

Electricity, growth, and the future

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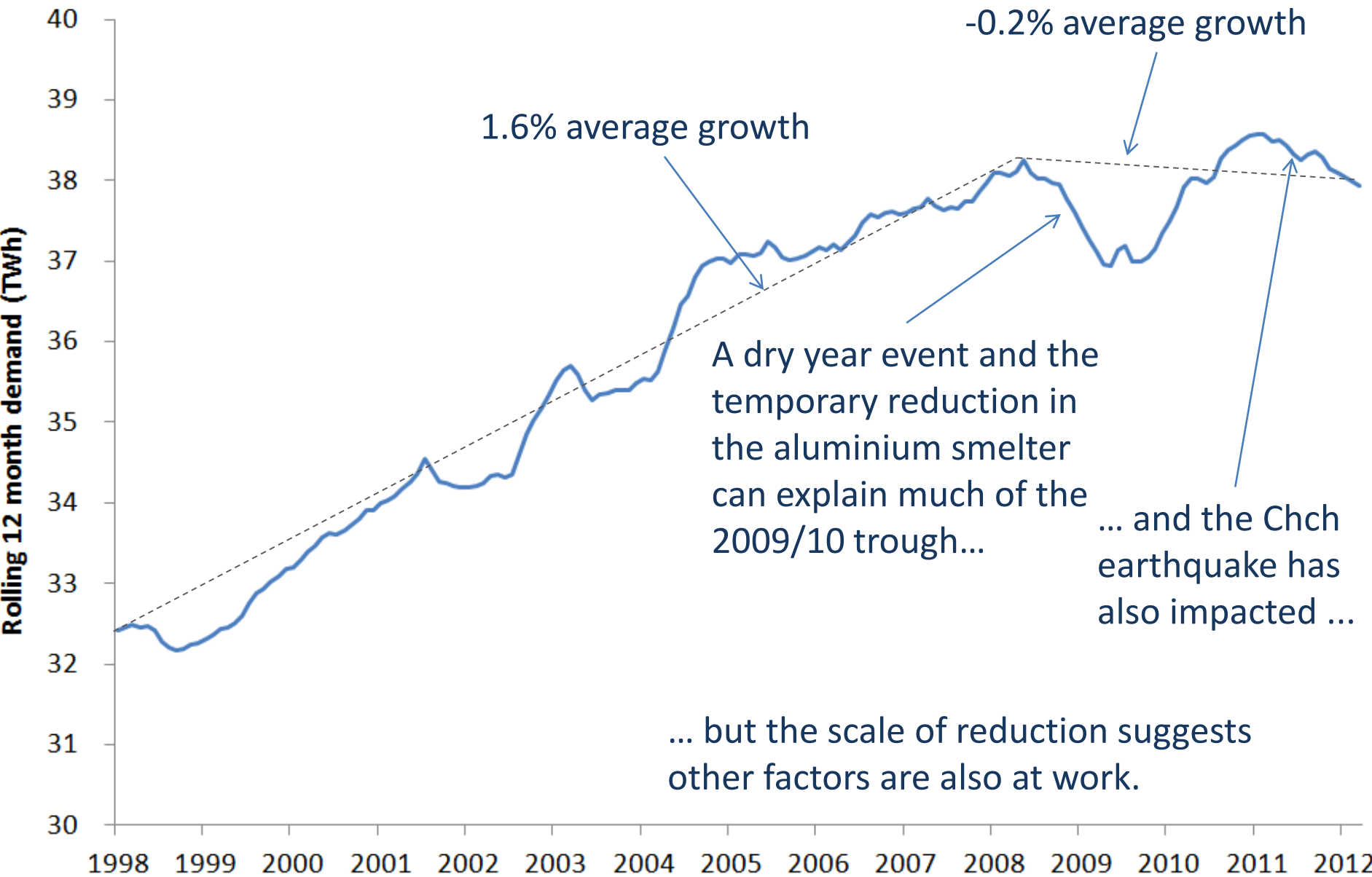
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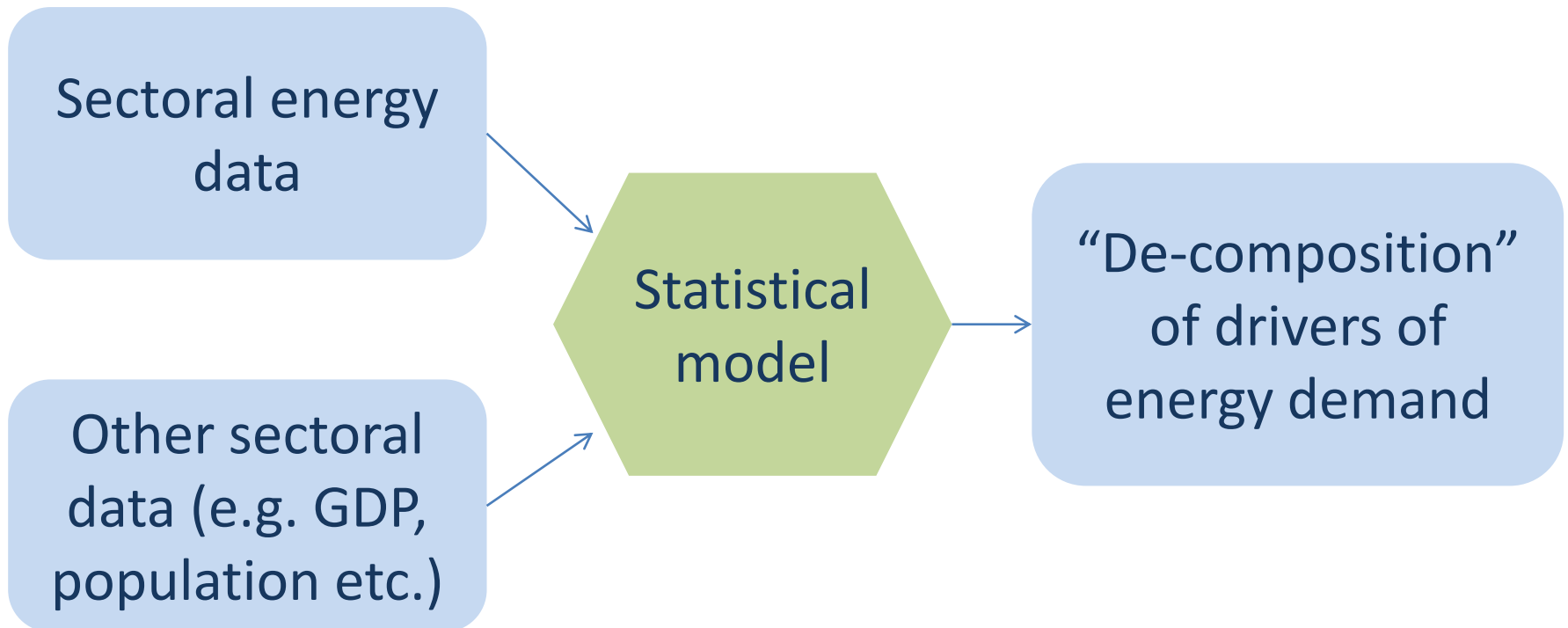
Contents

- What has been happening to New Zealand demand, and why?
- What has been happening overseas?
- What might this mean for future NZ demand?

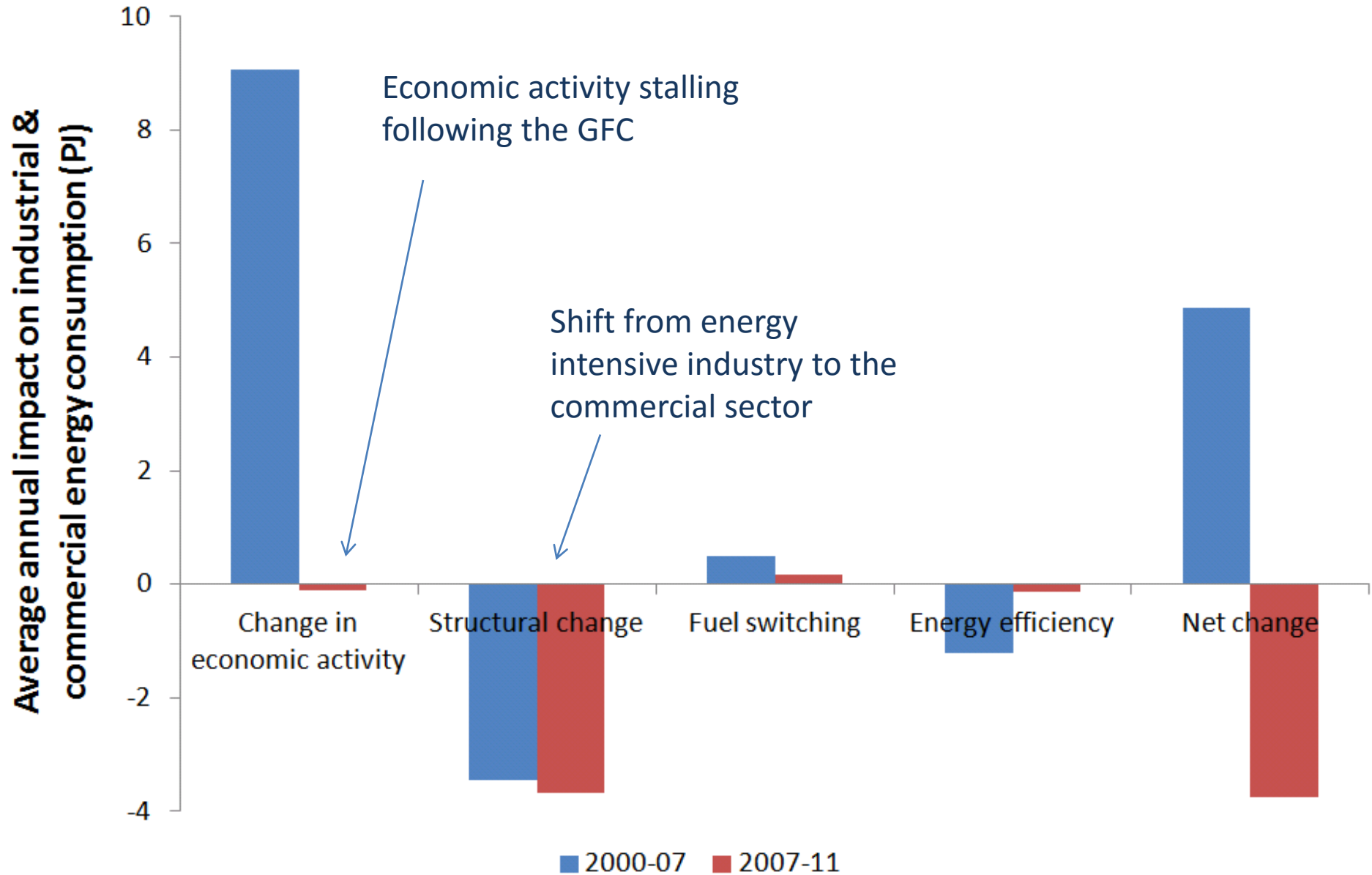
Electricity demand growth appears to have stalled



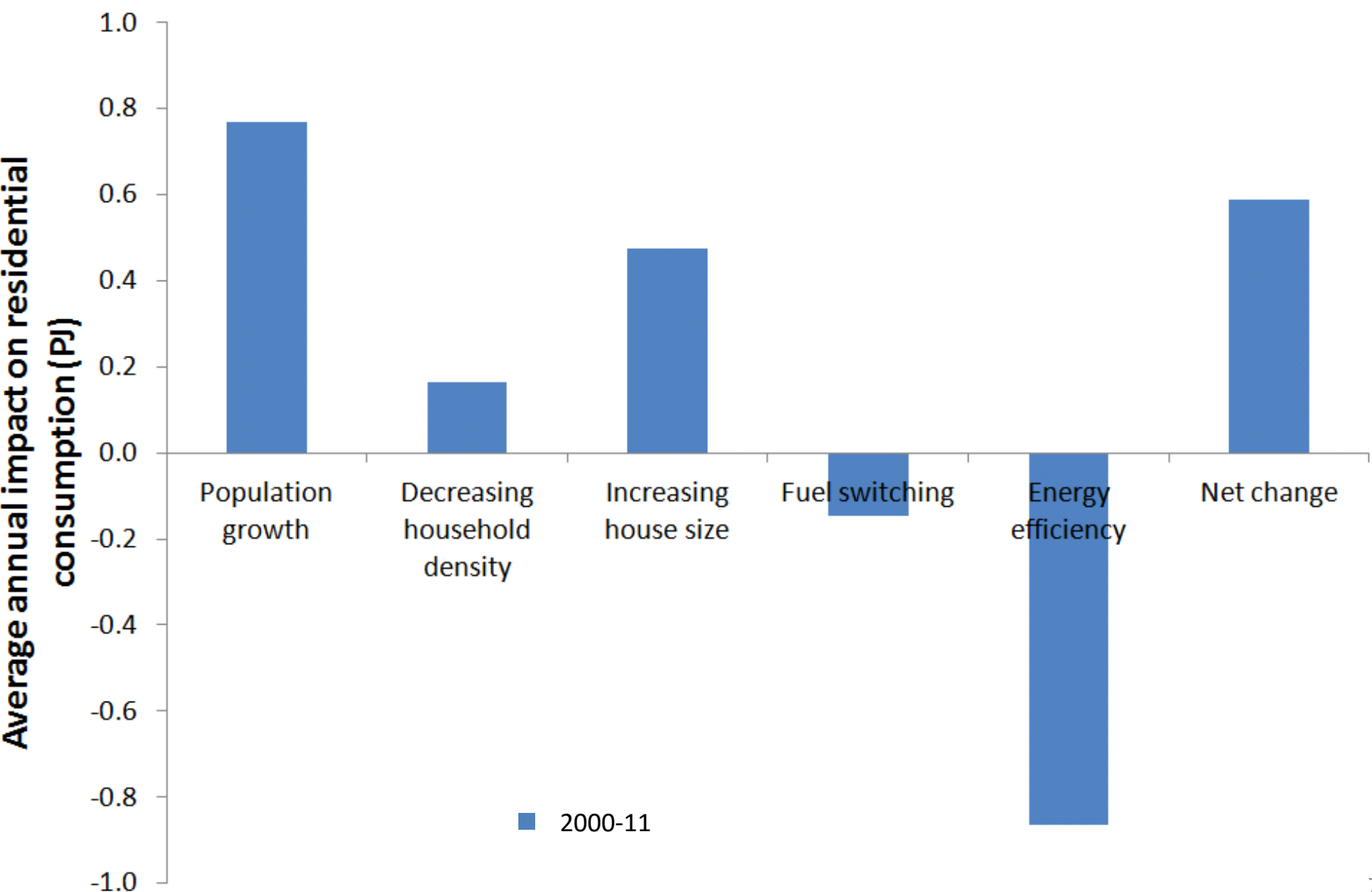
Recent MBIE analysis provides a useful framework



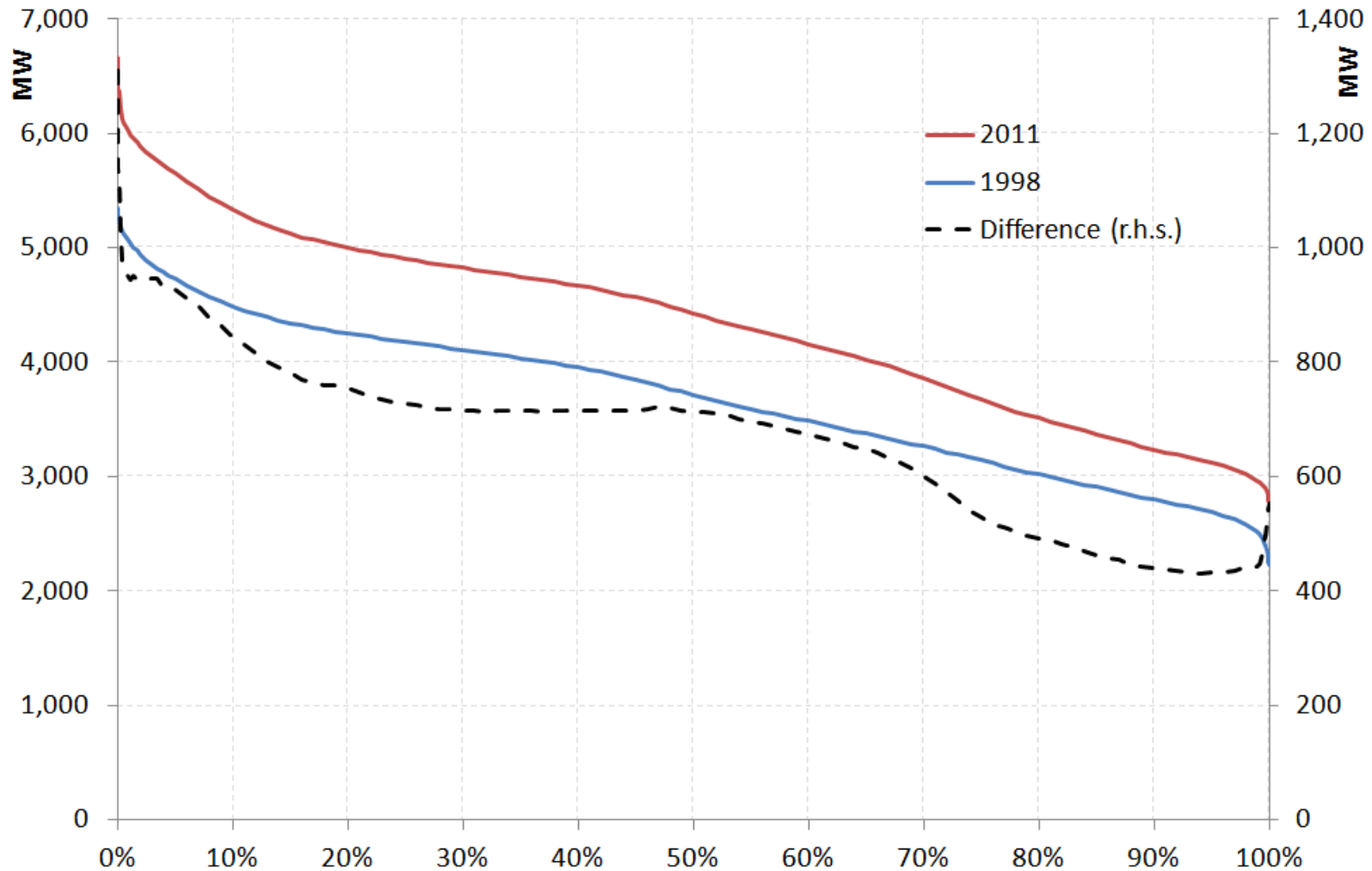
The global financial crisis, and a shift away from energy intensive industry are driving I&C demand outcomes



Residential energy efficiency initiatives are counteracting population growth and housing changes



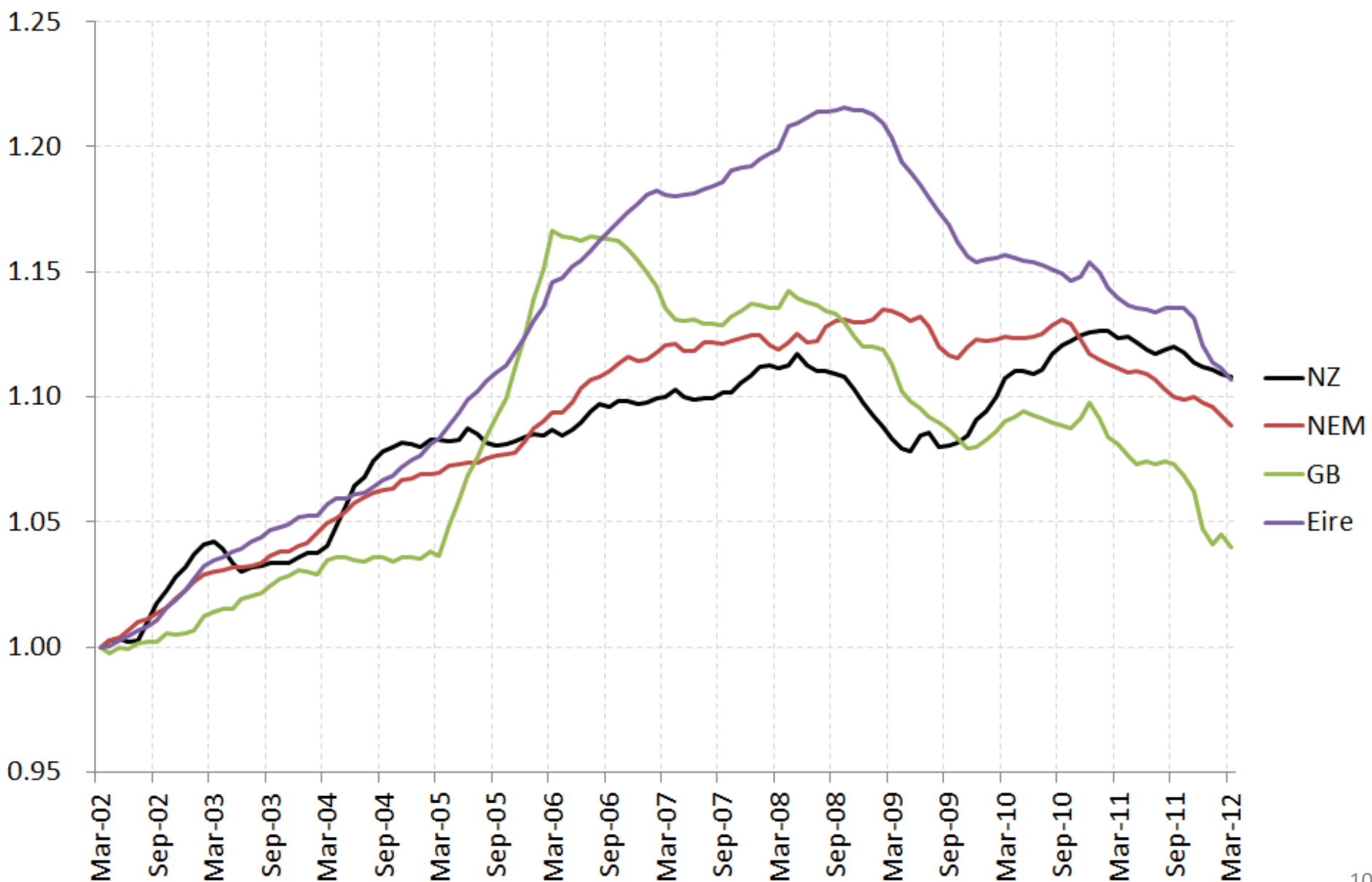
The relative growth in commercial demand (plus the growth of heat pumps?) is also making demand peakier



- Approx. 30% of demand growth has been mid-merit / peaking
- Unless existing hydro can increasingly ‘sculpt’ water to meet such growth, this lower capacity factor demand is unlikely to be met by renewables

What has been happening overseas?

Other countries are also experiencing reducing demand

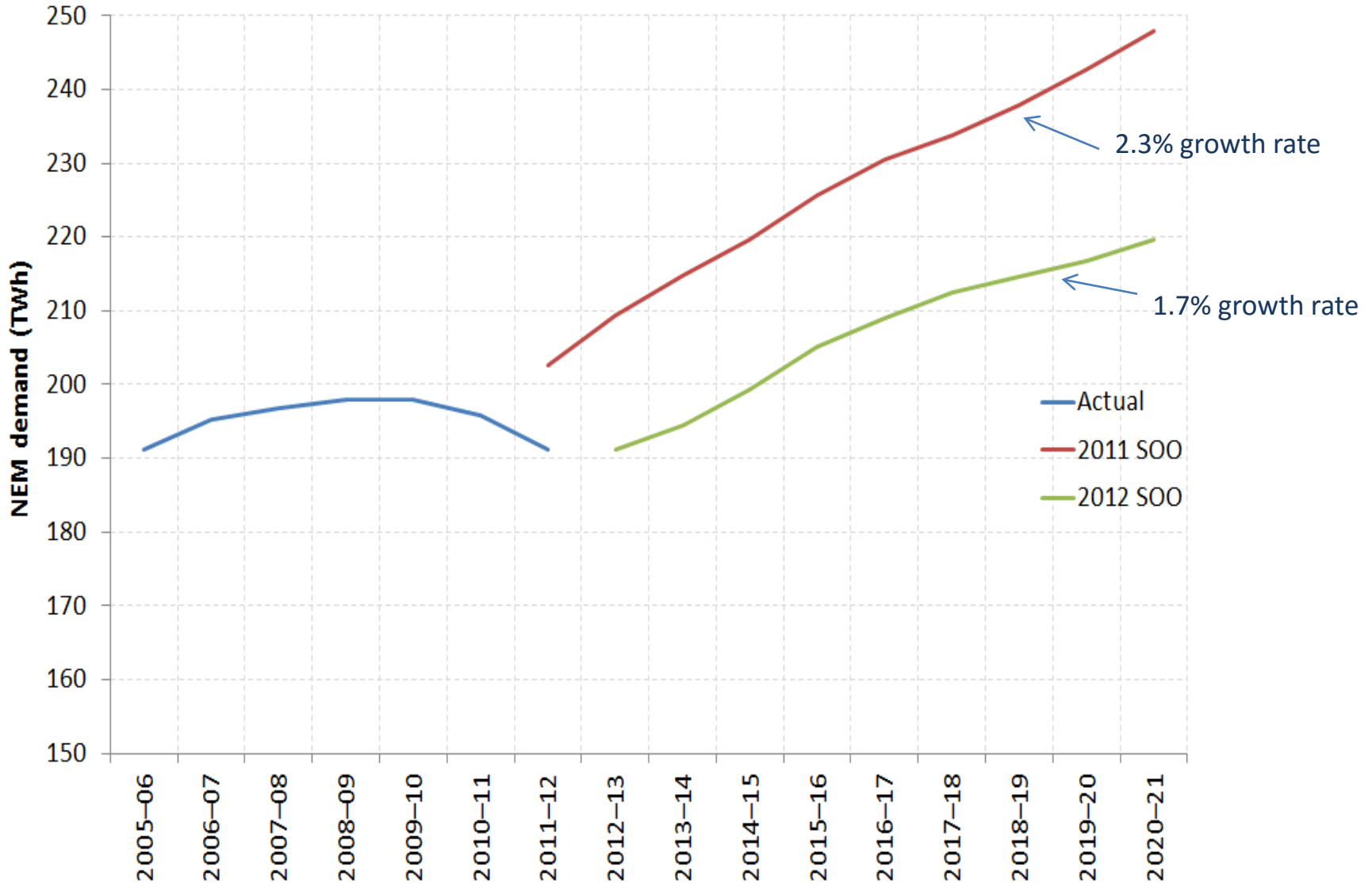


AEMO identified four factors impacting Australian demand

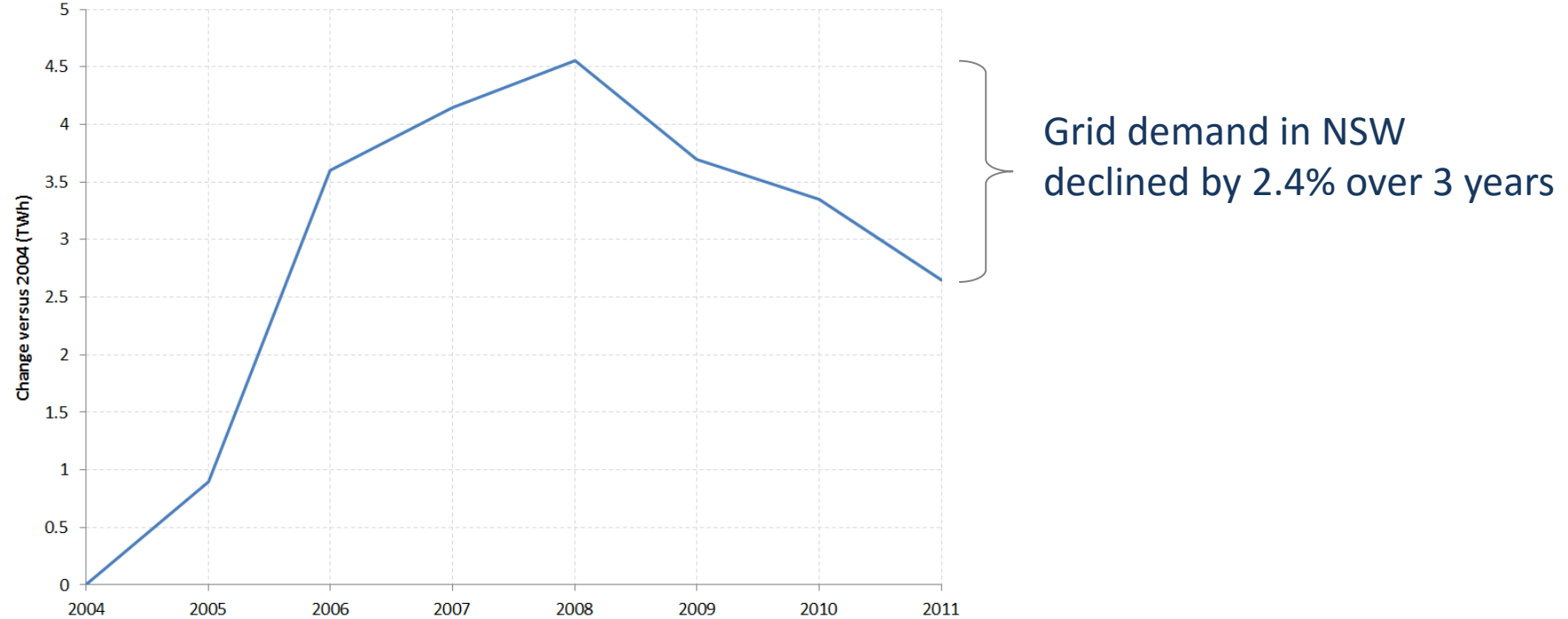
- Reduction in international demand for minerals & hydrocarbons
- Reduced Australian manufacturing due to high A\$ and GFC
- Penetration of embedded gen
- Energy efficiency + consumer response to rising electricity costs
 - Forecast 8% demand reduction by 2030 due to efficiency policies

This is reflected in latest demand forecasts

AEMO demand forecasts for NEM



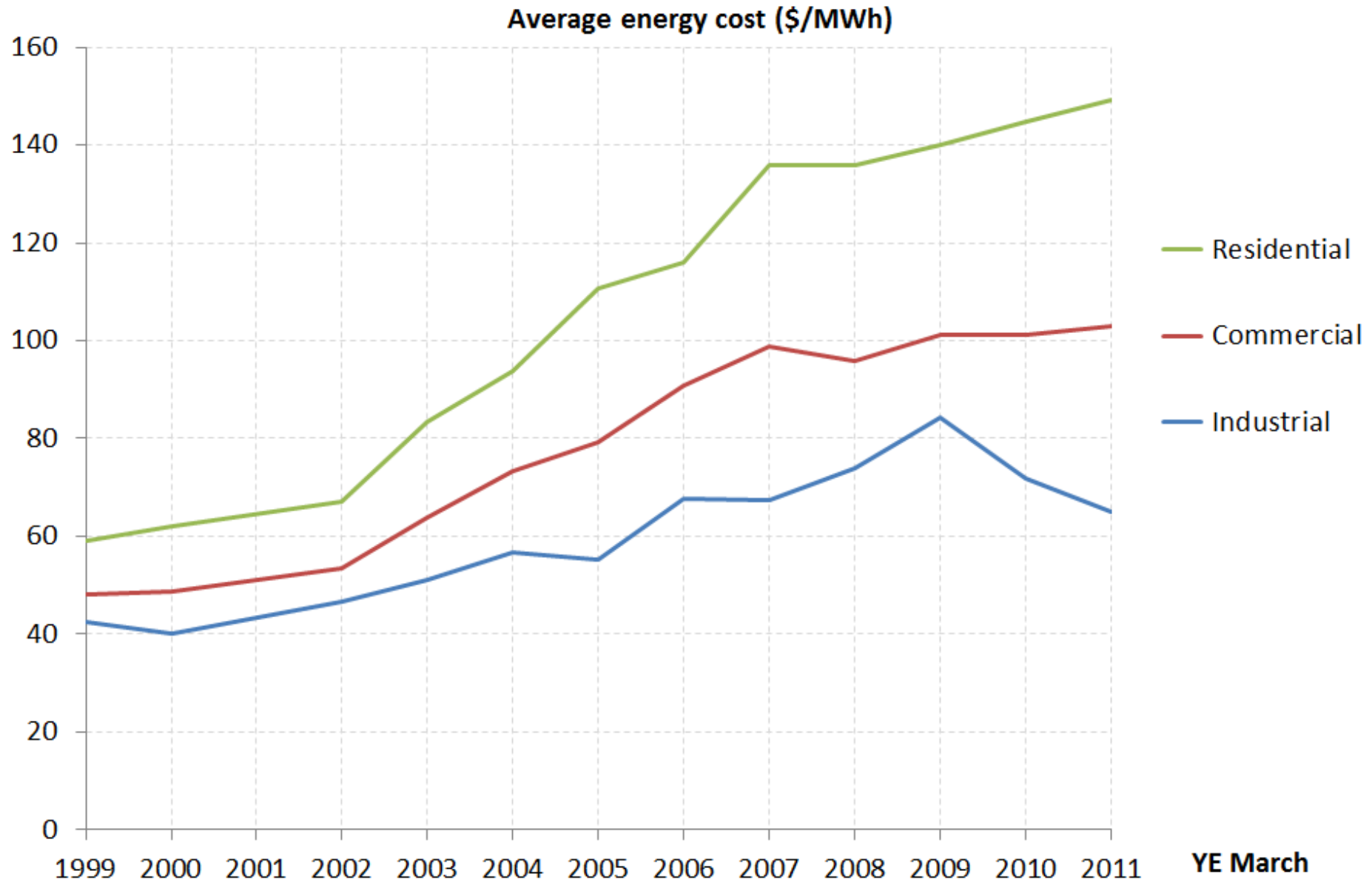
Small-scale energy generation technologies are causing a sea-change in Australian grid demand



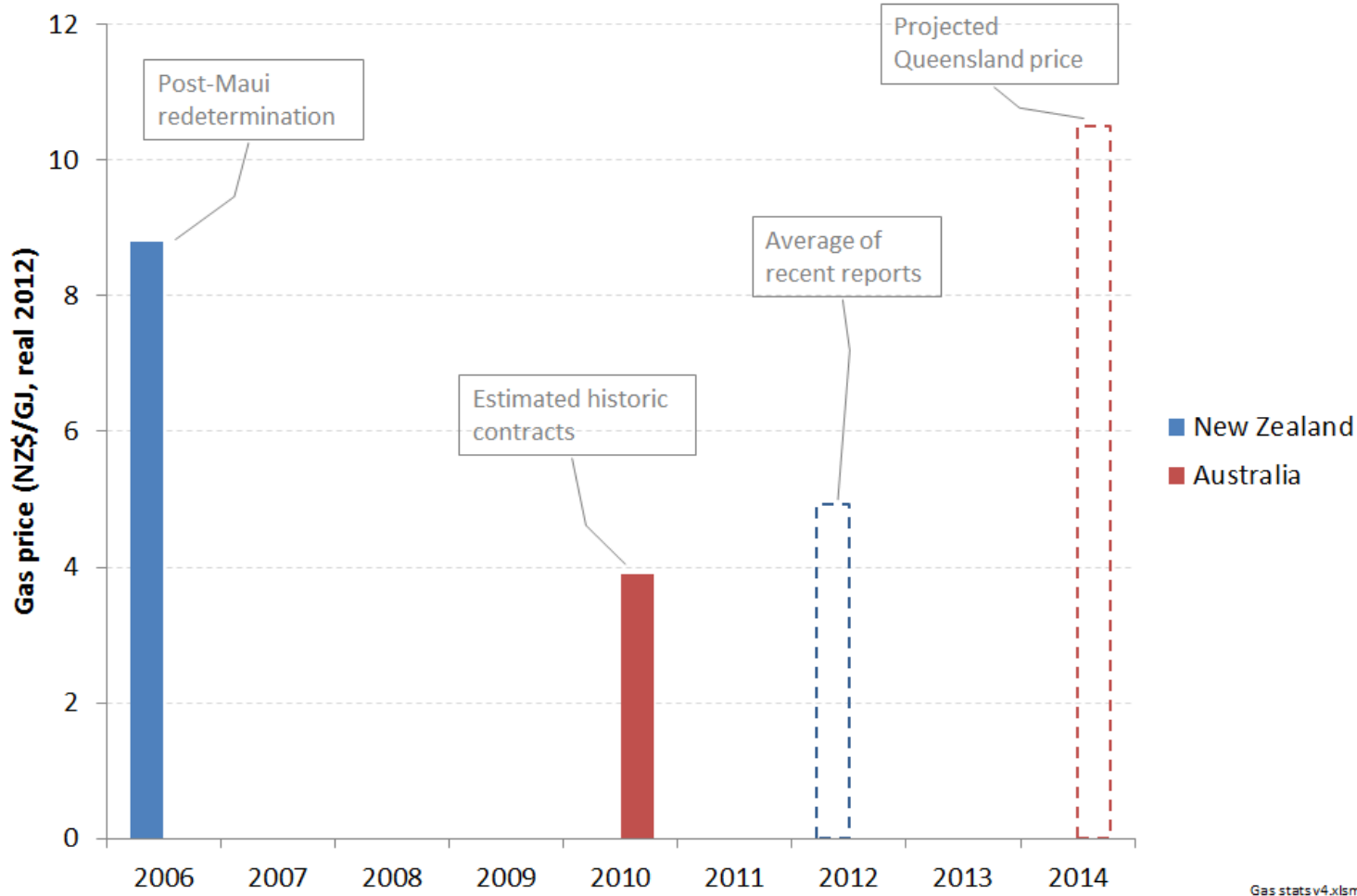
- One recent analysis estimated
 - 50% of decline due to solar PV + solar hot water
 - 25% due to other embedded generation
 - 25% due to ‘genuine’ demand reduction
- Differences in climate mean such outcomes are much less likely in NZ, unless / until prices for solar technologies fall considerably

**What might this all mean for future
NZ demand?**

Supply margin is starting to work its way into prices

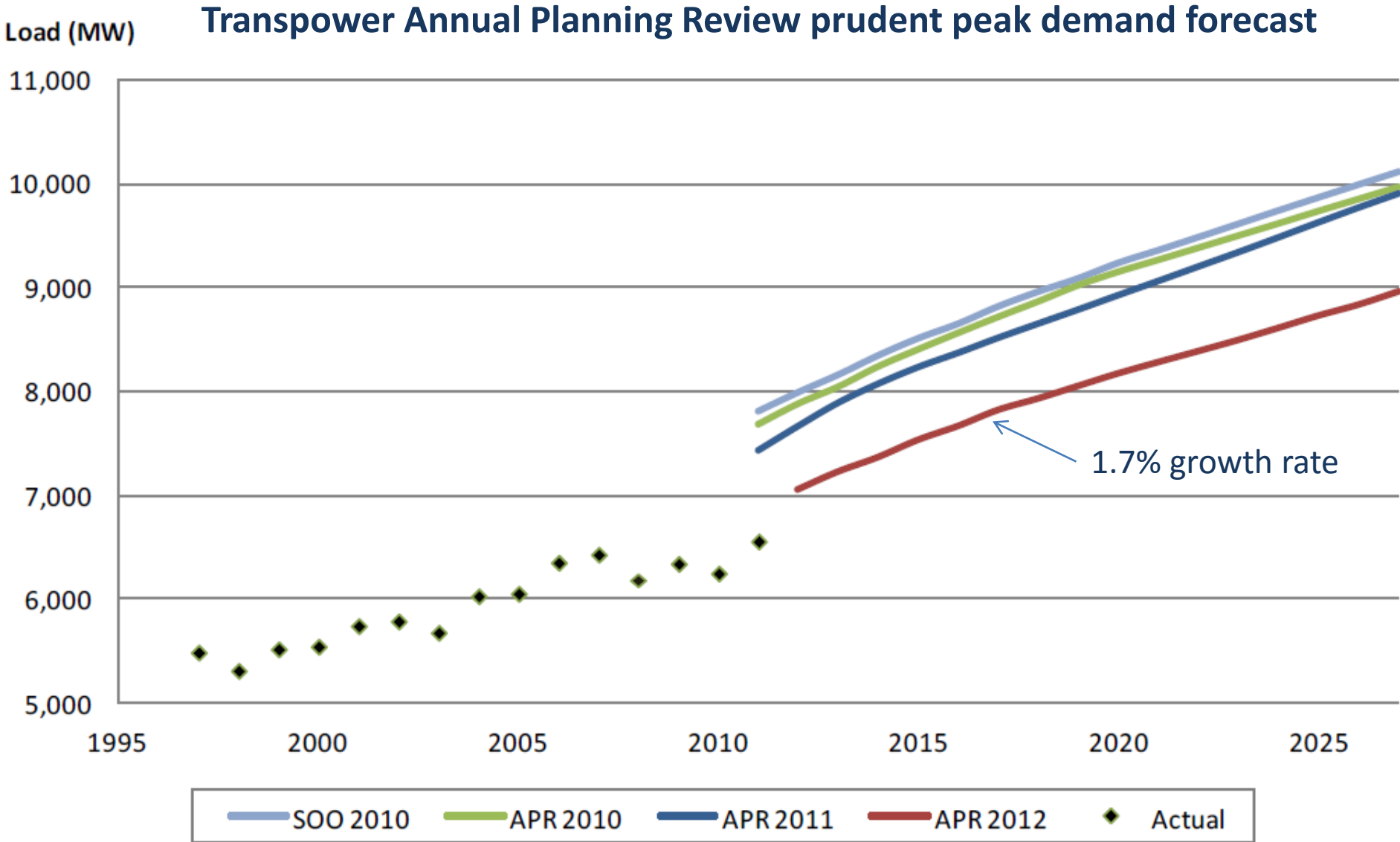


Future gas prices are also softening

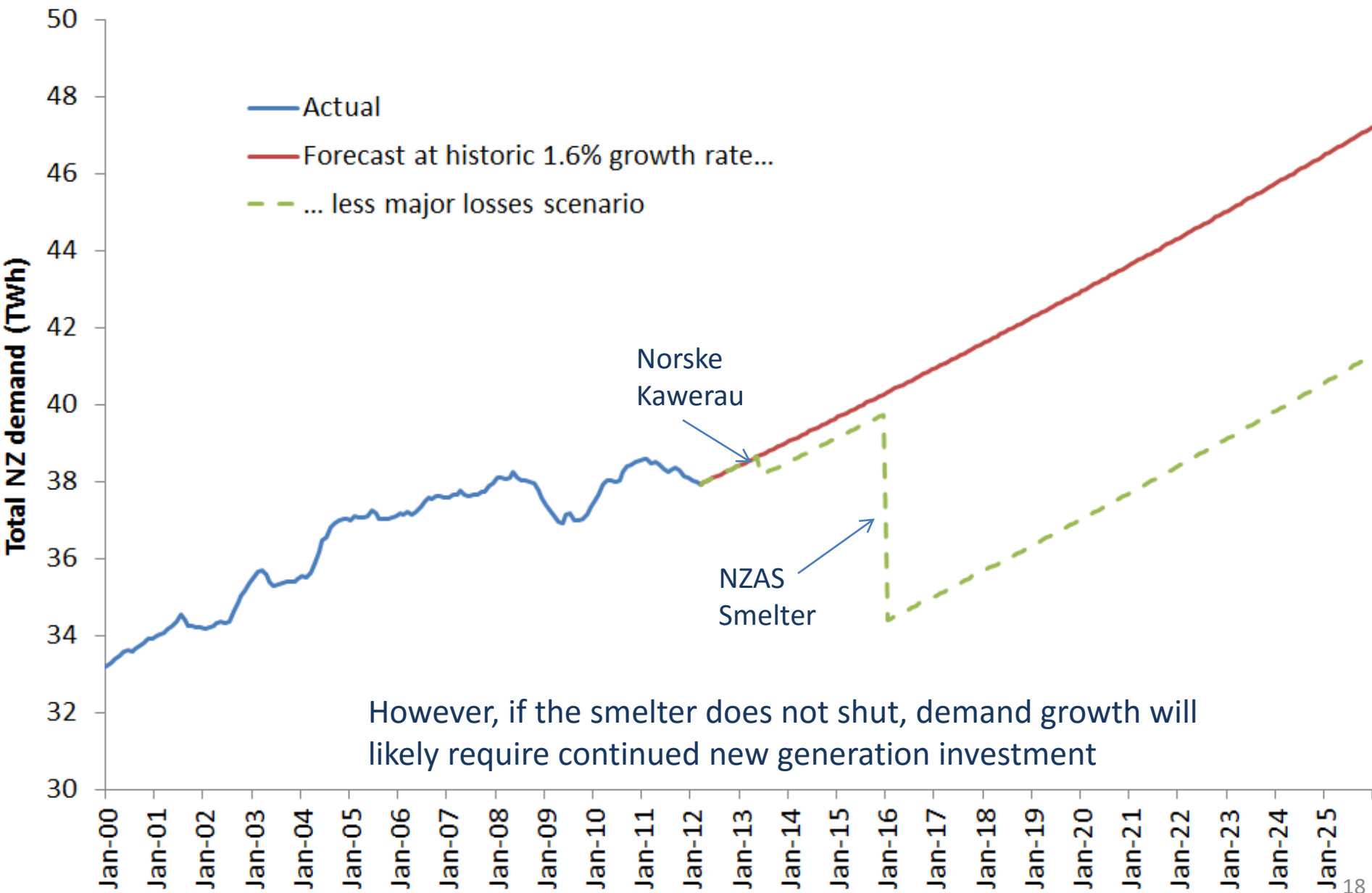


- Lower wholesale electricity and gas prices may start to reverse the decline in energy demand
- However, the international economic climate will continue to be a critical driver in near term

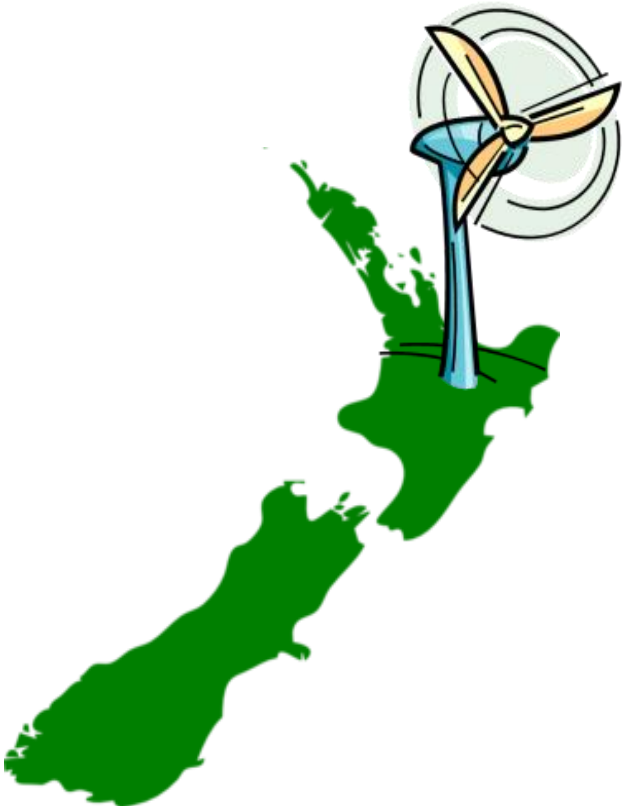
Most parties are now reducing their demand forecasts



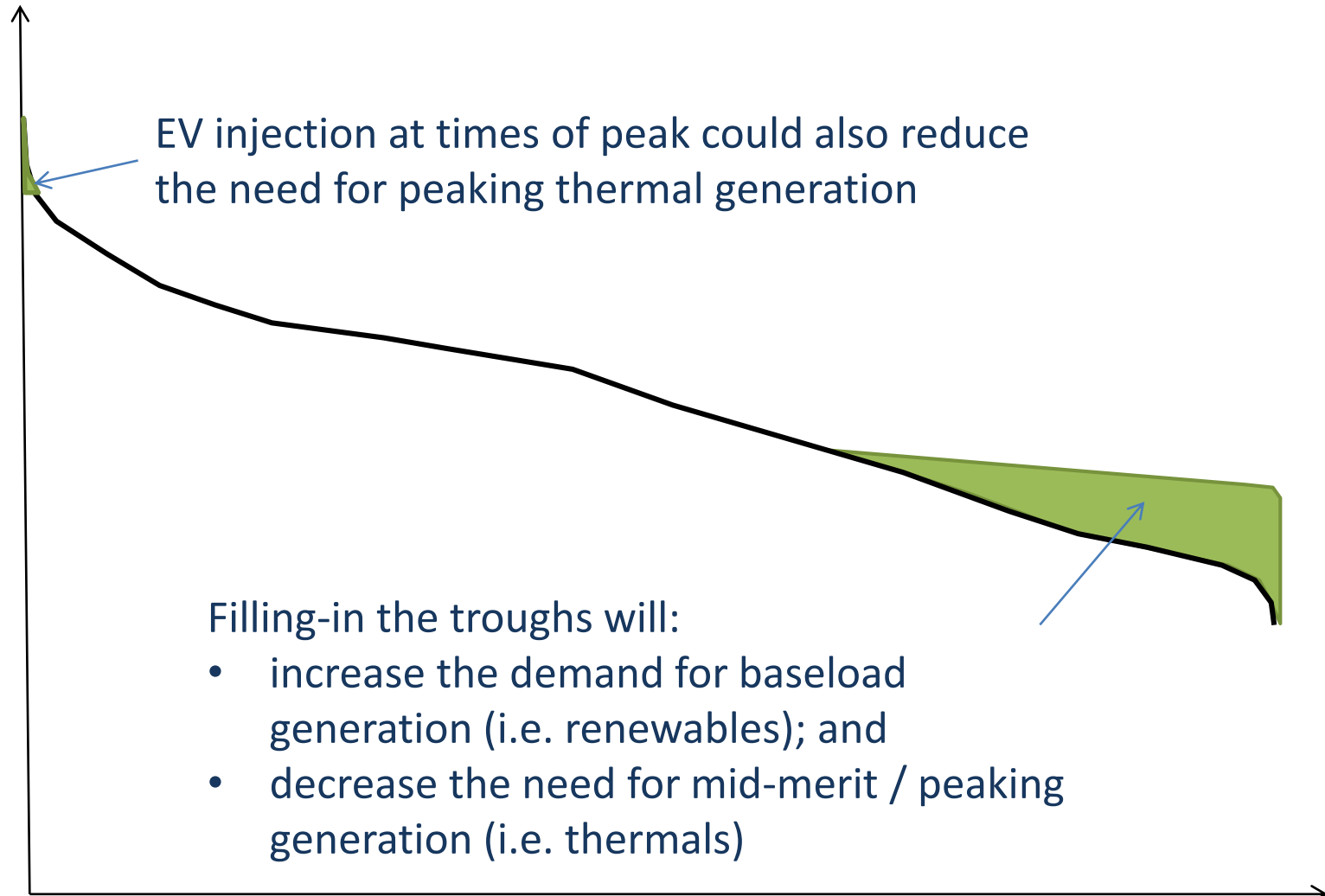
If the smelter were to shut down, it could be almost 10 years before electricity demand grew back to current levels



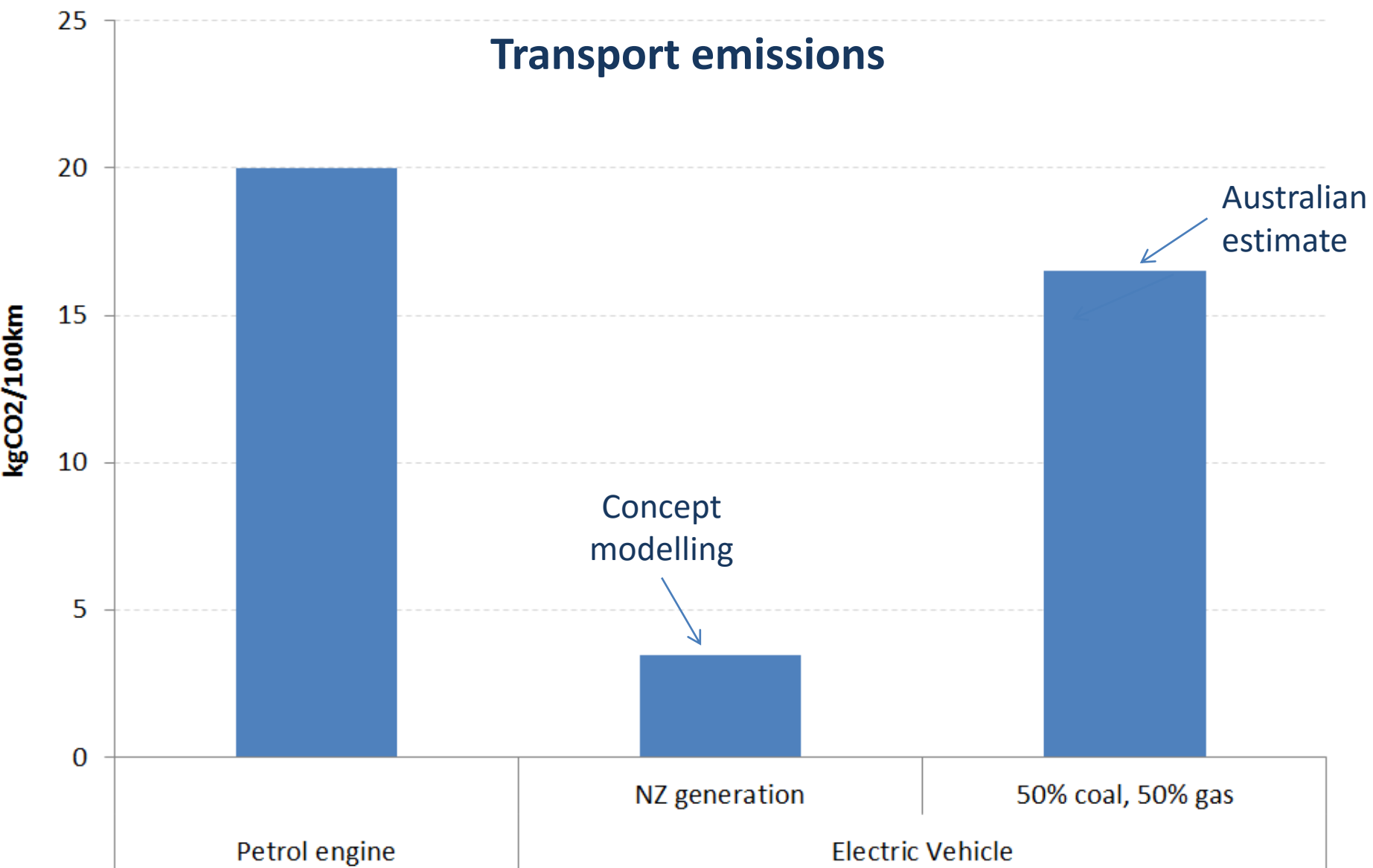
NZ Wind and Electric Vehicles – a marriage made in heaven



Re-charging EVs overnight could substantially increase baseload demand



Unlike most countries, New Zealand EVs would be predominantly renewable



Summary

- Near-term demand growth subdued by transient factors
 - Global financial crisis
 - Christchurch earthquake
- Medium-term demand growth likely to be positive, but at lower average rate than history (due to continuing structural change in NZ economy)
- ‘Wildcards’ could change outlook
 - EVs could significantly boost demand for renewable energy
 - Small-scale embedded generation similar to Australia could materially reduce the demand for grid-generation.
 - However, economics of solar embedded gen in NZ are fundamentally different to that of Australia