


A REVIEW OF OIL VOLATILITY ON NEW ZEALAND FUNDING OF ROAD INFRASTRUCTURE (2006 – 2009)

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The views expressed are those of the author and do not necessarily reflect those of Beca or any other organisation or agency.

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Since 2006 the world has undergone significant transformation – world economy has experienced the worst recession since the 1930's and a significant oil price shock occurred in Mid-2008.

Questions

How is our Transportation Infrastructure affected by World Oil Prices?

What was the NZ impact of rising world Oil prices in 2008?

What is the current State of Managing Road Infrastructure Pricing?

What opportunities do we have to manage the risk of Volatile Oil Prices?

What could the future picture look like and how should we respond?

Common Topic for Presentations and Conferences

Cost of **Bitumen Asphalt, Cement binder, Steel**, and **Oil** inputs into the transport, construction, and operations for Roadway Construction.

- These inputs are Energy Intensive and require substantial Oil input throughout their life cycle. Especially during the creation of Asphalt Binder and Cement.

Cost of Bitumen

–NZ contractors cannot effectively manage the risk of cost fluctuations in bitumen

–International Price volatility

–Some hedging options, but size of contracts and timing detract from benefit

–Bitumen Index has been a worthwhile tool to reduce contractor risk but it must relate to bitumen volume used (more risk, greater volumes, etc.)

Rising Cost of Steel

–Increased by 75 -100% in 2008

–Resulting cost of steel fabrications +20%

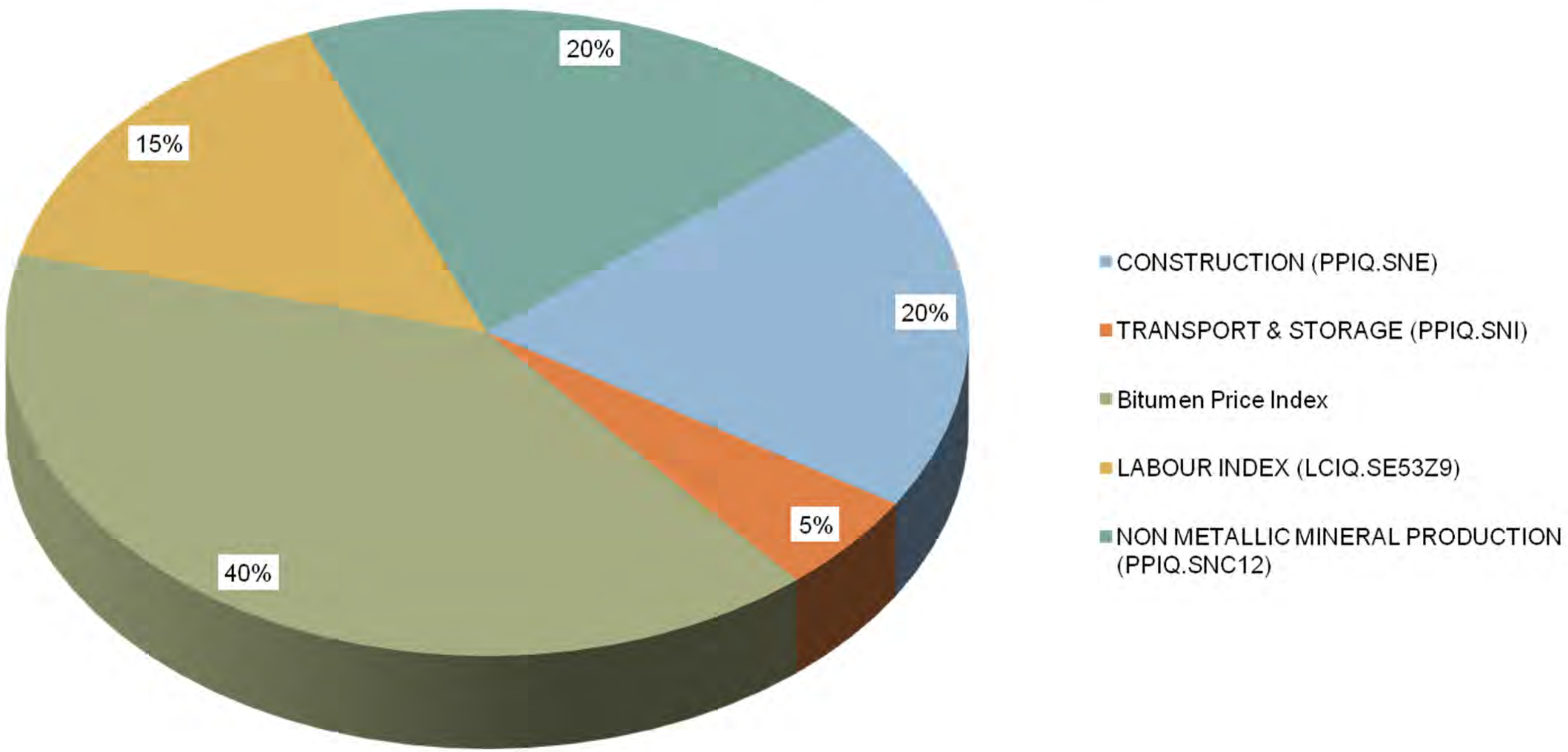
–Resulting cost of reinforced concrete +12% - 14%

Cost of Fuel

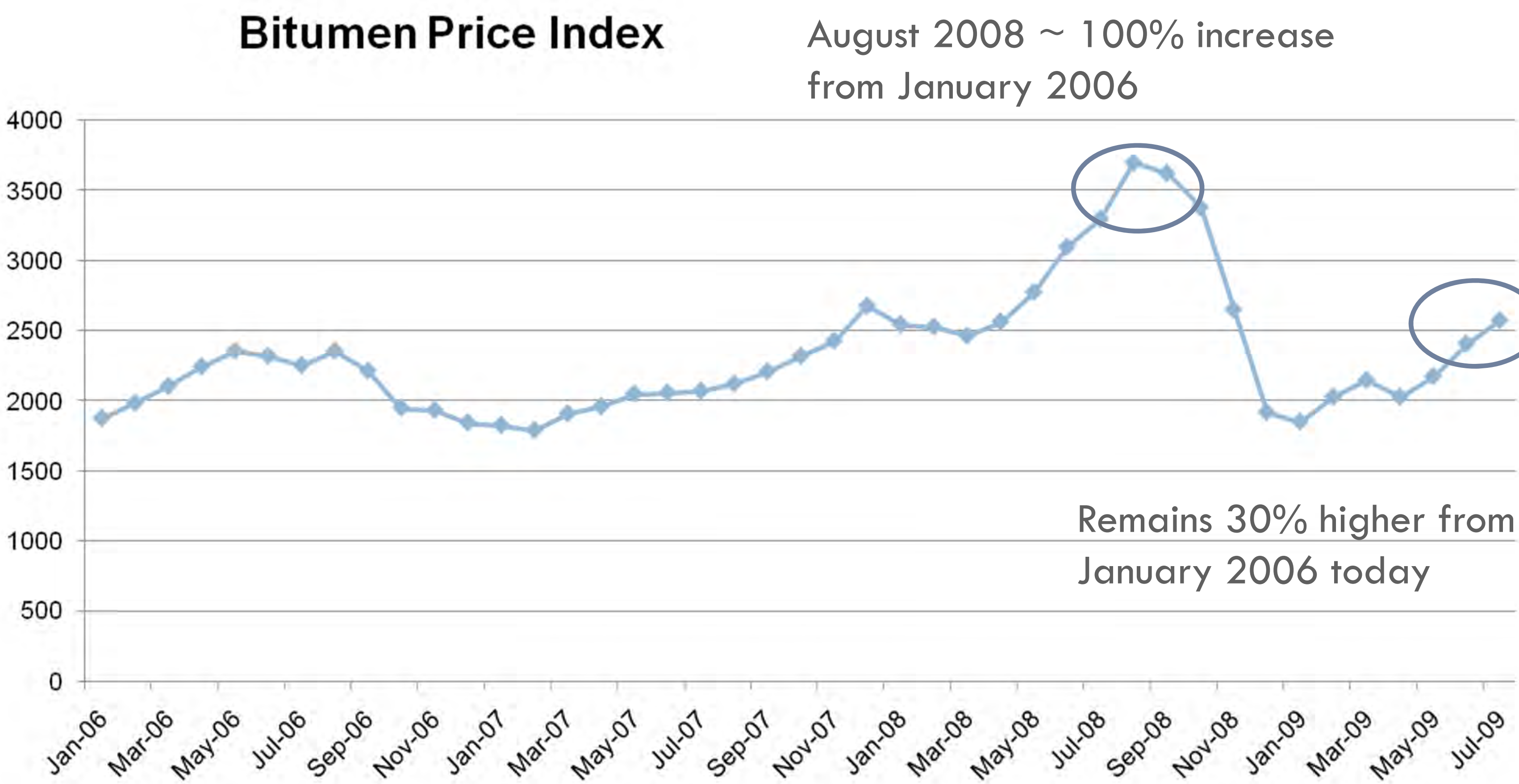
–This has increased bulk earthworks rates by 16%

–Recent decrease but still volatile

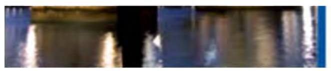
Resealing Price Adjustment Factors

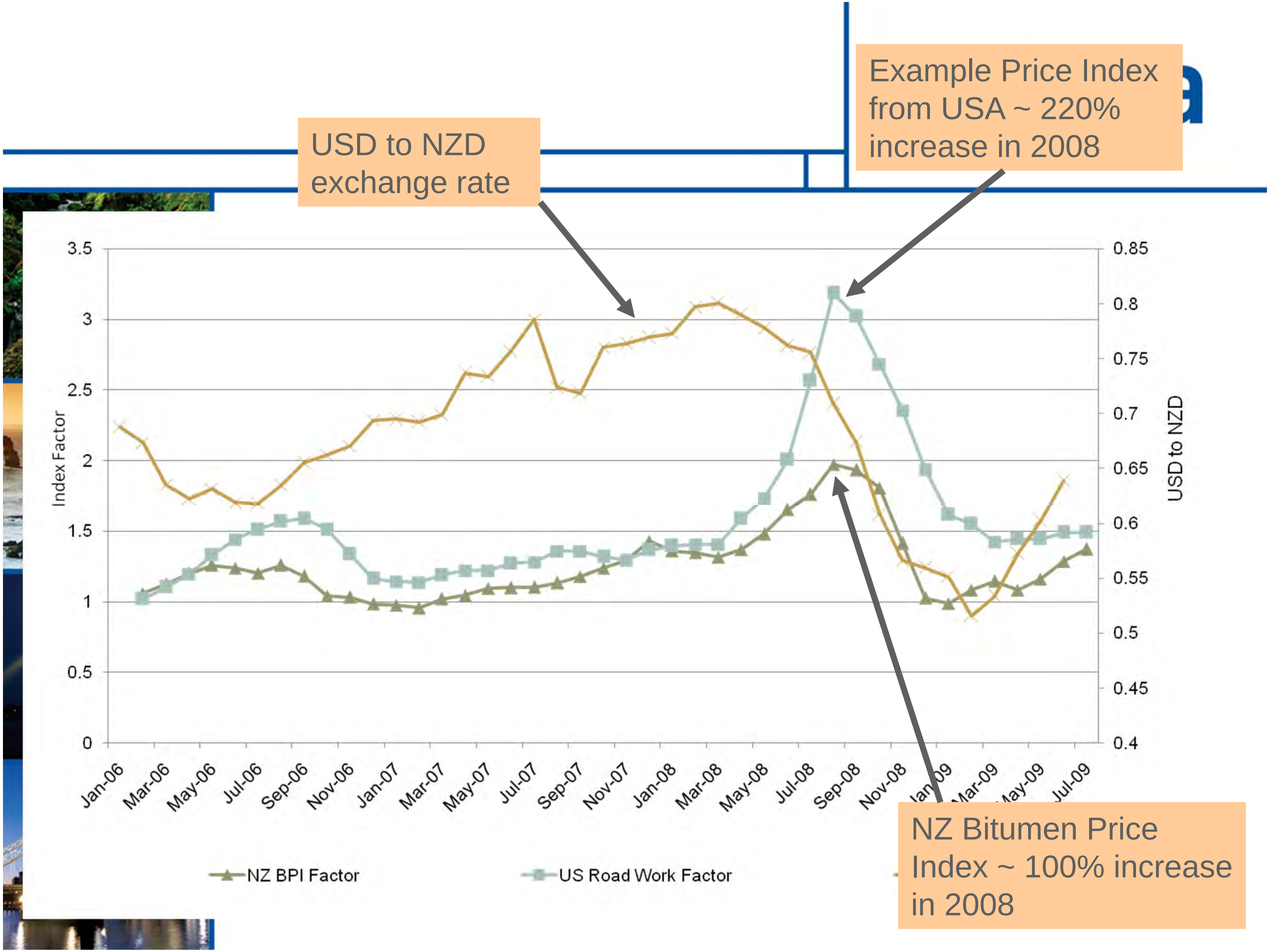


August 2008 ~ 100% increase
from January 2006



Remains 30% higher from
January 2006 today




USD to NZD exchange rate
Example Price Index from USA ~ 220% increase in 2008
NZ Bitumen Price Index ~ 100% increase in 2008
Index Factor
USD to NZD
3.5
3
2.5
2
1.5
1
0.5
0
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
0.45
0.4
Jan-06
Mar-06
May-06
Jul-06
Sep-06
Nov-06
Jan-07
Mar-07
May-07
Jul-07
Sep-07
Nov-07
Jan-08
Mar-08
May-08
Jul-08
Sep-08
Nov-08
Mar-09
Jul-09
NZ BPI Factor
US Road Work Factor

The relative changes in Bitumen and other Roadway Construction Materials only tell half the story.

•An average of 45 percent of New Zealand's reseals contractors do not have escalation clauses

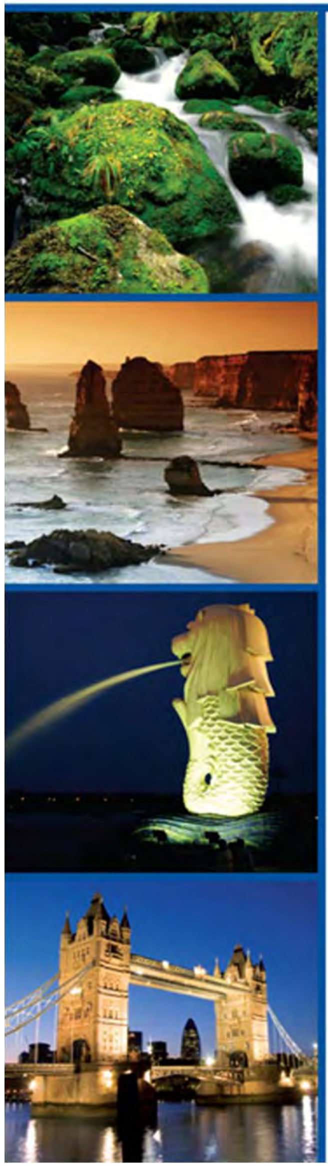
•For those that do have escalation clauses the formula used to calculate the "rise and fall" under-calculate on average by around 15 percent. This becomes very significant when large increases occur.

Source: Roading NZ, March2008

The relative changes in Bitumen and other Roadway Construction Materials only tell half the story.

While Contractors and Builders are concerned about contracts, estimating prices correctly, and compensation there are the real concerns of **Higher Prices for Infrastructure.**

Infrastructure Maintenance and New Infrastructure Installation



Numerous Examples from the US where infrastructure is being cut back due to funding concerns. The US has experienced a higher degree of cost increases.

City rejects all bids for Saratoga Avenue paving project
San Jose Mercury News. Aug 4, 2009

130 "maintenance paving" projects were canceled. They would have cost $30 million. This represents 75 percent of the planned maintenance for the next two years, a significant cut.
Kennebec Journal. Aug 5, 2009

NZ recent issues:

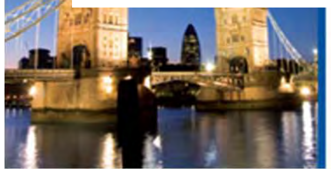
- **Western Bay of Plenty**: in 2012, to minimize rate increases, Council is proposing to **reduce seal extensions** from 10km per year to 3km per year and to reduce seal widening from 8km per year to 3km per year.

- **Dunedin City Council**: "While some allowance was made for known price movements at the pre tender stage, the reality is that the tender prices received by DCC were typically **25% higher** than anticipated. The current **Resurfacing budgets are insufficient** to allow all of our scheduled work to be completed"

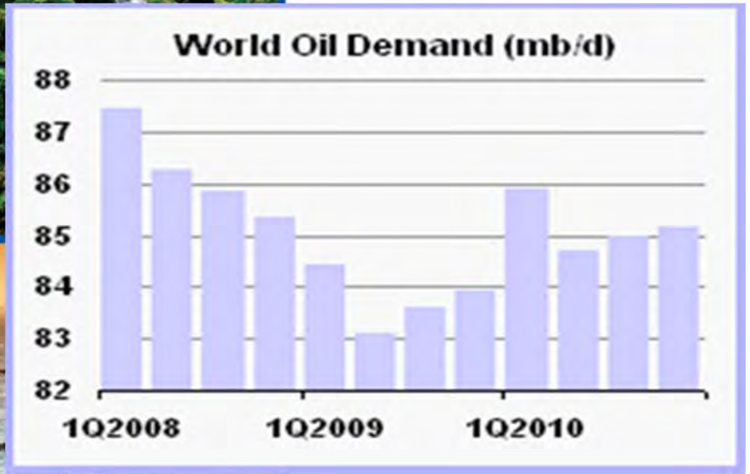
Economic Growth & Rising Demand
Steady or Decreasing Supply

Global oil demand in 2010 is expected to bounce back by +1.7% or +1.4 mb/d year-on-year to 85.2 mb/d.

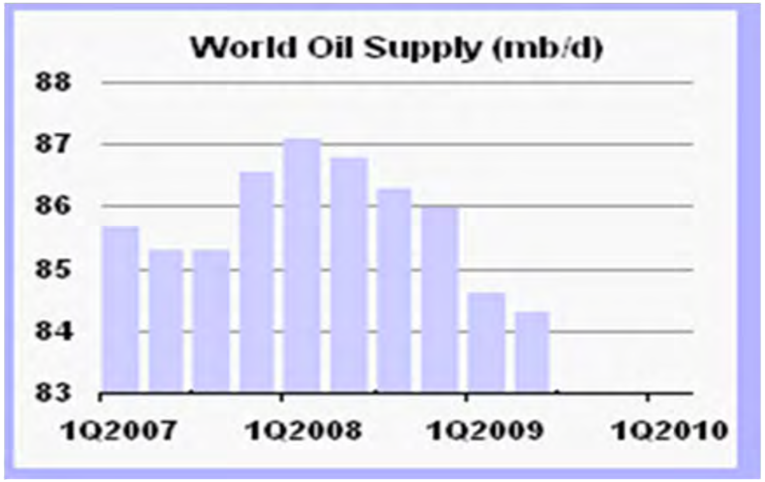
This strong rebound is led by non-OECD countries, but the OECD should also post a modest recovery. This prognosis is based on IMF economic assumptions (*World Economic Outlook*, April 2009), which see global economic growth reaching +1.8% in 2010, compared with -1.4% in 2009 (given time constraints, this report did not integrate the last IMF partial update, which was released at the time of writing).



- The weakening US dollar is a factor as oil is traded in US dollars;
- Investor flight to commodities. As property and shares become less attractive and more risky for US investors, many are turning to rising commodities as investments. Oil is a high demand commodity that holds its value;
- General geopolitical uncertainty due to unrest in the Middle East, Africa and other supply regions;
- Relentless demand pressure from China and India, fuelling the diesel-powered machinery of economic growth;
- Exchange rate pressure as the NZ dollar is trading with a high degree of volatility.



Source: *IEA*

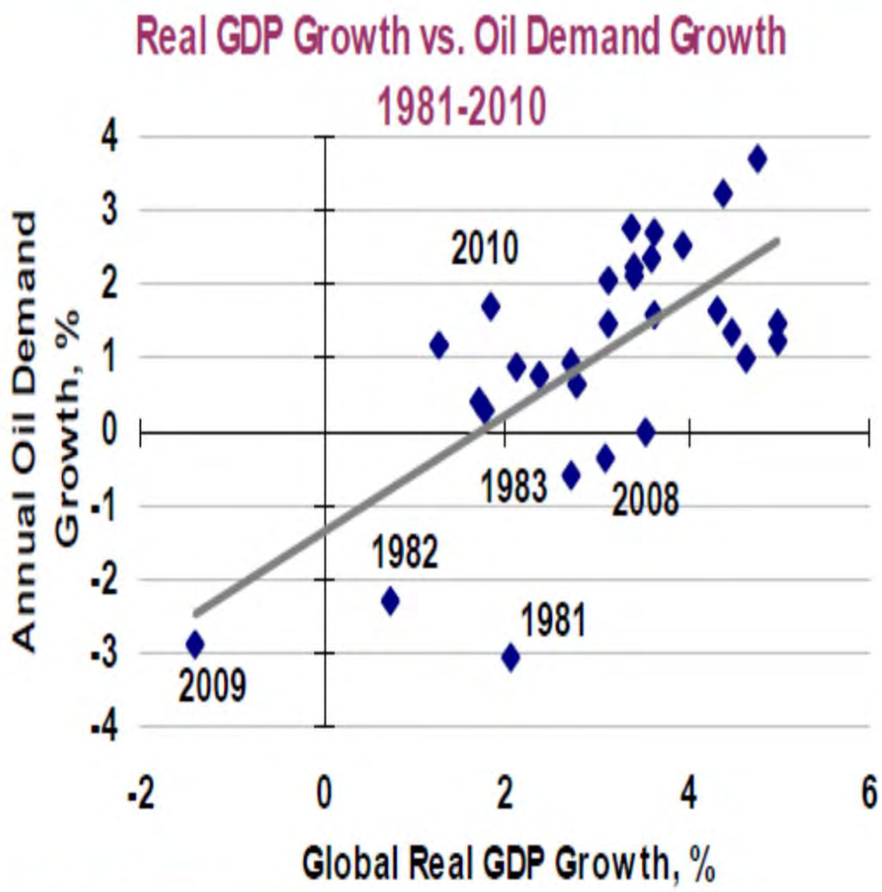


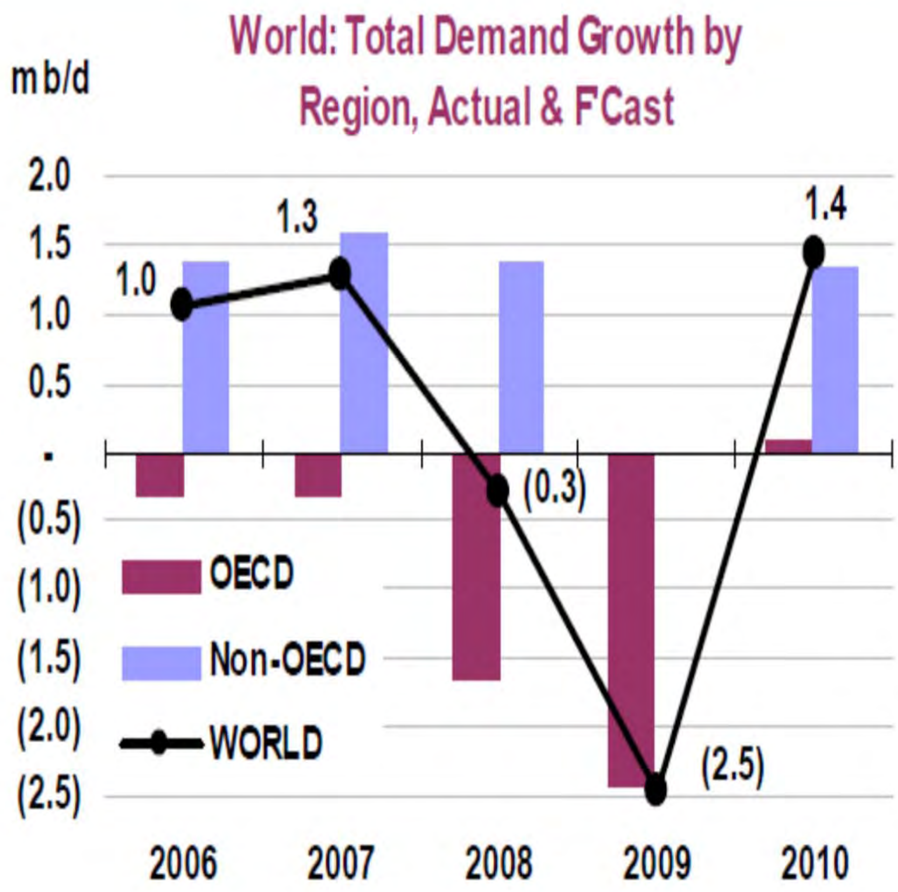
Source: *IEA*

Even if demand **remained steady**, the world would have to find the equivalent of **four Saudi Arabias** to maintain production, and six Saudi Arabias if it is to keep up with the expected increase in demand between now and 2030, Dr Birol said.

IEA estimates that the **decline in oil production** in existing fields is now running at **6.7 per cent a year** compared to the 3.7 per cent decline it had estimated in 2007, which it now acknowledges to be wrong.

Source: *The Independent interview with IEA economist Dr. Birol. 3 August 2009*

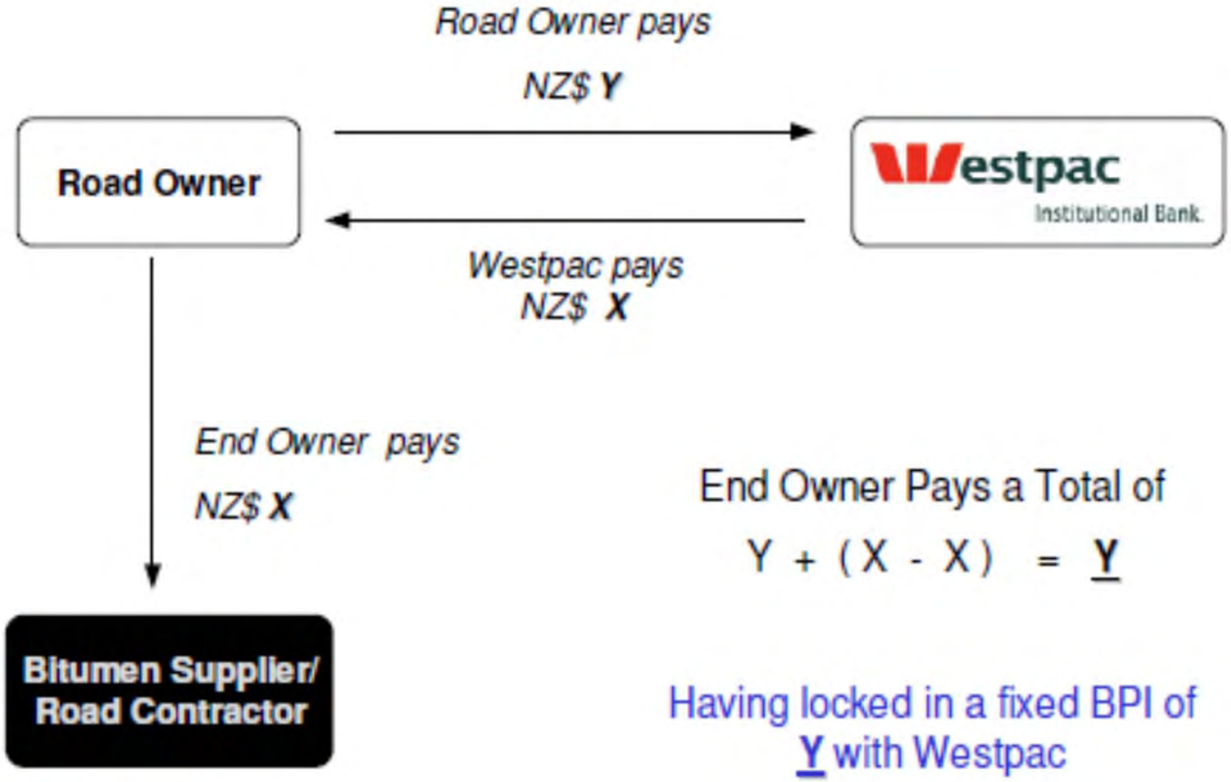




Source: *IEA. July 2009 Oil Market Report*

Hedging Cost increases in Raw Materials

Bitumen Price Index Swap



Example: Westpac Bitumen Price Index Swap

The final total price paid for a Road Resealing contract is not known until completion (after cost adjustment), making budgeting very difficult

Upon receiving a set amount of $NZ funding for the purpose, a Road Owner budgets to Reseal a certain number of kilometres of road.

However, when these "Cost Adjustment Factors" are applied to the original tender amount, the cost per KM is potentially even higher, meaning the planned resealing is only partially completed or over budget.

What does this tell us

Transport professionals will be required to assess costs of projects differently.

- changing design criteria
- change materials (Bitumen Asphalt, Concrete, etc.)
- Evaluate life-cycle options as well as economic-life returns (25year assessments)
- Acknowledge future maintenance cost variability given the relationship with world oil markets.

We should be proactively looking to reduce end project costs.

As oil prices rise, limited transport funds will be increasingly used to obtain raw materials.

Questions ??