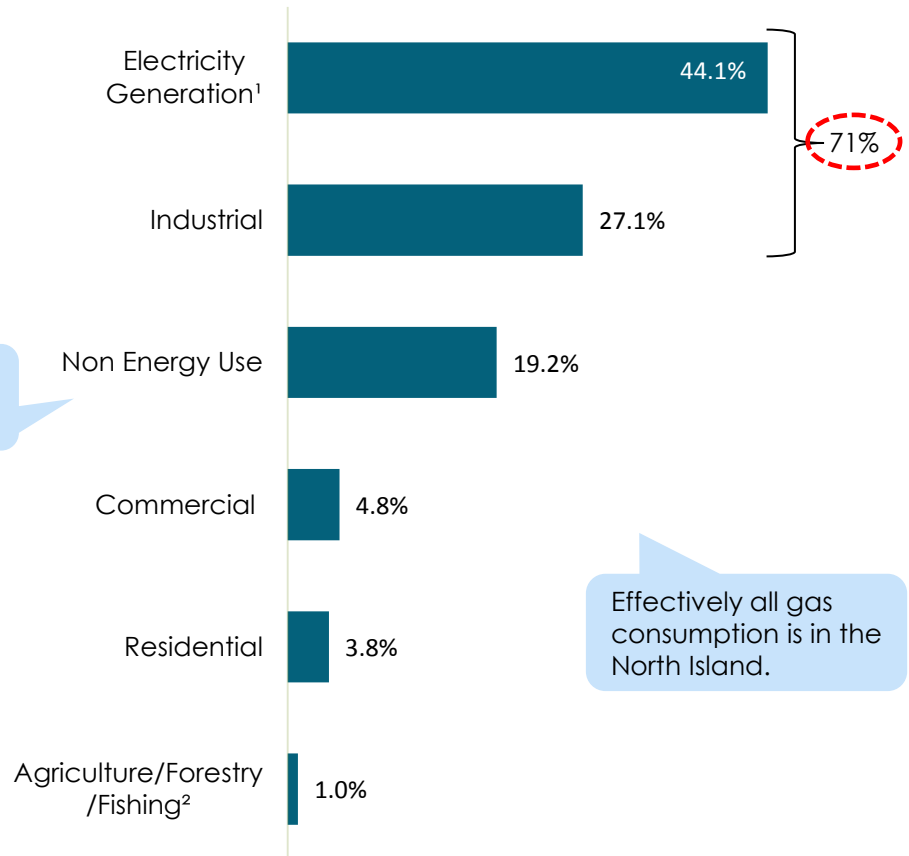
### Natural gas production by field, 2012

% petajoules (PJ), 2012



### Natural gas consumption by sector

% petajoules (PJ); 2012



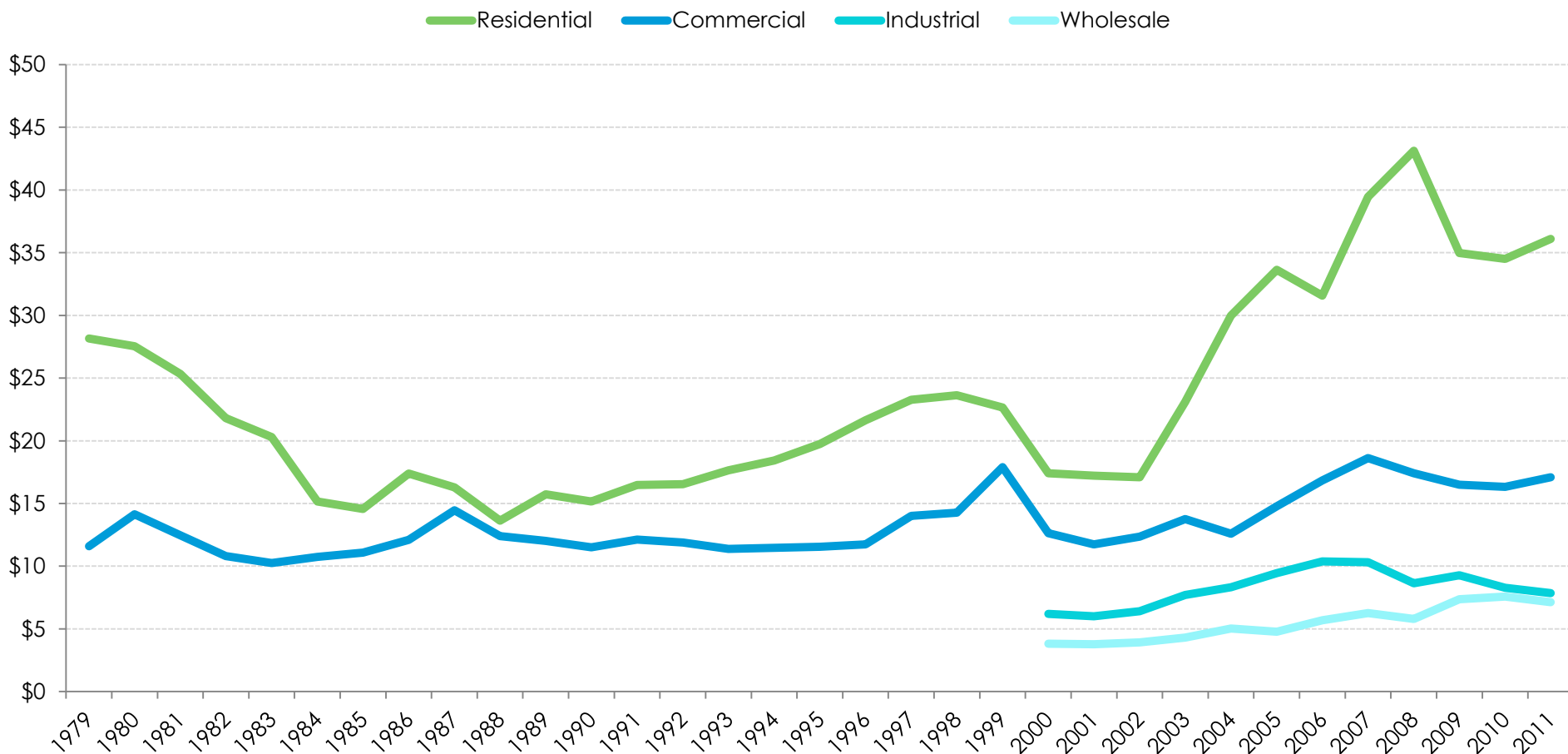


## Domestic prices

Natural gas prices have been relatively stable for all customers except residential (4% of total gas use)

### Inflation-adjusted average annual natural gas prices in New Zealand by sector

NZ\$ per gigajoule; 1979–2011







## COAL

# Overview: New Zealand

## The coal industry supplies both domestic and export markets

### Production

In 2012, New Zealand produced 4.9 million tonnes of coal, of which over 2.2 million tonnes were exported.

The total amount of coal used locally in 2012 was 2.8 million tonnes, of which 1000 tonnes were imported, a significant drop from the 0.2 million tonnes imported in 2011.

Over 93% of all production is bituminous and sub-bituminous coals. Lignite makes up 80% of national coal resources, but lignite production in 2012 represented only 7% of total production, mostly as a consequence of its low energy content and distance from the main centres of energy demand.

Production is centred in the Waikato (1.8 million tonnes, mainly for several major industrial users and the Huntly power station) and on the West Coast (2.4 million tonnes, mainly for export). The remaining production is from Southland, Otago and Canterbury.

Four underground and 18 opencast mines were operating in 2012. Over 60% of national production was from two large opencast operations, at Rotowaro and Stockton.

### Markets

Coal plays an important part in the New Zealand economy, accounting for around 5% of New Zealand's total consumer energy supply. New Zealand used 3.2 million tonnes (69.9 PJ) of coal in 2012, 16% more than the previous year.

The biggest domestic users are the Huntly power station and the Glenbrook steel mill. In 2012 Huntly power station consumed around 1.3 million tonnes, almost double what it consumed in 2011. The Glenbrook steel mill consumed around 0.8 million tonnes. Coal also provides process heat for the dairy, meat and timber industries, and underpins cement making. It is the only fuel available for industrial use at scale in the South Island where it is also used extensively for heating schools and hospitals.

Exports of bituminous coal, produced entirely from the West Coast, were 2.2 million tonnes or 69.4 PJ for 2012, up 2% from 2011 levels. New Zealand coal is exported mainly to India, China and Japan, with smaller quantities going to Chile, South Africa, Brazil, China, USA and Australia. Most exports are of semi-soft and hard coking coal, with smaller amounts of thermal and specialist coals.

The value of coal exports is confidential. However, other countries reported importing a total of US\$394 million of New Zealand coal in 2012.

### Ownership

State-owned Solid Energy is responsible for over 80% of national production. A number of smaller private coal-mining companies produced the remainder.

There are 44 current coal mining permits and 21 coal mining licences issued by New Zealand Petroleum & Minerals, many of which cover small mines that are not producing. There are 50 coal exploration permits.

The Crown owns only about half of New Zealand's coal resources, and mining of privately owned coal is not subject to the Crown Minerals Act 1991, although earlier legislation covers mining of some privately-owned coal.

# Overview: global

## Current global situation

Softening global demand for steel has seen coking coal retreat to US\$120 a tonne from over US\$290 a tonne in 2011. Thermal coal prices have dropped from US\$120 a tonne to less than US\$80 a tonne, partly because of a significant increase in production of cheap shale gas in the US. This has seen US electricity generators switching to gas away from coal, with US thermal coal producers switching to export markets.

## Impact on New Zealand

Low global coal prices and a high New Zealand dollar saw Solid Energy review its operations and cut production and jobs. The Spring Creek underground mine was closed and other Solid Energy projects, such as the Maitua lignite briquette plant, are in doubt. Solid Energy production was flat for the year with the Stockton and Strongman opencast mines picking up production to offset the closure of Spring Creek.

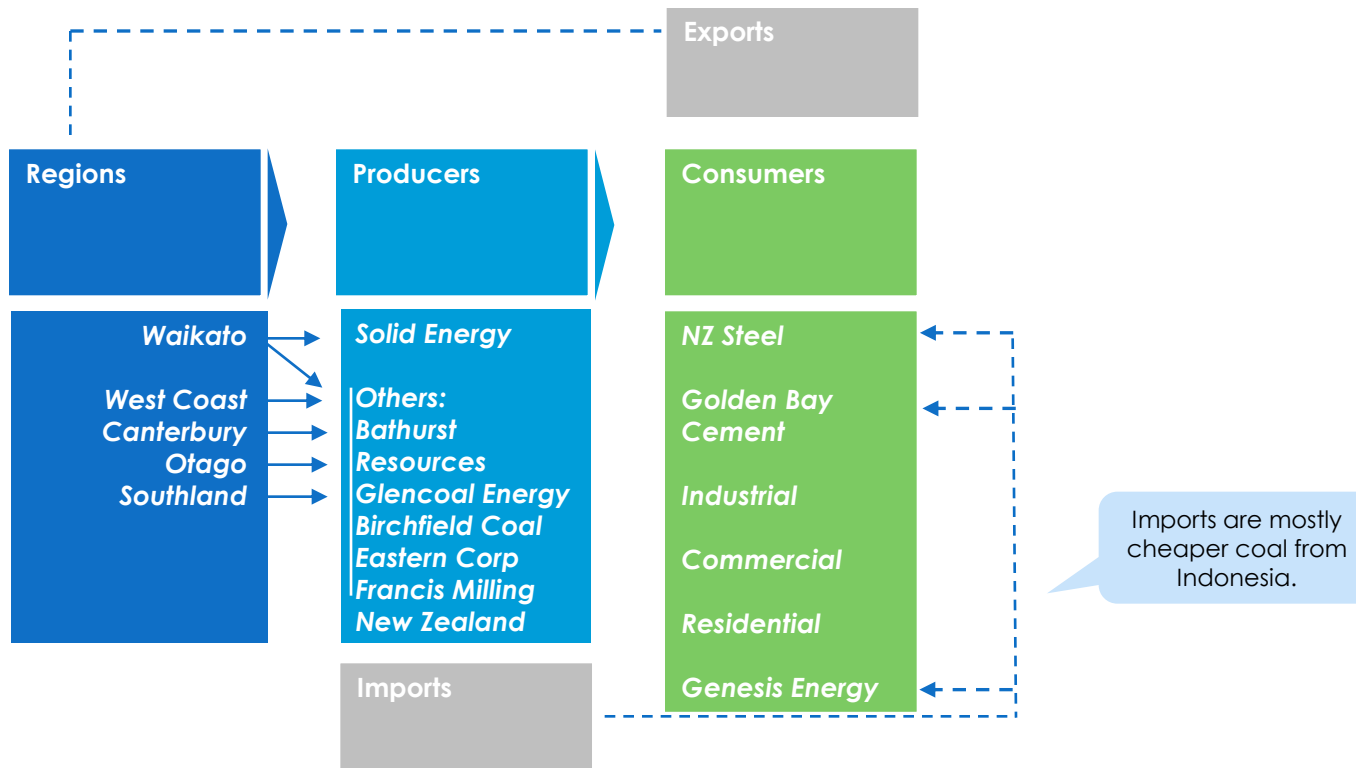
A more subtle but fundamental influence on New Zealand coal production is that the costs of mining are rising as our more accessible coal deposits are worked out. With underground mining, costs are now exceeding market price. Together with the increasing difficulty of obtaining land access and resource consents, this indicates a theme of increasing barriers to mining on cost and access.

# Simplified value chain

The New Zealand coal sector has a simple value chain

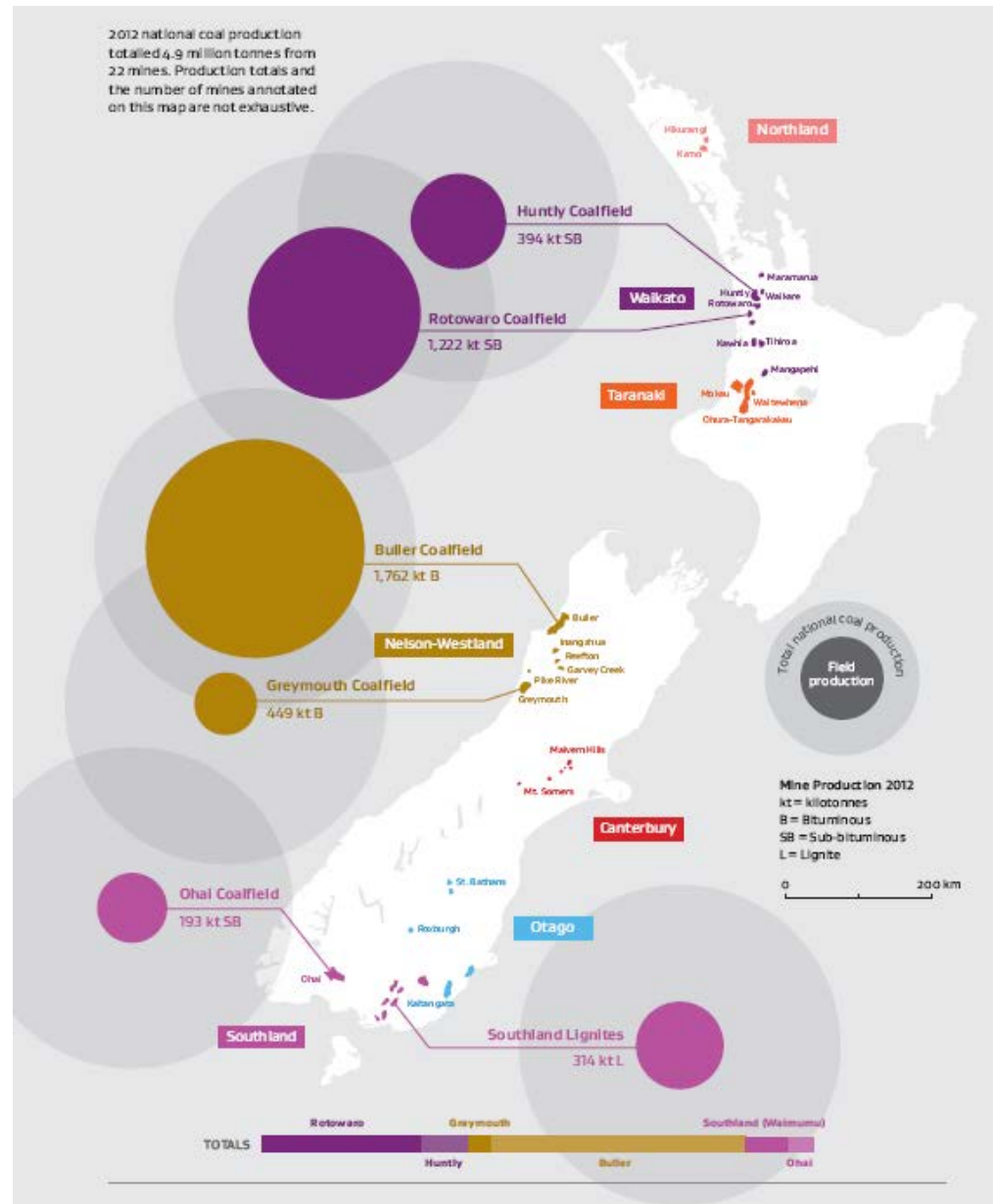
## Coal sector simplified value chain

2011



# Location of coal fields

Coal fields are located across New Zealand, with key fields in the Waikato, West Coast, and Otago/ Southland



**Location of New Zealand Coal Resources and 2012 Coal Production**

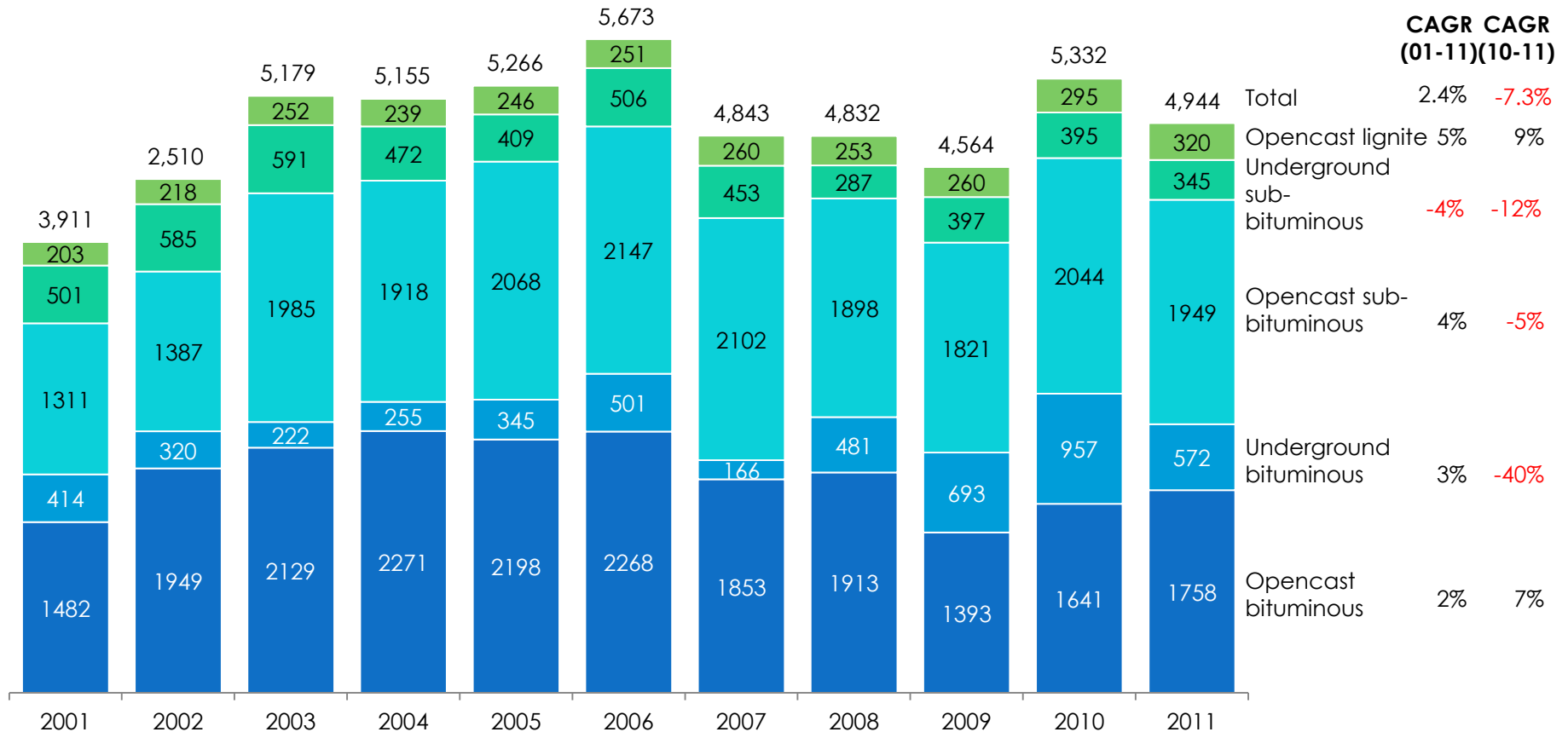
Source: Ministry of Business, Innovation and Employment: Energy in New Zealand, 2013

# Production

New Zealand coal production has been relatively stable over the past decade

## Annual coal production by rank and mining method

Kilotonnes; 2001–2011



Source: Ministry of Business, Innovation and Employment: New Zealand Energy Data File (2011)

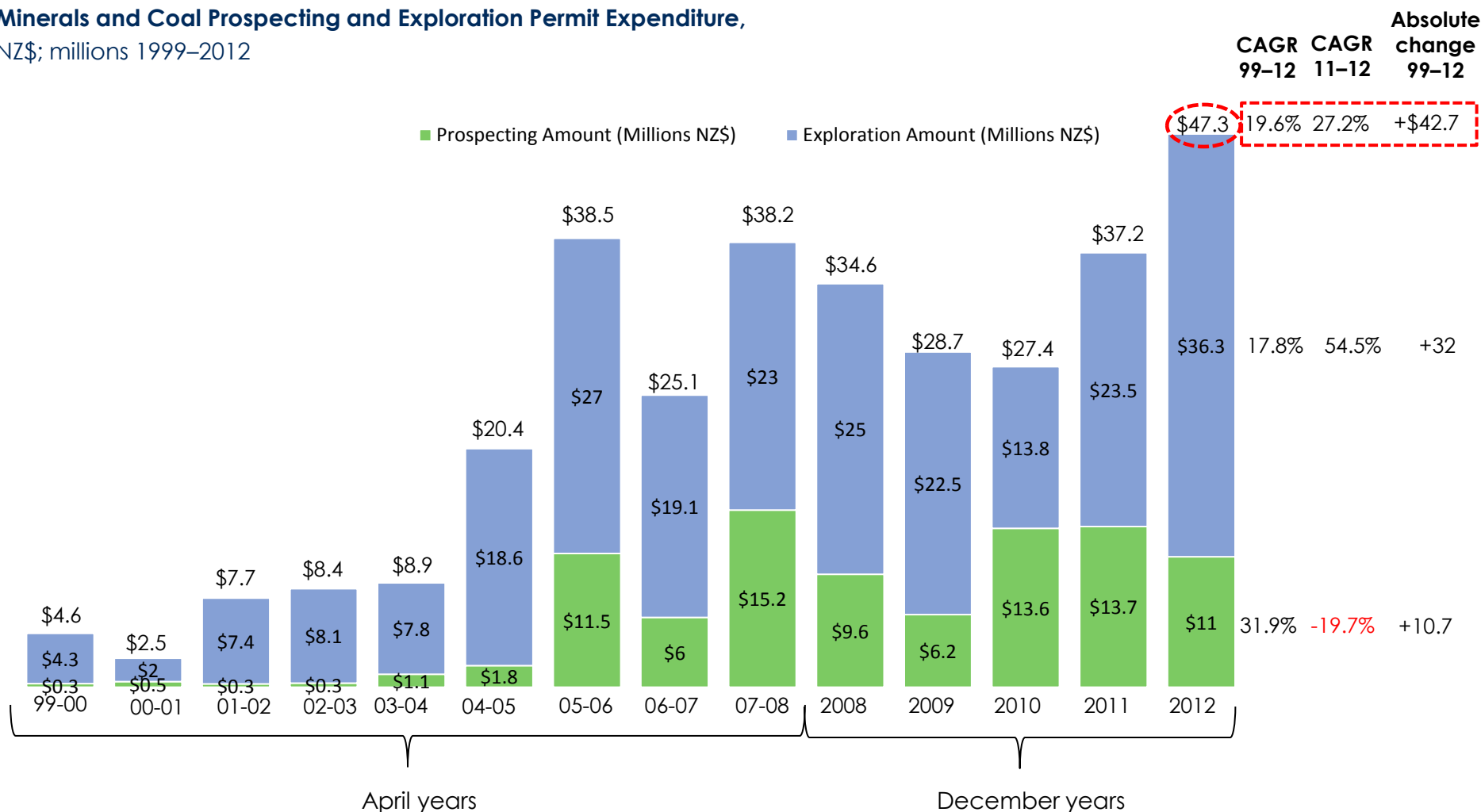


# Minerals and coal prospecting and exploration expenditure

Expenditure on minerals and coal prospecting and exploration is at an historical high

## Minerals and Coal Prospecting and Exploration Permit Expenditure,

NZ\$; millions 1999–2012



## Resources

New Zealand's coal resources are well explored, with limited opportunity for new discoveries

### Known coal resources

2012

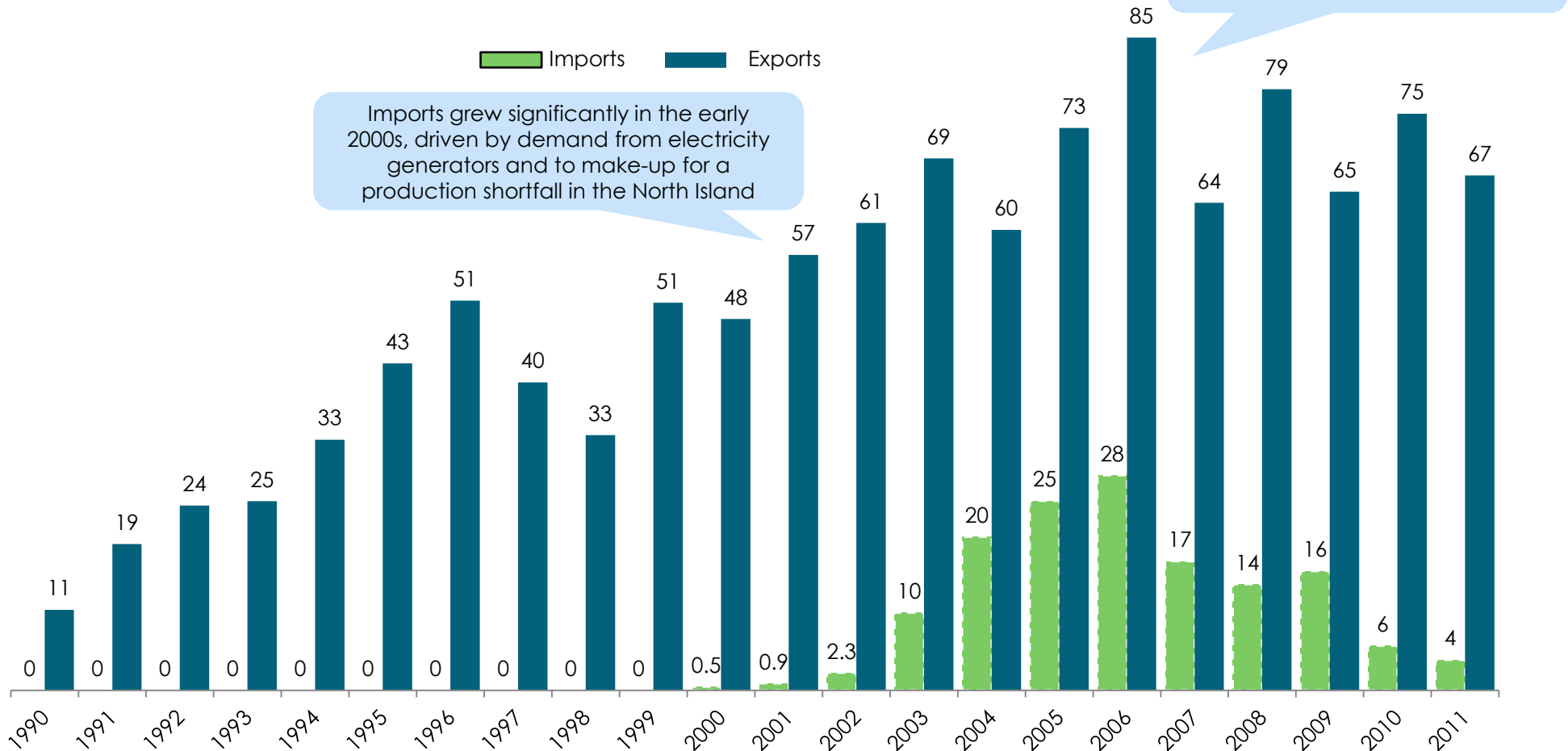
Resources	Tonnes	Details
<b>Total production to date (1860-2012)</b>	200 million tonnes	New Zealand is a minor producer by global standards. <b>Australia produces twice as much coal in a year as New Zealand has in its entire history</b>
<b>Remaining Bituminous and sub-bituminous resources</b>	3.5 billion tonnes	20% of total reserves. Of the remaining bituminous and sub-bituminous coal resources, only a fraction is likely to be recoverable by conventional mining  How much is recoverable is dependent on many factors, including geological and technical difficulty, project consents, market prices and mining economics; much of the easily won coal has already been extracted and underground mining is becoming more technically challenging and expensive
<b>Total in-ground coal resources</b>	15 billion tonnes	Lignite, 80% of total reserves Lignite has potential for conversion to energy products such as fertiliser or liquid fuels, but only at a large scale that may not be economic in the foreseeable future  How much of this is recoverable is dependant on many things, including geological and technical difficulty, project consents and market prices and mining economics

# Exports and imports

New Zealand has a strong trade surplus in coal

## New Zealand coal trade volume: imports & exports

Petajoules; 1990–2011

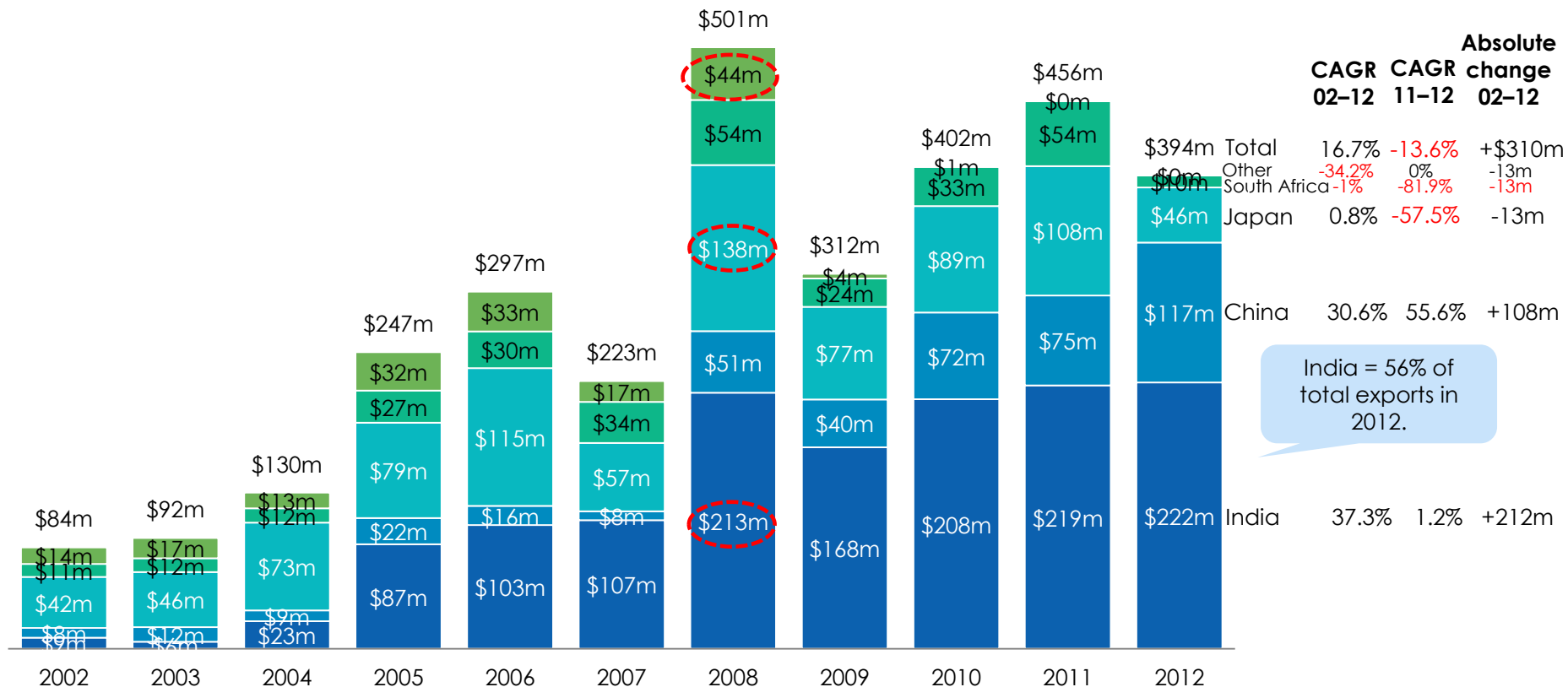


## Coal exports value

The value of New Zealand coal exports peaked in 2008, driven by India and Japan; India has accounted for around 50-60% of exports annually since 2007

### Export value of New Zealand coal by importing country

US\$m: nominal prices; 2002–2012



Source: UN Comtrade Database, imports of HS 2701 Coal; briquettes, etc from New Zealand.

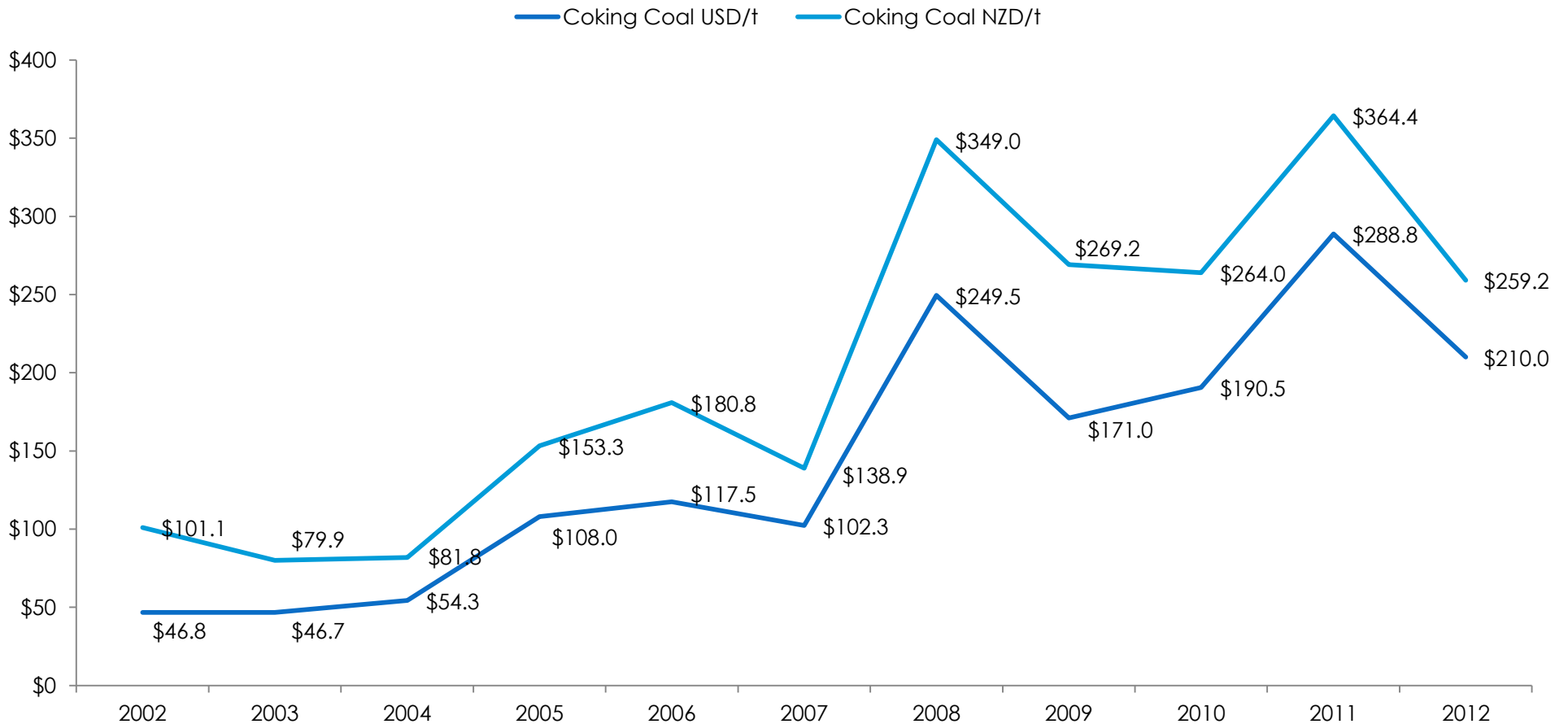
Note: this graph shows the imports of coal from NZ as reported by other countries and may differ from the NZ exports value due to timing and valuation differences. i

## World price

The price of coal has been trending down recently

### Coal prices: coking coal

US\$ /metric ton; Sep 2002 –Aug 2012



## Industry comment:

### Industry commented on the impact of United States unconventional gas production on coal markets

- *In terms of this discussion about shale gas, it has had a profound effect on global prices... which are currently about US\$140 a tonne. But that is to a large extent because shale gas in America has displaced coal use in power stations. And they were burning coke and coal in power stations in America because they were getting a higher return for it. So there's something like 100 odd million tons of capacity of coal that has gone onto the seaborne market, and that has been to a large extent what's driven coke and coal prices down. And that has rippled right through... To a large extent that was actually a shale gas driven effect... it's a big global effect in terms of pricing of both thermal coke and coal, and the consequential effect on New Zealand producers.*
  - CEO, mining company.



## OTHER MINERALS





## Overview

# New Zealand mines a range of other minerals, of which gold and silver generate significant exports

### Gold

In 2012, 11,523 kg of gold was extracted valued at \$653 million. Production was from two large hard rock mines at Waihi (Newmont Waihi Gold) and Macraes Flat (OceanaGold), several medium sized alluvial operations, and a large number of small alluvial mines. Gold is exported to Australia where for further processing before export to third countries.

### Silver

Silver is produced together with gold in the Waihi and Macraes hard rock mines. In 2012 5,630 kg of silver was produced valued at \$6.64 million.

Exports of silver however were recorded as \$104.3 million in 2012, making silver New Zealand's tenth largest export to Australia. The discrepancy between recorded production and recorded exports is because certain alloys that contain both silver and gold are re-classified from gold to silver when exported.

### Ironsand

2,394,848 tonnes of ironsand were reported to have been mined in the 2012 year at the Waikato North Head and Taharoa mines. The value of this production is confidential.

Ironsand is mined for steelmaking in New Zealand (New Zealand Steel) and some is exported.

### Industrial minerals

The total value of all industrial minerals produced in 2012 was just over \$388 million.

Approximately 22 million tonnes of rock, sand and gravel was produced in 2011 (latest data) for use in building, reclamation and protection, road building and industry.

Industrial minerals are used for making glass, steel, paper and cardboard, ink and paint, cosmetics, carpet, and many other items.

A number of other industrial rocks and minerals are produced for local and export markets. They include bentonite, various clays, diatomite, perlite, pounamu, pumice, serpentine, silica and zeolite.

Clays, including bentonite, are used to make; bricks, tiles and pottery, as filters in the manufacture of paper, paint, pharmaceutical and animal health products. It's also used in the production of beer and wine, laundry detergent, sunscreen cream and children's crayons.

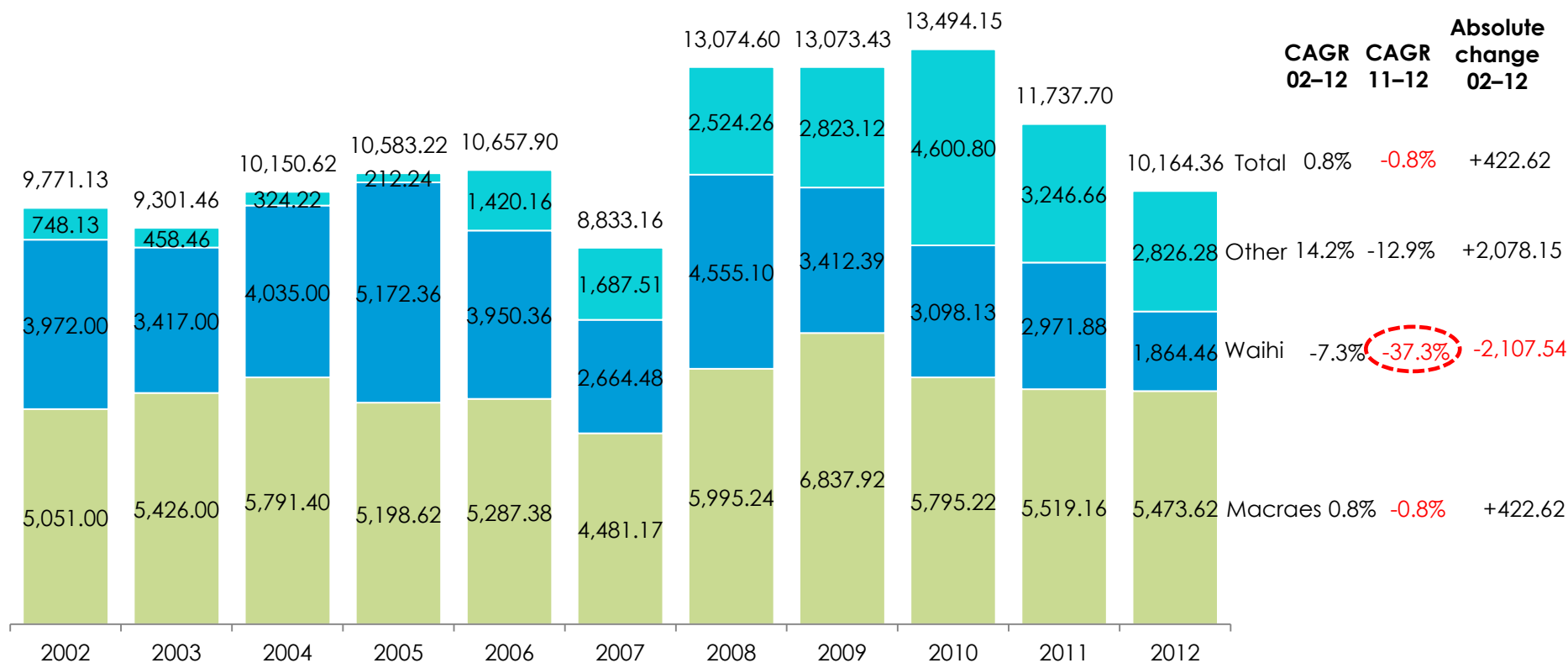
Most of New Zealand's pumice was formed during volcanic eruptions in the last 20,000 years. It is used to manufacture wallboard, plaster, and lightweight concrete. Silica sand is used in bottle glass and window glass manufacture. Other uses include foundry sands and as a filler in the building industry.

# Gold production

Gold production has fallen recently, driven by fall in production at the Waihi mine

## Gold production by location

Kilograms; 2002–2012



**Macraes:** includes production from opencast and underground operations from 2008 onwards.  
**Waihi:** includes production from opencast and underground operations from 2006 onwards.  
**Other:** all other producers.

## Gold prices

Gold prices have been trending down recently; gold has lost 28% of its value from the peak in 2011

### Gold values per ounce

US\$, nominal values, 2001–2013



## Industry comment: outlook for gold

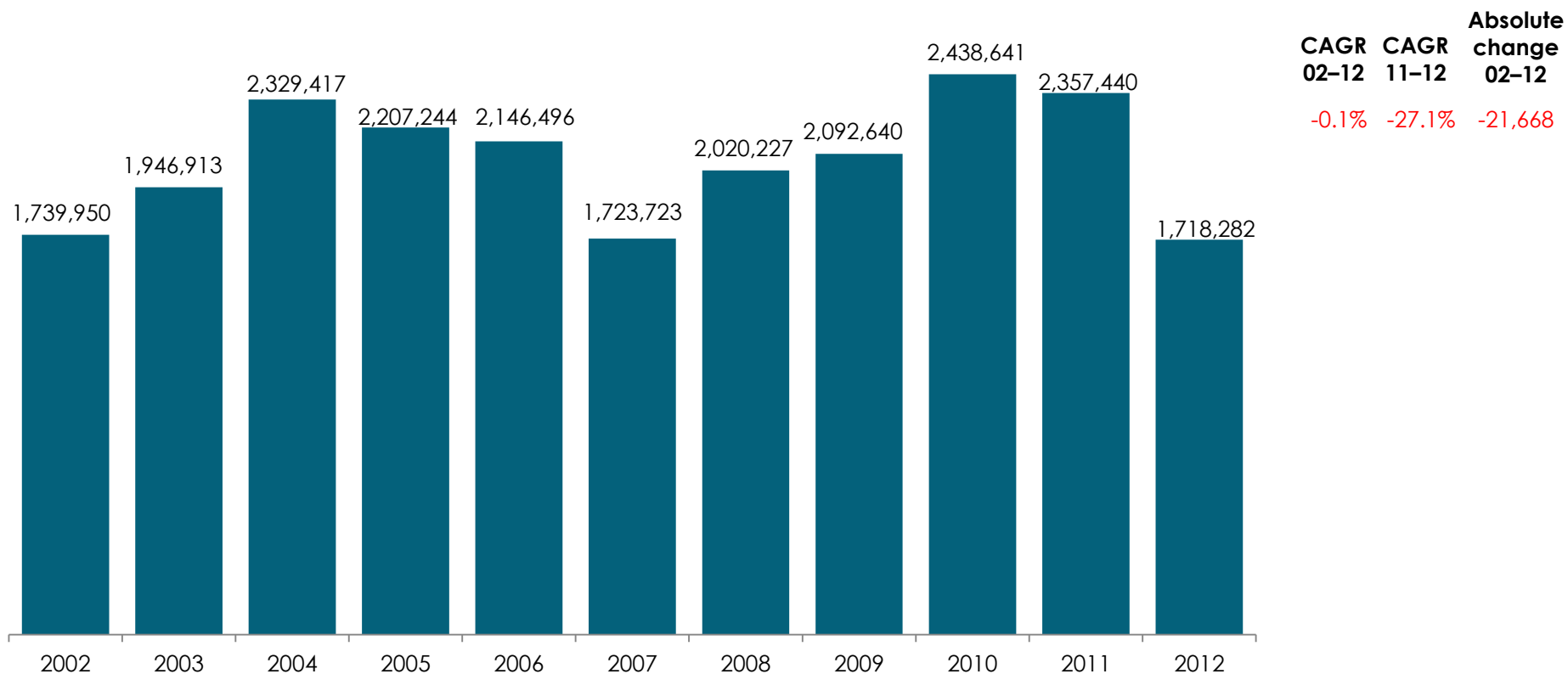
- *Looking at the statistics and the trends at the moment you probably, in the report, say they are all looking really good. I suppose it's just taking that consideration into account when going forward. That the gold industry is going through a bit of a readjustment and to understand that impact when looking at the different things within the report.*
  - Senior executive, minerals sector
- *I have had experience in copper, lead, zinc and silver and there is a general trend globally that all the easy stuff is pretty well found. So now we're using a lot more advanced technology to find deposits which are generally of a lower grade. I suppose what has enabled the mining of the lower grade ore has been the advancement in technologies... to offset [declining grade] operations try and increase production. And that's where you will see gold production declining over the last 5 years generally, because of the lower grade.*
  - Senior executive, minerals sector
- *The issue that we have with a quick downturn [in the price of gold] and the costs is that we've lost \$400 per ounce over almost a month period. Unfortunately our cost base doesn't come down equivalently at the same pace*
  - CEO, senior executive, minerals sector

## Ironsand production

Ironsand production has been relatively stable over the medium-term, but dropped by more than a quarter in 2012.

### Ironsand production

Tonnes; 2000–2011

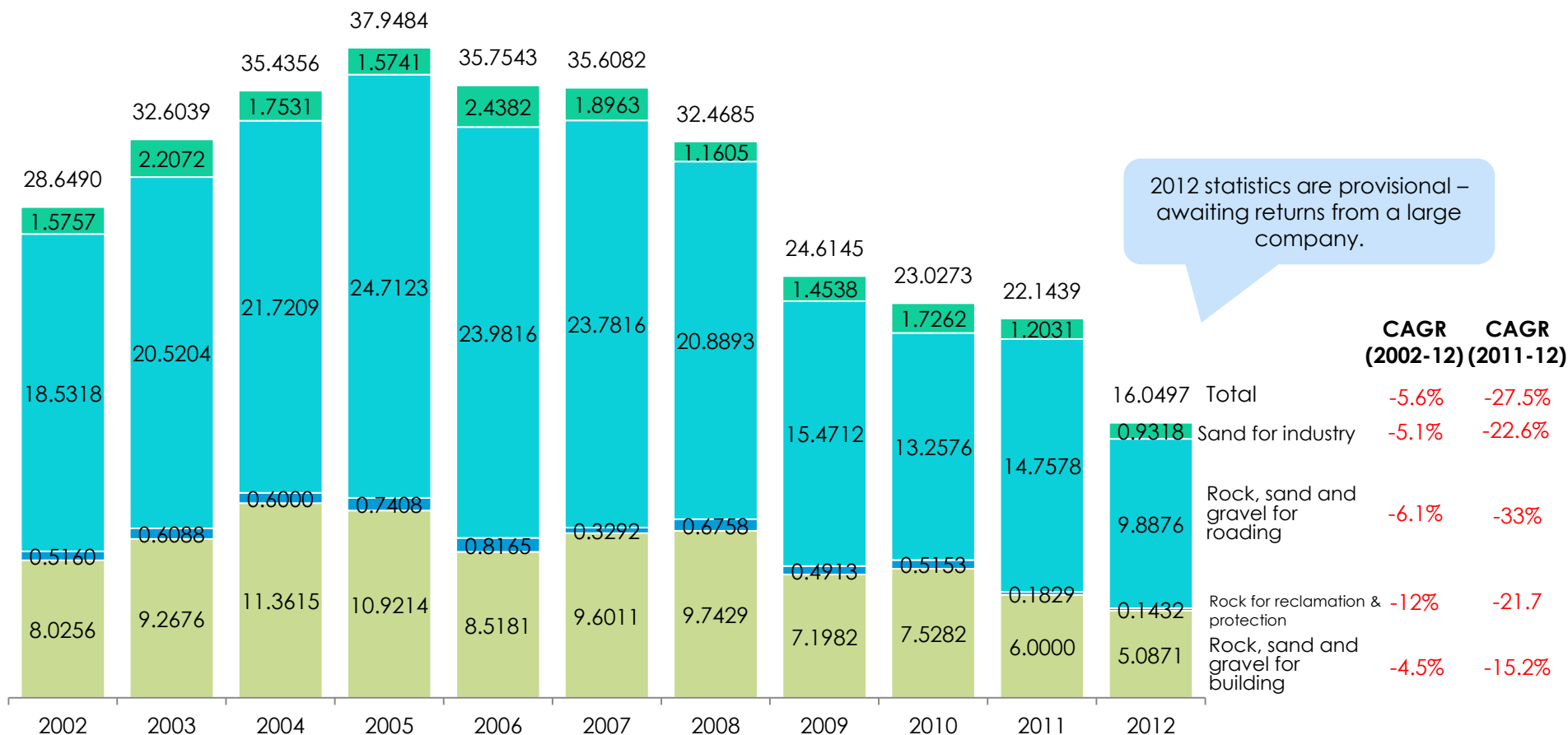


# Aggregate production

Aggregate production has been declining in recent years

## Aggregate production

Tonnes; millions; 2002–2012





## **TRANSACTIONS AND INVESTMENTS**

## Transactions: petroleum and minerals

Mergers and acquisitions are an on-going feature of the industry

### Details of identified transactions in the petroleum & minerals industry in New Zealand

2012

Date	Acquirer	Target	Price (\$NZm)	Details
4 June 2012	TAG Oil (NZ) Limited	TAG Oil (NZ) Limited Exploration Permits 52589, 52676, & 53674	\$2.7	Tag Oil (NZ) Ltd. entered into an agreement to acquire exploration permits 52589, 52676, & 53674 from Rawson Taranaki Limited and Zeanco (NZ) Ltd. Tag Oil paid a 10% deposit on signing the agreement
31 May 2012	New Zealand Energy Corporation (TSXV:NZ)	Origin Energy Resources NZ (TAWN) Ltd., Upstream and Midstream Assets	\$53.9	New Zealand Energy Corporation (TSXV:NZ) entered into an agreed to acquire upstream and midstream assets from Origin Energy Resources NZ (TAWN) Ltd.; under the terms of the agreement, and pursuant to an exclusive arrangement, NZEC agreed to pay NZ\$53.9m in cash and other closing adjustments
15 March 2012	Glass Earth Gold Limited (TSXV:GEL)	Goldmines New Zealand Limited	\$3.5	Glass Earth Gold Limited signed an agreement to acquire Goldmines New Zealand Ltd.; as consideration, Glass Earth will issue approximately 2.2 million shares of its common stock along with NZ\$0.5m cash and a deferred payment of \$NZ2.0m over 25 months commencing July 1, 2012
9 March 2012	Solid Energy New Zealand Limited	Pike River Coal Limited	N/A	Solid Energy New Zealand Limited entered into a conditional sale and purchase agreement to acquire the assets of Pike River Coal Limited from New Zealand Oil & Gas Ltd following the Pike River disaster; as on May 10, 2012, Solid Energy will pay an initial purchase price to PRC of NZ\$7.5m, with NZ\$2.5m payable on signing of the sale agreement, NZ\$1.5m payable on September 30, 2012
9 Jan 2012	SCF Partners; Viburnum Funds Pty Ltd.	Vause Oil Production Services Ltd.	N/A	SCF Partners, Viburnum Funds Pty Ltd. acquired Vause Oil Production Services Ltd; in a related transaction, SCF Partners, Viburnum Funds Pty Ltd. and management acquired Surtron Technologies Pty Ltd. from Viburnum Funds Pty Ltd.; SCF Partners and Viburnum will be the majority shareholders in Vautron Group



## Transactions: petroleum and minerals *continued*

### Details of identified transactions in the petroleum and minerals industry in New Zealand

2011

Date	Acquirer	Target	Price (\$NZm)	Details
27 Oct 2011	Loyz NZ Ventures Limited	STP Energy Pte. Ltd., Petroleum Exploration Permit within Taranaki Basin	\$7.9	Loyz Oil Pte. Ltd. entered into a binding memorandum of understanding to acquire petroleum exploration permit within Taranaki Basin from STP Energy Pte. Ltd. on October 26, 2011; Loyz Oil will pay \$NZ1.5m as a part of consideration; the amount of NZ\$1.5m shall be refunded to Loyz Oil in case of termination of the transaction
25 Oct 2011	Webster Drilling and Exploration Limited	Petra Drilling Limited	\$0.4	Webster Drilling and Exploration Limited signed an agreement to acquire the remaining 50% stake in Petra Drilling Limited from Kea Petroleum PLC; Webster Drilling and Exploration Limited paid the consideration for the loan and the shares
18 Aug 2011	Au Mining Ltd	Navigator Resources Ltd	\$3.5	Au Mining Ltd of New Zealand acquired a 5.5% stake, or 115.2 mil ordinary shares, in Navigator Resources Ltd, a Perth-based gold and rare earth mining company, for NZ\$3.5m in cash, in a privately negotiated transaction
6 July 2011	OMV New Zealand Ltd.; Octanex NZ Limited	PEP 53537 in Offshore Taranaki Basin	N/A	Octanex NZ Limited and OMV New Zealand Ltd. acquired the PEP 53537 in offshore Taranaki Basin on July 5, 2011; Octanex NZ will hold 35% stake and OMV New Zealand Ltd. will hold 65% stake in PEP 53537
3 May 2011	Buller Coal Holdings Ltd.	Coal Mining Permits, Related Access Agreements, Consents and Records on Buller Plateau	\$27.1	Buller Coal Holdings Ltd. signed a sale and purchase agreement to acquire coal mining permits and related access agreements, consents and records on Buller Plateau from Robert James Griffiths and Brookdale Mining Limited NZ for NZ\$27.1m on May 3, 2011; Buller Coal will pay NZ\$12.0m and issue 15 million fully paid ordinary shares of Bathurst Resources Ltd, parent of Buller Coal
4 March 2011	Taranaki Ventures Limited	Green Gate Ltd., PEP 51150	N/A	Taranaki Ventures Limited acquired PEP 51150 from Green Gate Ltd on March 3, 2011

## Transactions: petroleum and minerals *continued*

### Details of identified transactions in the petroleum and minerals industry in New Zealand

2010

Date	Acquirer	Target	Price (\$NZm)	Details
1 Dec 2010	Olympus Pacific Minerals NZ	Zedex Minerals Ltd	\$46.8	Olympus Pacific Minerals NZ Ltd, a wholly-owned unit of Olympus Pacific Minerals Inc (Olympus), merged with Zedex Minerals Ltd (Zedex), an Auckland-based mineral exploration company, in a stock swap transaction valued at NZ\$46.8m
28 Oct 2010	Au Mining Ltd	Atlantic Gold NL	\$3.2	Au Mining Ltd of New Zealand acquired a 9.2% stake, or 40 million new ordinary shares, in Atlantic Gold NL, a Crows Nest-based gold mining company, for NZ 0.08 in cash per share, or a total value of NZ\$3.2m, in a privately negotiated transaction
25 Feb 2010	Bathurst Resources Ltd (ASX:BTU)	L&M Energy Limited (NZSE:LME) Buller Coal Holdings Ltd.	\$174.7	Bathurst Resources Ltd signed a letter of intent to acquire L&M Coal Ltd. from L&M Energy Limited on February 24, 2010; the acquisition would lead to the formation of a joint venture to acquire coking coal asset in the Buller coal field of L&M Coal Ltd. in New Zealand
4 Jan 2010	Aotea Energy Holdings Ltd	New Zealand Refining Co Ltd	\$127.7	Aotea Energy Ltd (Aotea), a joint venture between Infratil Ltd and state-owned New Zealand Superannuation Fund, acquired a 17.14% stake, or 48 million ordinary shares, in New Zealand Refining Co Ltd, a manufacturer and wholesaler of petroleum products, from Shell New Zealand Holdings Ltd (Shell NZ), a unit of Royal Dutch Shell PLC, in a privately negotiated transaction; Concurrently, Aotea acquire the downstream business of Shell NZ
3 Jan 2010	L&M Petroleum Ltd	L&M Coal Seam Gas Ltd	\$69.3	L&M Petroleum Ltd (L&M) agreed to acquire the entire share capital of L&M Coal Seam Gas Ltd, an oil and gas exploration and production company, in exchange for \$444m L&M new ordinary shares valued at NZ\$69.3m; the shares were valued based on L&M's closing stock price of NZD 0.156 on 23 December 2009, the last full trading day prior to the announcement

## Investments: petroleum and minerals

The sector has attracted significant on-going investment

### Details of identified investments in the petroleum and minerals industry in New Zealand

March 2012–July 2012

Date	Company	Investment	Activity	Details
27 Jul-12	Royal Boskalis Westminster N.V	Chatham Rock Phosphate.	Purchase of 20% shareholding.	<p>Chatham Rock Phosphate holds the prospecting rights, awarded by the NZ Government in 2010 for two 2-year terms; CRP also has priority rights to apply for a mining licence after meeting exploration work programme obligations</p> <p>Current work includes designing an extraction method with partner Royal Boskalis Westminster, environmental data collection and monitoring and financing to the stage of a commercial production decision; Royal Boskalis Westminster N.V. is a leading global services provider operating in the dredging, maritime infrastructure and maritime services sectors</p>

## Investments: petroleum and minerals, *continued*

### Details of identified investments in the petroleum and minerals industry in New Zealand

Oct 2011–Feb 2012

Date	Company	Investment	Activity	Details
16-Mar-12	New Zealand Oil and Gas	Permit Investment	Purchase	<i>NZOG (New Zealand Oil &amp; Gas Ltd) is pleased to advise that it has today signed a conditional agreement to purchase a 15% stake in the Kaheru permit (Petroleum Exploration Permit 52181) off the south Taranaki coast. The agreement is with AGL Upstream Gas (MOS) Pty Ltd, a wholly owned subsidiary of AGL Energy Ltd.</i> – press release
10-Mar-12	Tag Oil	Infrastructure	Expansion programme	TAG Oil announces that the Company is initiating a NZ\$66m capital expenditure program within the 100%-controlled Cheal and Sidewinder fields in the Taranaki Basin, New Zealand. This program consists of continued high-impact exploration and development drilling targeting the shallow (~2000m) oil prone zones, deeper drilling (~4000m) targeting large liquids-rich gas prospects and various work over operations to existing wells. In addition, TAG will also expand the Company's 100%-owned production infrastructure in order to bring additional production on-stream arising from new discoveries and production that currently sits behind pipe. This capital expenditure program will be funded from existing working capital and revenues from current oil and gas production (Transaction is now completed).
5-Jun-10	Solid Energy	Equipment	Purchase	Solid Energy purchased 95 pieces of caterpillar machinery, worth NZ\$121m for its Stockton opencast coal mine north of Westport. The purchase was made up of two contracts of similar sizes. The total purchased comprised of 58 trucks, 19 excavators, five tracked and three wheeled bulldozers, seven wheel loaders and three motor graders.
4-Nov-2009	Contact Energy & Origin Energy	Storage Facility	Development	The Ahuroa gas storage facility was developed for NZ\$250m. This will enable Contact to take natural gas during periods when the market doesn't require it and store it underground for use during peak gas and electricity demand periods



**APPENDIX:  
GLOSSARY, METHODOLOGY, DATA  
SOURCES AND LIMITATIONS**

## Glossary of terms

This report uses the following acronyms and abbreviations

A\$/AUD	Australian dollar	NZ	New Zealand
ABS	Absolute	n/a	Not available/not applicable/no data
ANZSIC	Australia and New Zealand Standard Industry Classification	NZ\$/NZD	New Zealand dollar
AR	Annual report	Oceania	NZ, Australia & Pacific Islands
ASEAN	Association of Southeast Asian Nations	RoE	Return on equity
AU	Australia	R&D	Research & Development
Australasia	Australia and New Zealand	S Asia	South Asia (Indian sub-continent)
b	Billion	SE Asia	South East Asia
CAGR	Compound annual growth rate	SOE	State Owned Enterprise
C/S America	Central and South America (Latin America)	T/O	Turnover
CRI	Crown Research Institute	US/USA	United States of America
CY	Calendar years	US\$/USD	United States Dollar
E. Asia	East Asia	UK	United Kingdom
EBITDA	Earnings before interest, tax, depreciation and amortisation	YE	Year ending
EC	Employee count, headcount of salary and wage earners sourced from taxation data	YTD	Year to date
FTE	Full-time equivalent		
FY	Financial year		
GFC	Global financial crisis		
JV	Joint venture		
m	Million		

## Terms and definitions

The report uses the following economic metrics

Term	Definition	Comment
<b>Nominal GDP (gross domestic product)</b>	The value of goods and services produced in New Zealand, after deducting the cost of goods and services used in the production process. 'Nominal' means not adjusted for inflation.	<b>Cross-cutting sectors (excluding tourism)</b> Value added has been used to provide indicative estimates. These have not been verified through the System of National Accounts.
<b>Real GDP (gross domestic product)</b>	GDP adjusted to remove the effect of price changes/inflation to show the change in the volume of goods and services produced in New Zealand. In this report, it is expressed in constant 2010 prices.	<b>Cross-cutting sectors (excluding tourism)</b> Data not available.
<b>Goods exports</b>	The value of goods of domestic origin (excluding re-exports) exported from New Zealand to another country. Note: sector exports values will exclude items suppressed in accordance with Statistics NZ's confidentiality policy. Exclusions are noted where applicable.	<b>All sectors:</b> Merchandise (goods) exports have been obtained by matching commodities to the ANZSIC06 industry that characteristically produces them (Statistics NZ custom job).
<b>Employment</b>	The number of people who earned money from employment (wages and salary earners) and/or self-employment. For tourism it is full-time equivalent (FTE) employees producing goods and services sold directly to tourists.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Linked Employee Employer Database (LEED), ( custom job). <b>Tourism</b> Direct employment in tourism (FTEs) and employment (FTEs) in tourism as a % of total.
<b>Productivity</b>	A measure of how efficiently inputs are used within the economy to produce outputs. Productivity is calculated by dividing the sector's real GDP by the number of hours paid. Real GDP per hour paid is used. For the cross-cutting sectors nominal GDP per employee is substituted.	<b>Cross-cutting sectors (excluding tourism)</b> For cross-cutting sectors real GDP is replaced by nominal GDP, and hours paid is replaced by number of employees; hence calculation is nominal GDP by number of employees.
<b>Investment in fixed assets (gross fixed capital formation)</b>	A measure of the outlays of producers on durable fixed assets (e.g. buildings, vehicles, plant and machinery, hydro-electric construction, roading and improvements to land). 'Gross' indicates that consumption of fixed capital is not deducted from the value of the outlays.	<b>Cross-cutting sectors (excluding tourism)</b> Uses additions less disposals of fixed assets, (custom job). Note: this data has not been through the System of National Accounts, so is indicative only.
<b>Number of firms (number of enterprises)</b>	The number of businesses or service entities operating in the sector in New Zealand. It covers all types of business or service entities, including companies, self-employed individuals, voluntary organisations and government departments.	<b>Cross-cutting sectors (excluding tourism)</b> Uses customised Business Demography Statistics, number of enterprises.

## Terms and definitions

The report uses the following financial metrics

Term	Definition	Comment
<b>Total income per firm</b>	Total income of all firms in sector divided by the number of firms in the sector. Income includes sales, interest, dividends, donations, government funding, grants and subsidies, and non-operating income.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Annual Enterprise Survey statistics, custom job.
<b>Total income per employee:</b>	Total income of all firms in sector divided by rolling mean employment. Total income includes sales, interest, dividends, donations, government funding, grants and subsidies, and non-operating income.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Annual Enterprise Survey statistics, custom job.
<b>Surplus per employee:</b>	Surplus before income tax of all firms in sector divided by rolling mean employment.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Annual Enterprise Survey statistics, custom job.
<b>Return on equity</b>	Surplus before income tax divided by shareholders' funds.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Annual Enterprise Survey statistics, custom job.
<b>Capital stock per worker</b>	Indicates capital intensity. The capital stock includes fixed assets such as buildings, roads and machinery, and intangible items such as software and exploration expenditure, less accumulated depreciation.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Annual Enterprise Survey statistics, custom job. <b>Tourism:</b> Capital stock, divided by employment.
<b>Debt ratio</b>	Debt ratio equals total liabilities of all firms in sector divided by total assets of all firms in sector.	<b>Cross-cutting sectors (excluding tourism)</b> Statistics NZ, Annual Enterprise Survey statistics, custom job.



## Sources: economic data

The following sources were used for economic data

Metric	Source Standard ANZSIC sectors	Source tourism	Source ICT
<b>Nominal GDP</b>	Statistics New Zealand, Infoshare Database, System of National Accounts 1993, SND, GDP(P), Nominal, Actual, ANZSIC06 industry groups (Annual–Mar).	Statistics NZ, Tourism Satellite Account: 2012, Table 1 Tourism expenditure by component, Direct tourism value added.	Statistics NZ, Value added estimates from customised Annual Enterprise Survey tables. Note: this data has not been through the System of National Accounts, so is indicative only.
<b>Real GDP</b>	Statistics New Zealand, Infoshare Database, National Accounts, System of National Accounts 1993, SND, GDP(P), Chain-volume, Actual, ANZSIC06 industry groups (Annual– k Mar). Adjusted so that 2010 real GDP = 2010 Nominal GDP. Does not incorporate revisions published by Statistics NZ in December 2012.	n/a	
<b>Goods exports</b>	Statistics NZ, merchandise exports, obtained by matching commodities to the ANZSIC06 industry that characteristically produces them. Note: sector exports values will exclude items suppressed in accordance with Statistics NZ's confidentiality policy. For more information, see <a href="http://www.stats.govt.nz/about_us/policies-and-protocols/trade-confidentiality.aspx">http://www.stats.govt.nz/about_us/policies-and-protocols/trade-confidentiality.aspx</a>		Statistics NZ, merchandise exports, obtained by matching commodities to the ANZSIC06 industry that characteristically produces them.

## Sources: economic data *continued*

Metric	Source standard ANZSIC sectors	Source Tourism	Source ICT
<b>Employment</b>	Statistics New Zealand, Table Builder, Linked Employer-Employee Data (LEED) Tables (annual), Table 1.6: Main Earnings Source by Industry (NZSIOC).	Statistics NZ, Tourism Satellite Account: 2012, Table 4, Direct employment in tourism (FTEs) and Employment (FTEs) in tourism as a percentage of total. See <a href="http://www.stats.govt.nz/browse_for_stats/industry_sectors/Tourism/tourism-satellite-account-2012/tourism-employment.aspx">http://www.stats.govt.nz/browse_for_stats/industry_sectors/Tourism/tourism-satellite-account-2012/tourism-employment.aspx</a> for more information on the tourism FTE measure.	Statistics NZ, LEED custom job.
<b>Productivity</b>	Real GDP divided by hours paid. Hours paid data from Statistics NZ, Infoshare Database, Productivity Input Series – Industry Level (ANZSIC06) (Annual–Mar), Hours, Gross. Manufacturing hours paid for 2010 split into manufacturing sub-sectors using QES hours paid and rated back using productivity indexes from Statistics NZ.	Substituted nominal GDP per employee.	Substituted nominal value added/employment.
<b>Investment in fixed assets</b>	Statistics New Zealand, Infoshare database, System of National Accounts 1993 - SND, Series, GDP(E), Nominal, Actual, Asset type (Annual–Mar), Gross Fixed Capital Formation.	Statistics NZ, Tourism Satellite Account - TSA, Table: Gross Fixed Capital Formation by Asset Type and by Industry (ANZSIC06) (Annual–Mar). NB data only available for certain years up to 2009.	Statistics NZ, Additions less disposals of fixed assets from customised Annual Enterprise Survey tables. Note: this data has not been through the System of National Accounts, so is indicative only. The all sector total excludes some industries – see note page following.
<b>Number of firms</b>	Statistics NZ Table Builder, Business Demography Statistics, Detailed Industry for Enterprises, number of enterprises.	n/a	Customised Business Demography Statistics, number of enterprises.

## Sources: financial data

The following sources were used for financial data

Metric	Source standard ANZSIC sectors	Source Tourism	Source ICT
<b>Surplus per employee</b>	Statistics NZ, Annual Enterprise Survey release, surplus per employee count. The all sector total excludes some industries. See note below.	n/a	Statistics NZ, Customised Annual Enterprise Survey data, surplus per employee count.
<b>Return on equity</b>	Statistics NZ, Annual Enterprise Survey release, return on equity. Total excludes some industries – see note below.	n/a	Statistics NZ, Customised Annual Enterprise Survey data, return on equity.
<b>Debt ratio</b>	Statistics NZ, Annual Enterprise Survey release, total liabilities (current and other) divided by total assets. The all sector total excludes some industries. See note below.	n/a	Statistics NZ, customised Annual Enterprise Survey data, total liabilities (current and other) divided by total assets.
<b>Capital stock per worker</b>	Statistics NZ, National Accounts (Industry Benchmarks): Year ended March 2010, Table 14 Net capital stock by industry, current prices (replacement cost), 1987–2010, divided by employment.	Statistics NZ, Tourism Satellite Account, capital stock, divided by employment. Note: capital stock data is only available for some years up to 2009 and does not incorporate the National Accounts revisions published in November 2012.	Substituted with fixed assets per worker from Statistics NZ, Customised Annual Enterprise Survey data, fixed tangible assets divided by employment. Note: the fixed assets data has not been through the system of National Accounts, so is indicative only. The all sector total excludes some industries - see note below.

**Note: AES data excludes residential property operators, foreign government representation, religious services, private households employing staff and superannuation funds.**

# Business Operations Survey, 'example' firms and other sources

## Business Operations Survey

The Business Operations Survey collects information on the operations of New Zealand businesses. This information is used to quantify business behaviour, capacity, and performance. The survey gives insights into business activities, barriers and motivations behind New Zealand business operations.

Data from the Business Operations Survey was used to calculate:

- barriers to innovation and exporting
- rates of innovation and R&D by sector
- the rate of outward direct investment and foreign direct investment by sector
- percentage of firms in a sector reporting overseas income

## Size of business operations survey

The survey is run annually and typically information is collected from approximately 36,000 firms operating in New Zealand with six employees or more.

## Customised data for the Sectors Report

Data for the cross-cutting sectors, information and communications technology, high technology manufacturing, tourism, knowledge intensive services and some of the manufacturing sectors was provided by Statistics NZ as a custom job. This data may be below the level the survey is designed for and so should be treated with caution.

Detailed information on the Business Operations Survey is available from the [www.stats.govt.nz](http://www.stats.govt.nz)

## Example firms: sources and limitations

The example firms are sourced from the Kompass database (quoted with permission) Management Magazine's top 200 firms (2012) plus various websites, annual reports and the TIN 100 publication (2012).

Firms allocated to sectors in this report may not match firms included in official statistics. Statistics NZ does not release firm level data. In most cases numbers employed and turnover quoted for example firms are estimates.

## MBIE welcomes corrections to the example firms' data.

## Other sources

Other data sources, such as the Comtrade database, are noted on the page on which they occur.

## Exports by sector limitations

This report attributes exports to sectors by mapping products and services to the sector most likely to produce them

### Classifying exports by sector

Statistics on exports are collected according to product or service type and not according to the sector that generates the exports.

Statistics New Zealand collects goods trade statistics using the New Zealand Harmonised System Classification 2012 (NZHSC). This is based on the World Customs Organization's (WCO) Harmonized Commodity Description and Coding System (HS).

Firms are classified into sectors using the Australia and New Zealand Industrial Classification (ANZSIC) system.

To obtain insight into the export performance of sectors for this report, Statistics New Zealand prepared a concordance that maps HS codes (how goods exports are classified) to ANZSIC codes (how sectors are classified).

This concordance allocates exports to sectors based on the **type of product the sector is most likely to produce**. Hence logs and fruit are attributed to the agriculture, forestry & fishing sector, while sawn wood products are attributed to the wood & paper sector, and milk powder and frozen beef are attributed to food & beverage manufacturing.

### Treat with caution

The export data for sectors provided in this report is believed to be broadly correct, but should be treated with caution. The method used means that some sectors which clearly do export, have no or few exports allocated.

The clearest example is the wholesaling sector. Many wholesalers operating in New Zealand export products on behalf of the producers of those products, or purchase and on-sell them overseas. These exports are attributed to the sector that manufactured, grew, harvested or mined them, rather than to the wholesaling sector. Experimental data from Statistics New Zealand indicates that the value of goods exports by wholesale trade firms was around \$8b in 2011.

### Petroleum and minerals sector exports

The HS code / ANZSIC code concordance prepared by Statistics NZ has gold and silver exports allocated to the metals manufacturing sector. To provide a more complete picture in this report gold and silver exports are included in the calculation of petroleum and minerals sector exports.

The value of New Zealand's coal exports is confidential. However, data is provided on the value in US dollars of imports of New Zealand coal by other countries.

### Services exports

Statistics New Zealand publishes services exports data by service type as part of its balance of payments statistics every quarter. These are calculated using a variety of different surveys and administrative data sources.

In this report, we have allocated exports of transportation, insurance and government services not included elsewhere to the logistics, finance & insurance, and government sectors respectively.

Commercial services by sector came from an industry breakdown from the Census of International Trade in Services and Royalties: Year ended June 2011 (not available for 2012).

There is no breakdown of travel exports by sector. Travel exports includes all spending on goods and services by non-resident visitors to New Zealand. It overlaps considerably with tourism exports (see below), but includes spending by international students here for more than a year as well as those here for up to a year (whereas tourism only includes those here for up to a year) and excludes tourists' international airfares (which are included in tourism, but are part of transportation exports in the Balance of Payments).





## **FURTHER READING**

## Further reading: information on the New Zealand economy

Publication	Available from
<b>Petroleum and minerals sector</b>	
<b>Energy in New Zealand, 2013</b> Comprehensive statistics on New Zealand's production and consumption of all forms of energy.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>New Zealand Petroleum and Minerals website</b> Comprehensive information, factsheets and data sets on New Zealand's petroleum and minerals sector, including detailed information for industry.	<a href="http://www.nzpm.govt.nz">www.nzpm.govt.nz</a>
<b>New Zealand economy</b>	
<b>The Regional Economic Activity Report, 2013</b> The Regional Economic Activity Report presents available official economic data on New Zealand's 16 regions. The report, which will be annual, provides regional economic information sourced from a number of government agencies.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>Situation and Outlook for Primary Industries (SOPI) 2012</b> Published annually, this report provides up-to-date information about the performance of New Zealand's primary sectors – dairy, meat and wool, forestry, horticulture, arable and, for the first time, seafood – and gives independent forecasts of future prospects.	<a href="http://www.mpi.govt.nz">www.mpi.govt.nz</a>
<b>The Food and Beverage Information Project reports</b> The project pulls together all the available information on the food and beverage industry into one place, in a form which is familiar and useful to business. Over 20 reports are available on every aspect of New Zealand's food industry, including information on export market and investment opportunities. New and updated reports are released annually.	<a href="http://www.foodandbeverage.govt.nz">www.foodandbeverage.govt.nz</a>





## Further reading: the Government's Business Growth Agenda reports

Publication	Available from:
<b>Building innovation</b> The building innovation work stream of the Business Growth Agenda aims to grow New Zealand's economy by encouraging and enabling investment in research and development, and lifting the value of public investments in science and research.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>Export markets</b> The export markets work stream of the Business Growth Agenda aims to increase exports by New Zealand businesses, which is necessary to lift New Zealand's economic growth and living standards.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>Building infrastructure</b> The building infrastructure work stream of the Business Growth Agenda aims to provide the physical platform that will support sustained economic growth.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>Natural resources</b> The Building Natural Resources work stream of the Business Growth Agenda aims to make better use of New Zealand's abundant natural resources, so we can continue to grow our economy and look after our environment.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>Skilled and safe workplaces</b> The skilled and safe workplaces work stream of the Business Growth Agenda aims to improve the safety of the workforce and build sustained economic growth through a skilled and responsive labour market.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>
<b>Building capital markets</b> The building capital markets work stream of the Business Growth Agenda aims to ensure New Zealand has high performing capital markets that support investment, growth and jobs.	<a href="http://www.mbie.govt.nz">www.mbie.govt.nz</a>

The Ministry of Business, Innovation & Employment (MBIE) welcomes comment and feedback on this report, and on the measures the Government is taking to facilitate the development of a competitive and successful petroleum and minerals sector.

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