

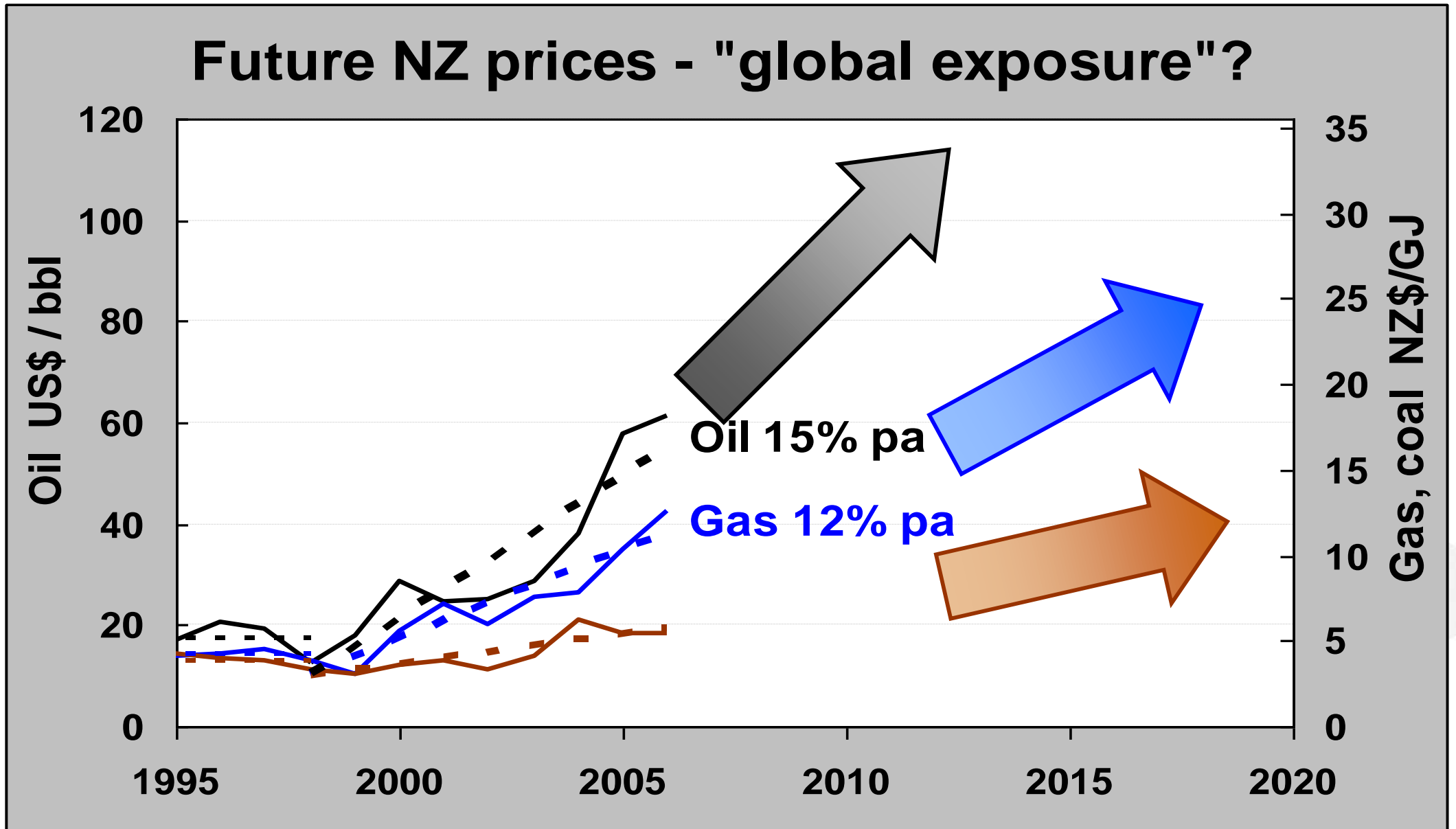
Hopkins Lecture 2006

The economy and energy: are both sustainable?

Don Elder

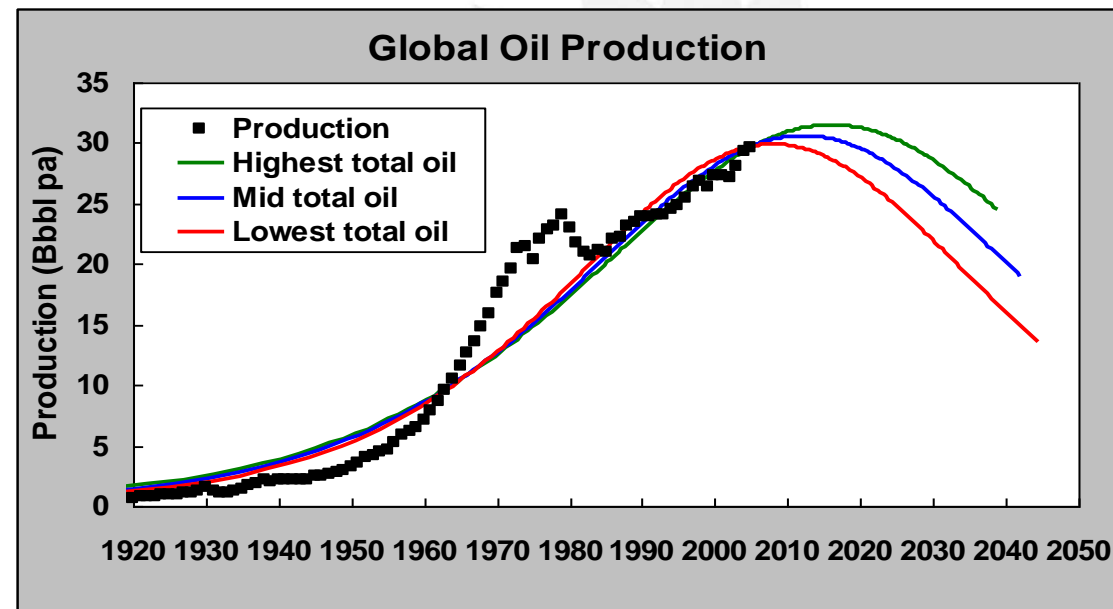
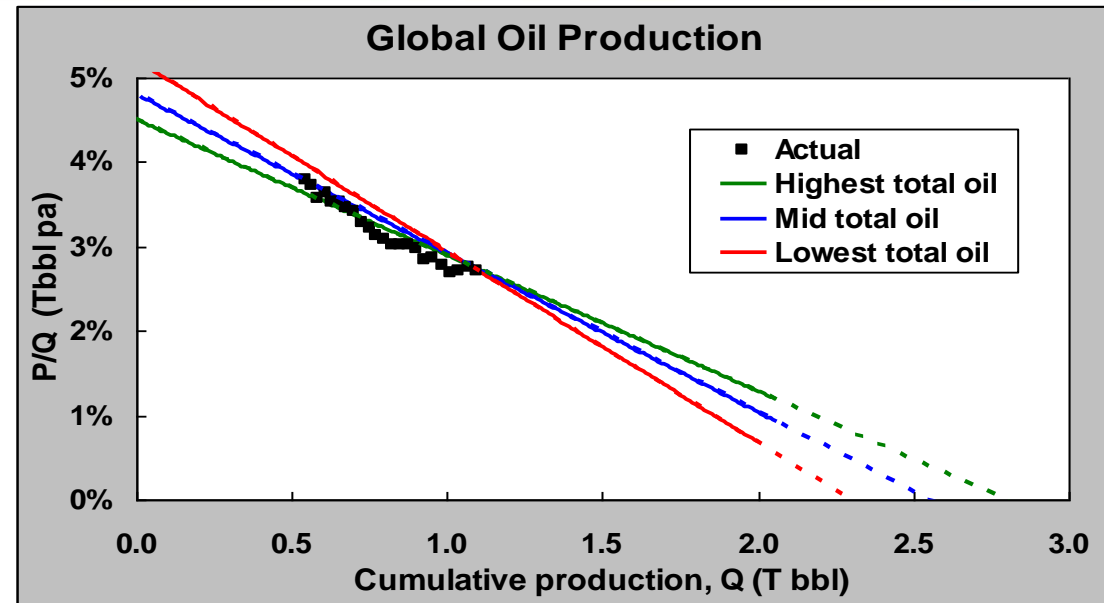


Where will oil prices go ... and how closely will gas and coal follow?

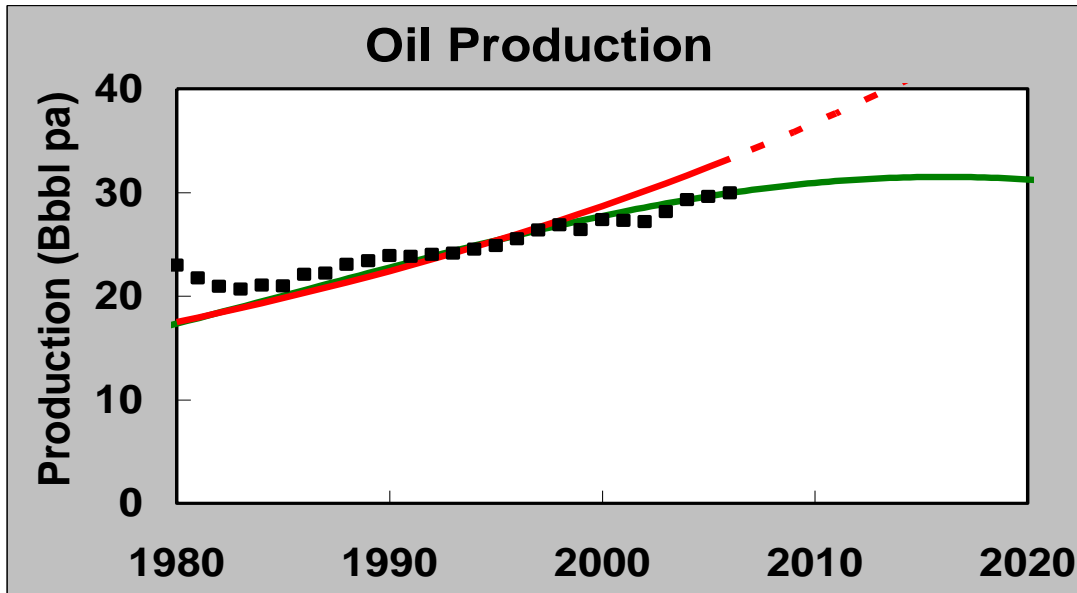


“Conventional” oil is running out ...

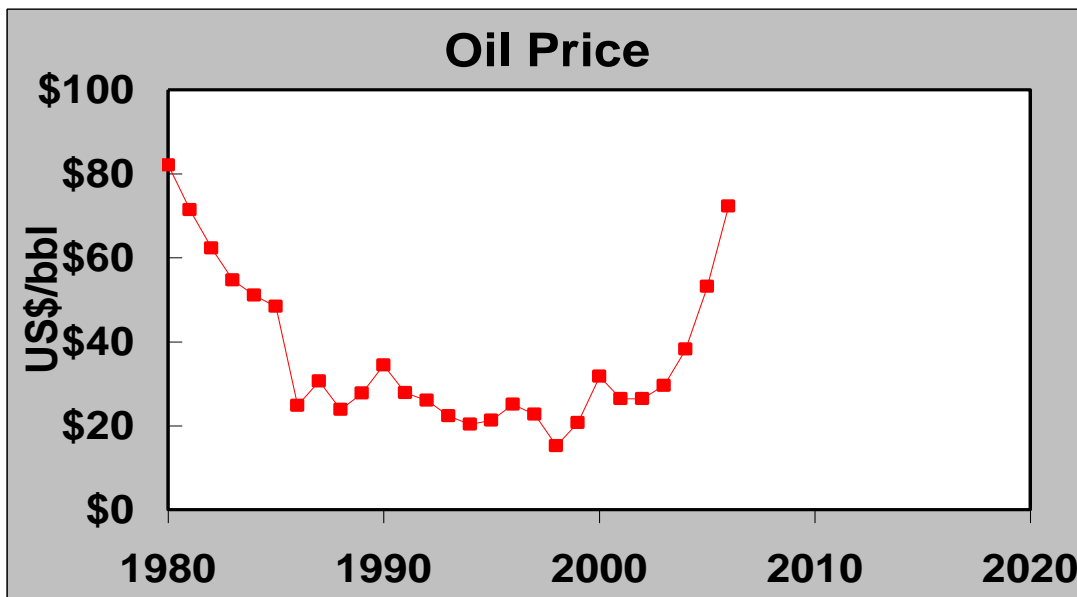
- Under any scenario peak conventional oil production is likely between 2006 and 2020 - probably sooner rather than later
- Deep oil, heavy oil and oil shale will be produced but not at the rates or prices required to maintain the global oil economy



Oil prices are driven – like all markets - by the point of intersection of demand and supply



- From 1980 to 1993 production capacity exceeded underlying demand ... and the price fell
- Since 1998 the rate of underlying demand growth has exceeded the rate of production growth ... and prices have risen, increasingly steeply

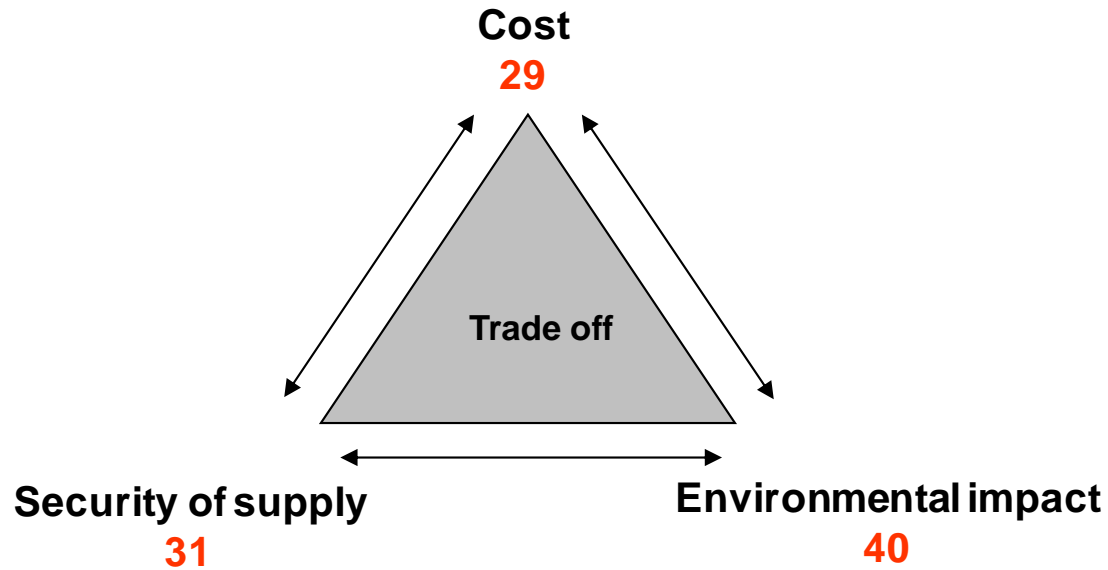


NZers continue to be worried about our energy / electricity situation .. although many are confused

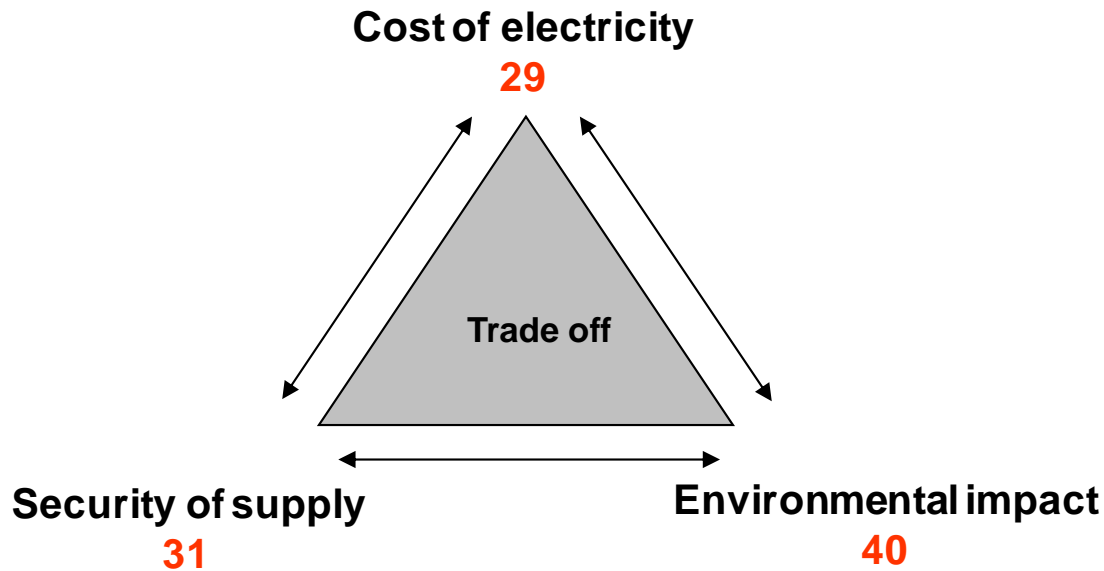
- **65% believe we do not have an appropriate energy or electricity plan/strategy**
- **85% think we will have electricity shortages in the next 5-10 years**
- **However 81% also think electricity provides most or all of NZ's energy needs**



NZers say they rate electricity cost and security evenly, and reduced environmental impact highly



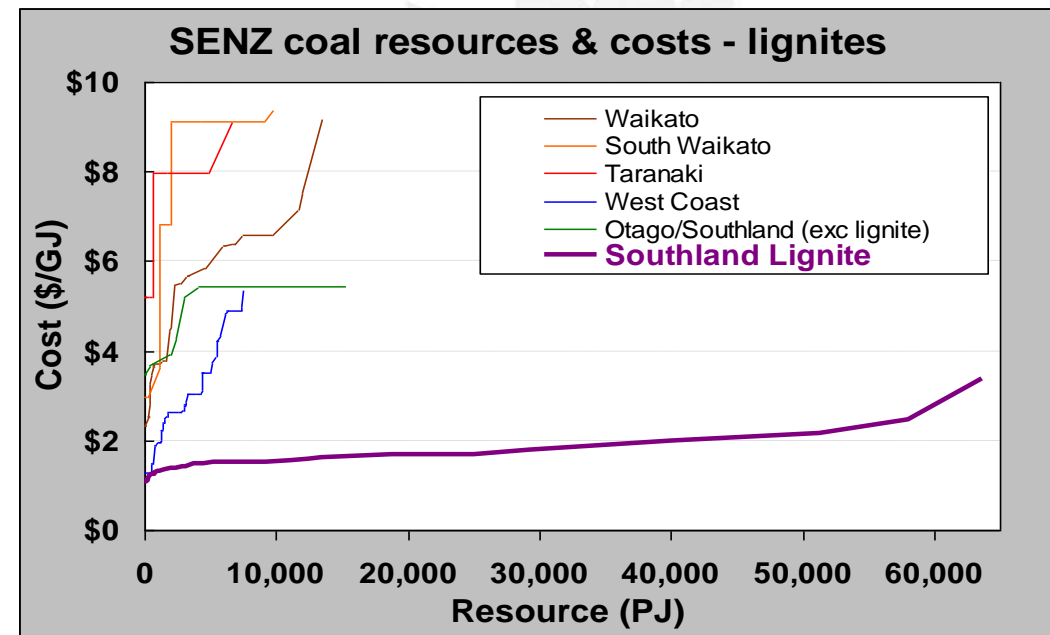
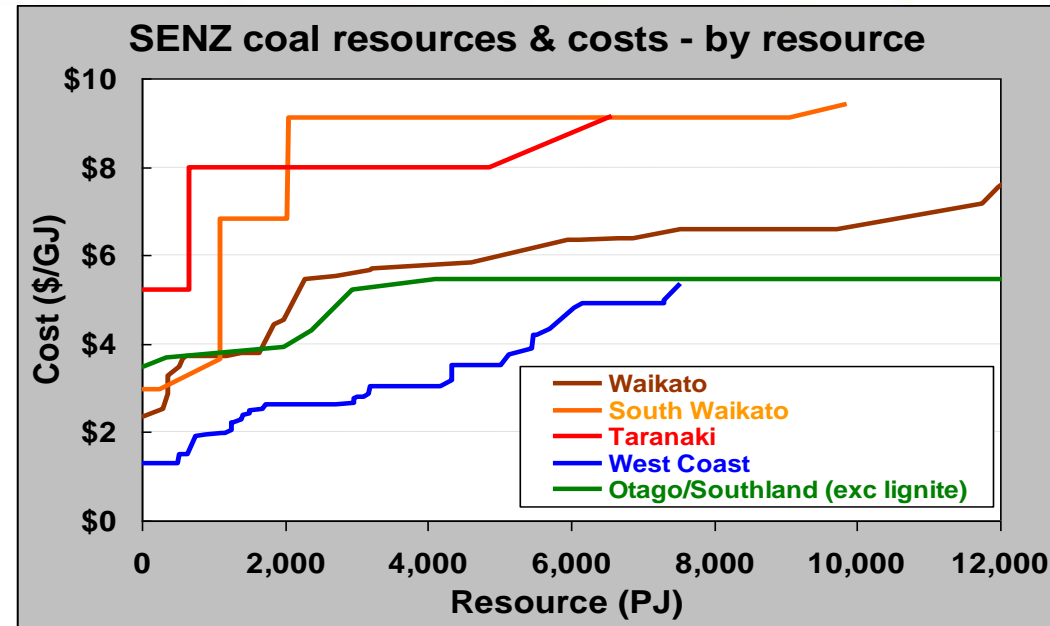
NZers say they rate electricity cost and security evenly, and reduced environmental impact highly



- But only
- 20% would pay \geq \$10/week (8%) for increased security
- 26% would pay \geq \$10/week to reduce environmental impacts
- And 59% would not support a carbon tax being passed on to consumers by generators

Can coal be a NZ option?

- NZ has the largest per capita thermal coal resource of any country (similar to Australia):
- >6,000 PJ in each of 5 regions
- 50-100,000 PJ lignites <\$3/GJ
- 150-200,000 PJ <\$5/GJ(??)

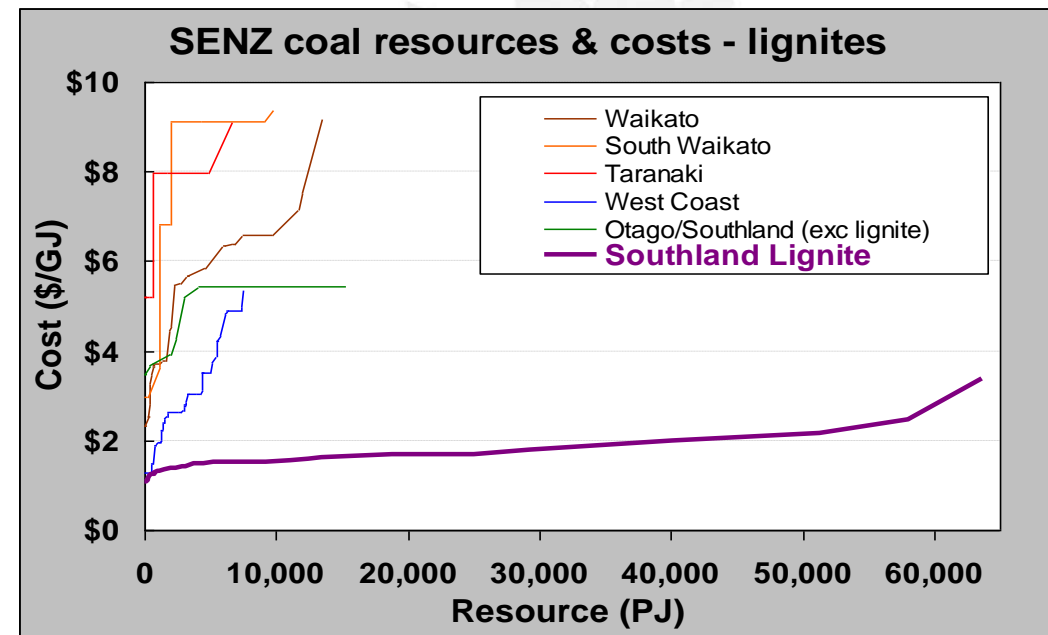
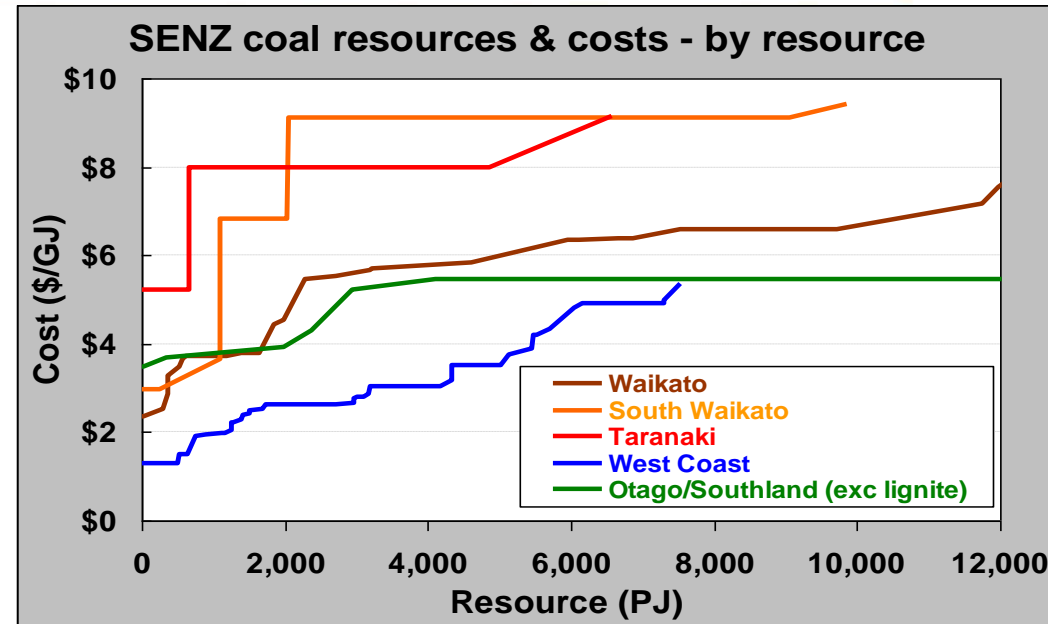


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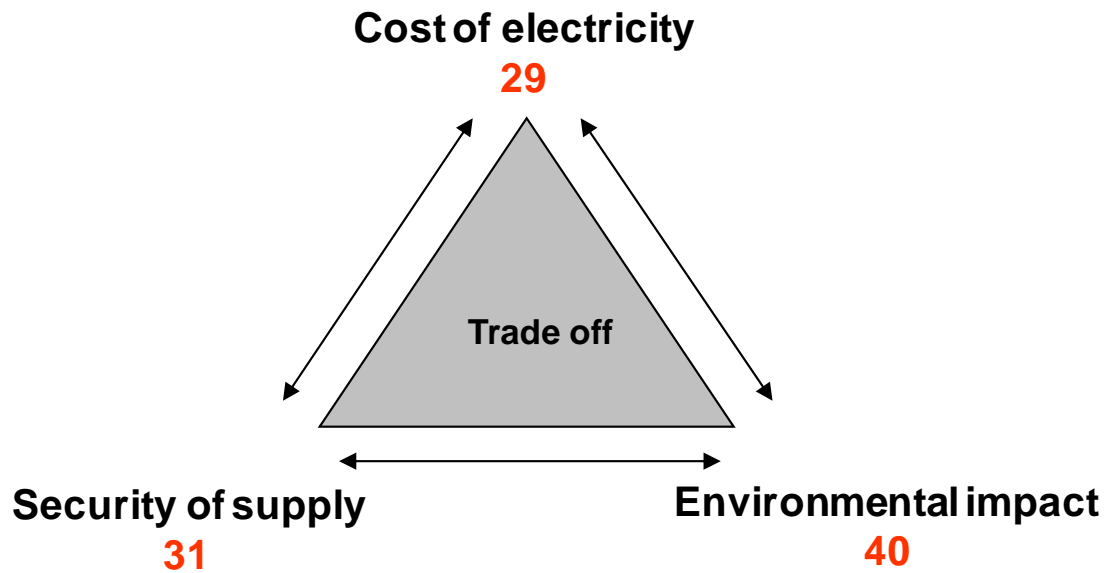
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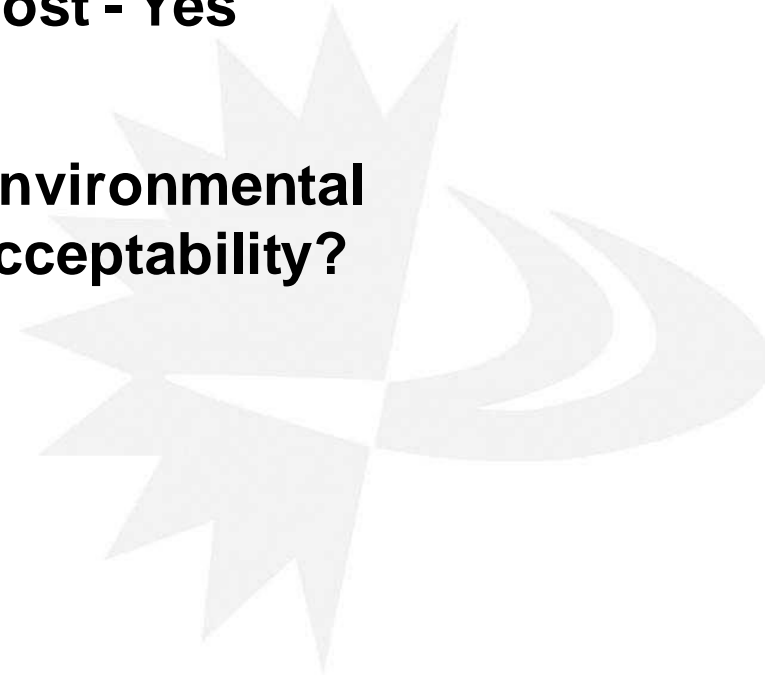
- 2,000-2,500 yrs at today's rates
- 600-700 years at 250 PJpa
- 250-300 years at 600 PJpa
- resource value \approx \$1,000 billion?



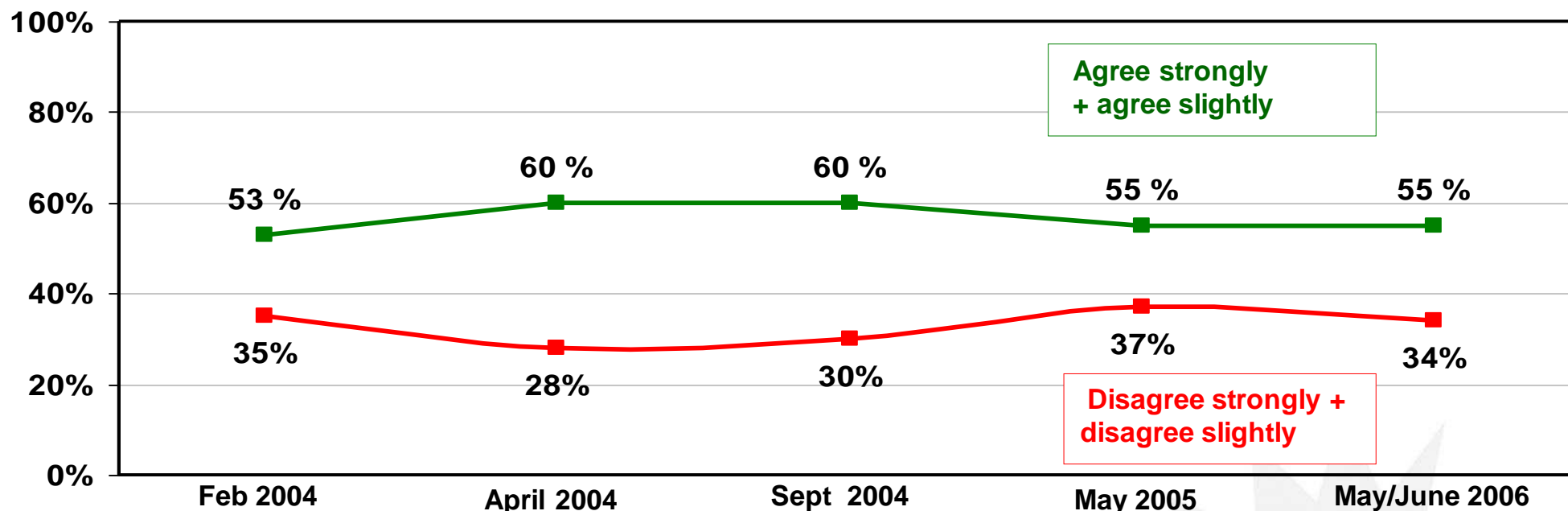
Can coal address all three energy objectives?



- **Security - Yes**
- **Cost - Yes**
- **Environmental acceptability?**



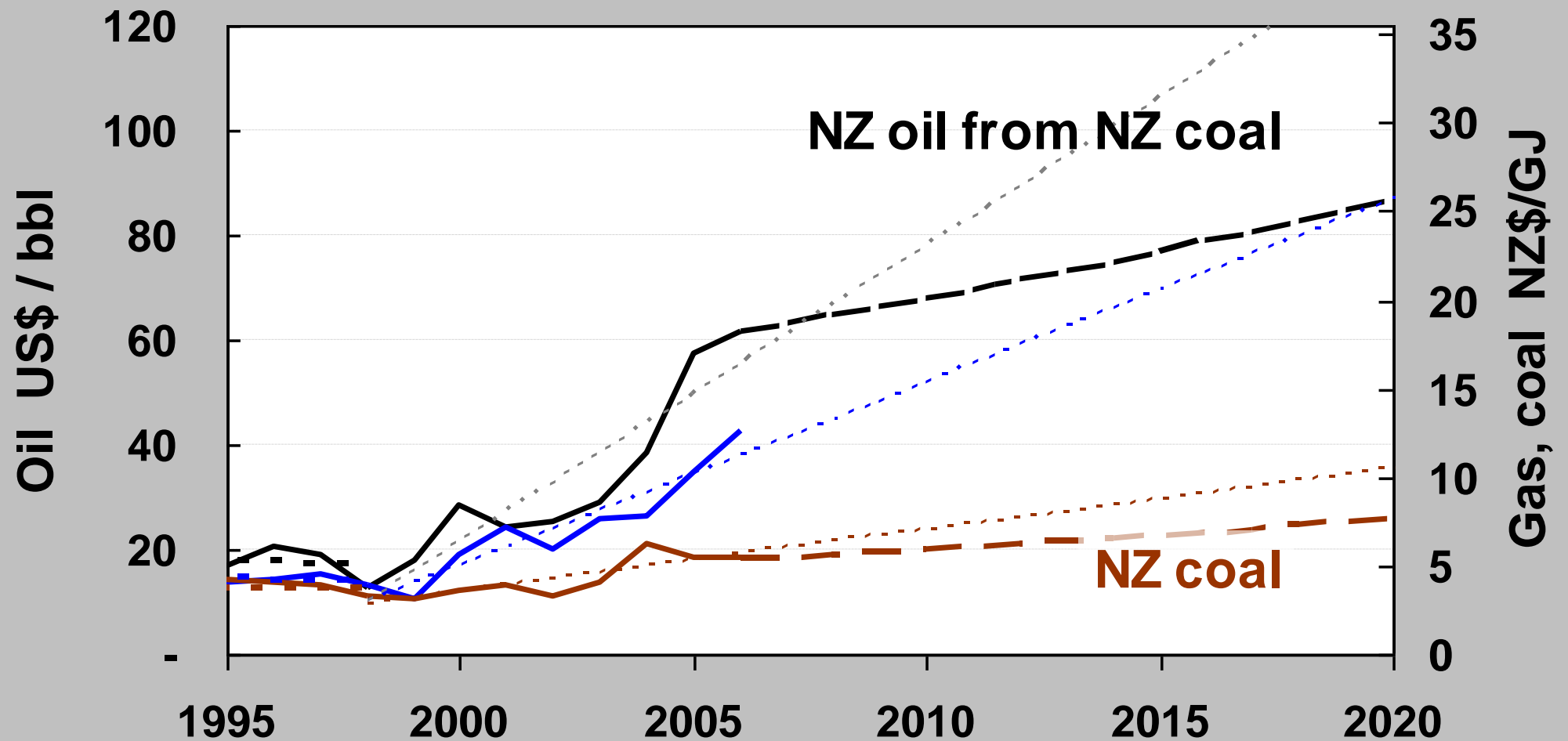
55% of NZers currently think we should be making greater use of our coal resources



- 86 would have a more positive opinion if they knew technology was being used to reduce pollutant gases from power stations
- 72% would have a more positive opinion if they knew CO₂ capture and storage technology could be used within 10-20 years
- 36% would have a more positive opinion if coal could reduce the cost of electricity

Our coal resources can offer energy security for all fuels – and economic security for centuries

Future NZ prices - "indigenous security"



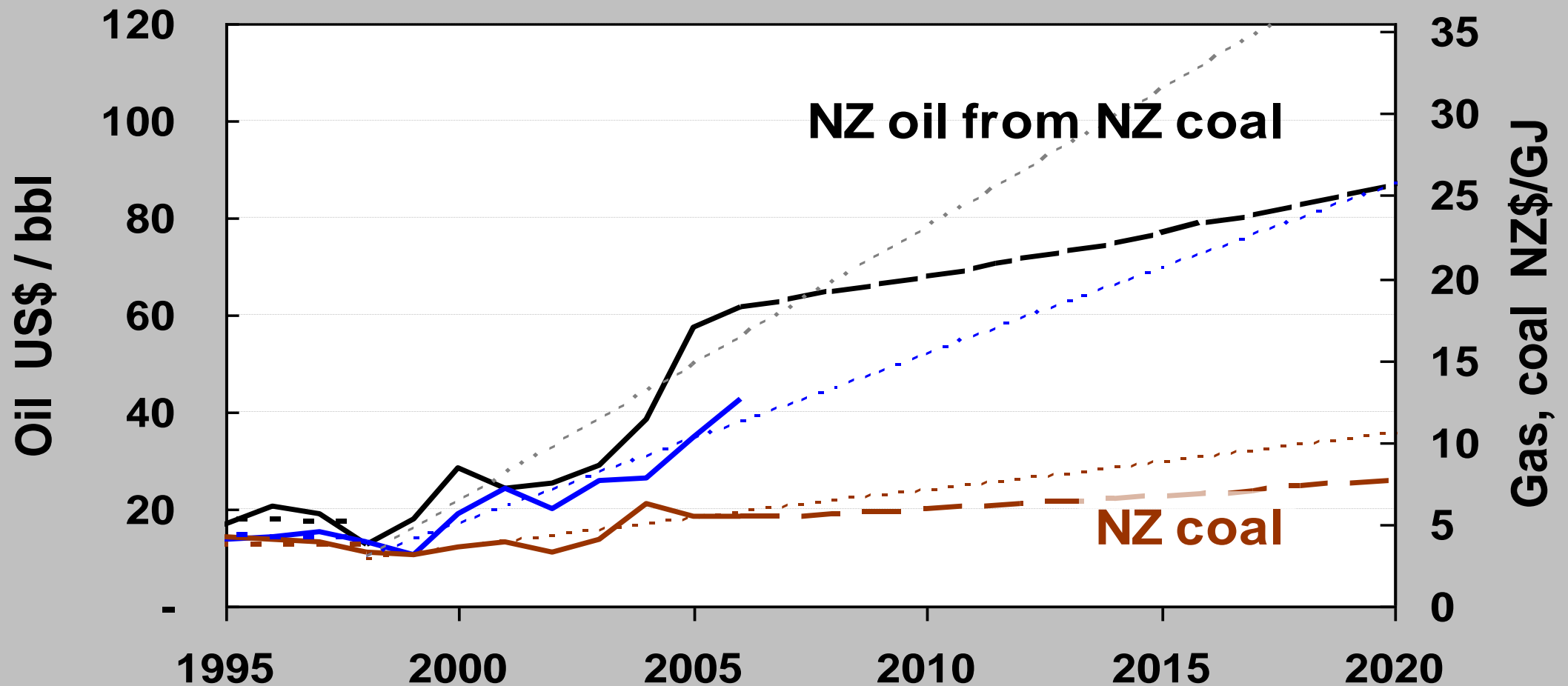
Technology based approach to climate change

- **Price based measures in the short term:**
 - **will not** incentivise investment in technology R&D
 - **will** reduce economic growth
- **R & D is critical**
 - NZ is too small to ‘afford’ R & D of technologies at the scale required
 - NZ could lead the way in agricultural methane emissions
 - No mainstream country has significant investment earmarked for agricultural methane R & D
- **Technology transfer will be critical for NZ**



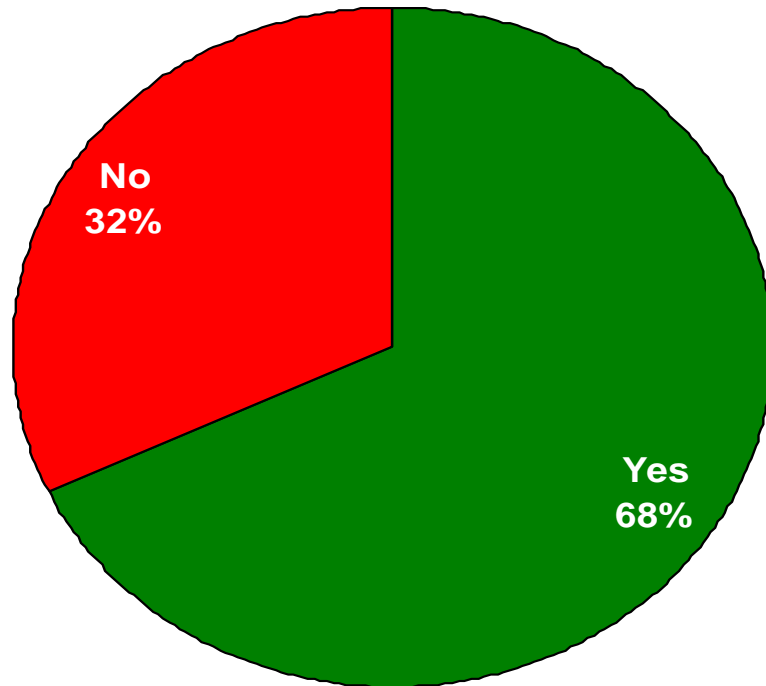
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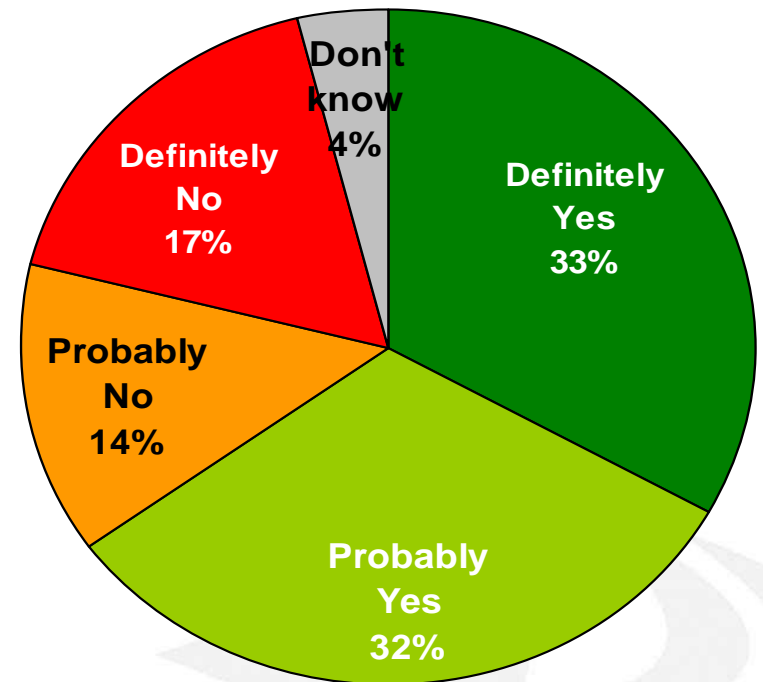


Over 2/3 of NZers knew about the “snails” and well over 80% were supportive

Had heard/read anything about granting a Wildlife Permit to move snails



Think outcome is reasonable



- Of those who did not think the outcome was reasonable, over half thought it was a waste of time/money etc