

Renewable and climate change policy – where to from here?

Tim Nelson

July 2015

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The science

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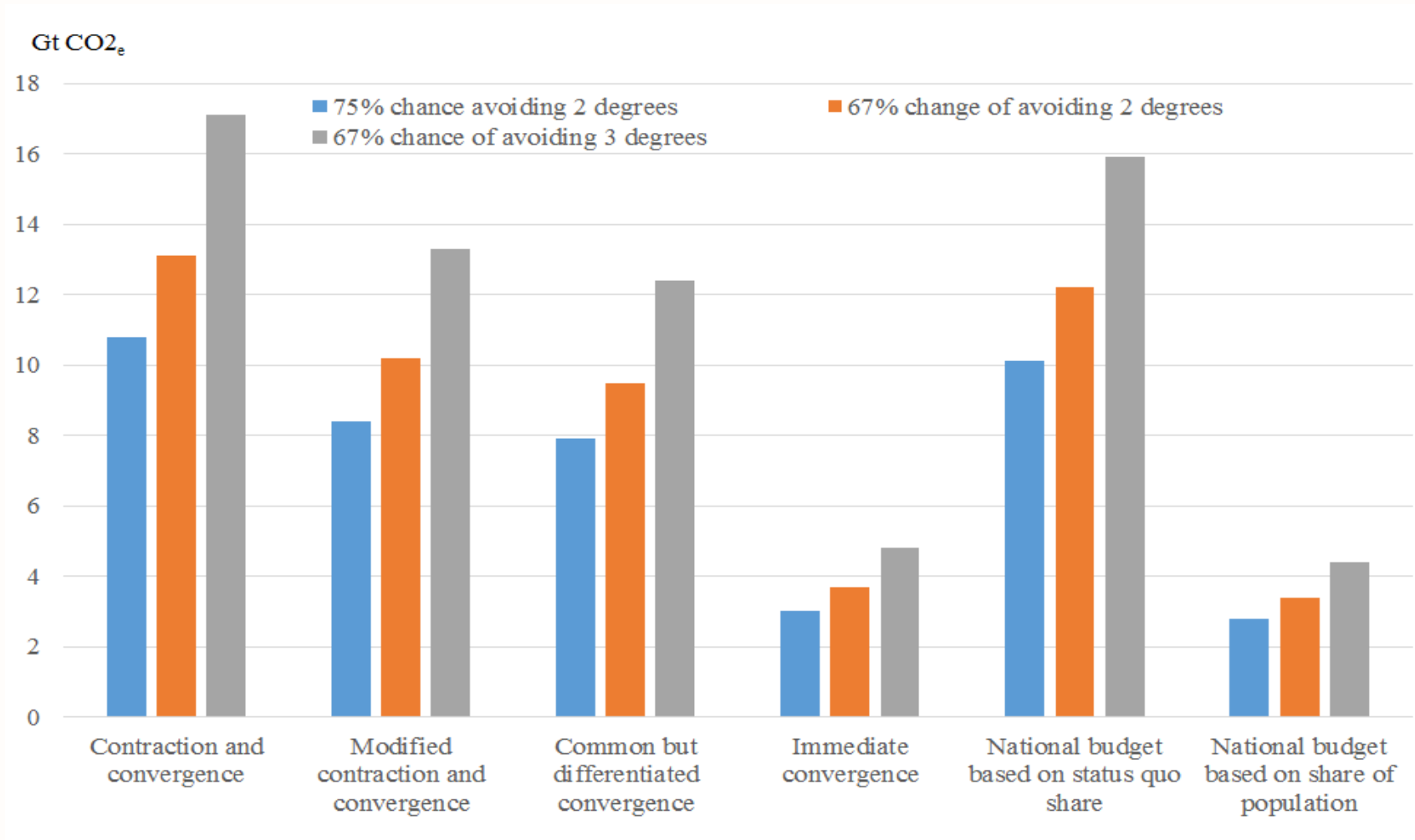
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A national carbon budget for Australia

10 Gt under the most 'generous' of 2°C allocations

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Energy-only markets and renewables

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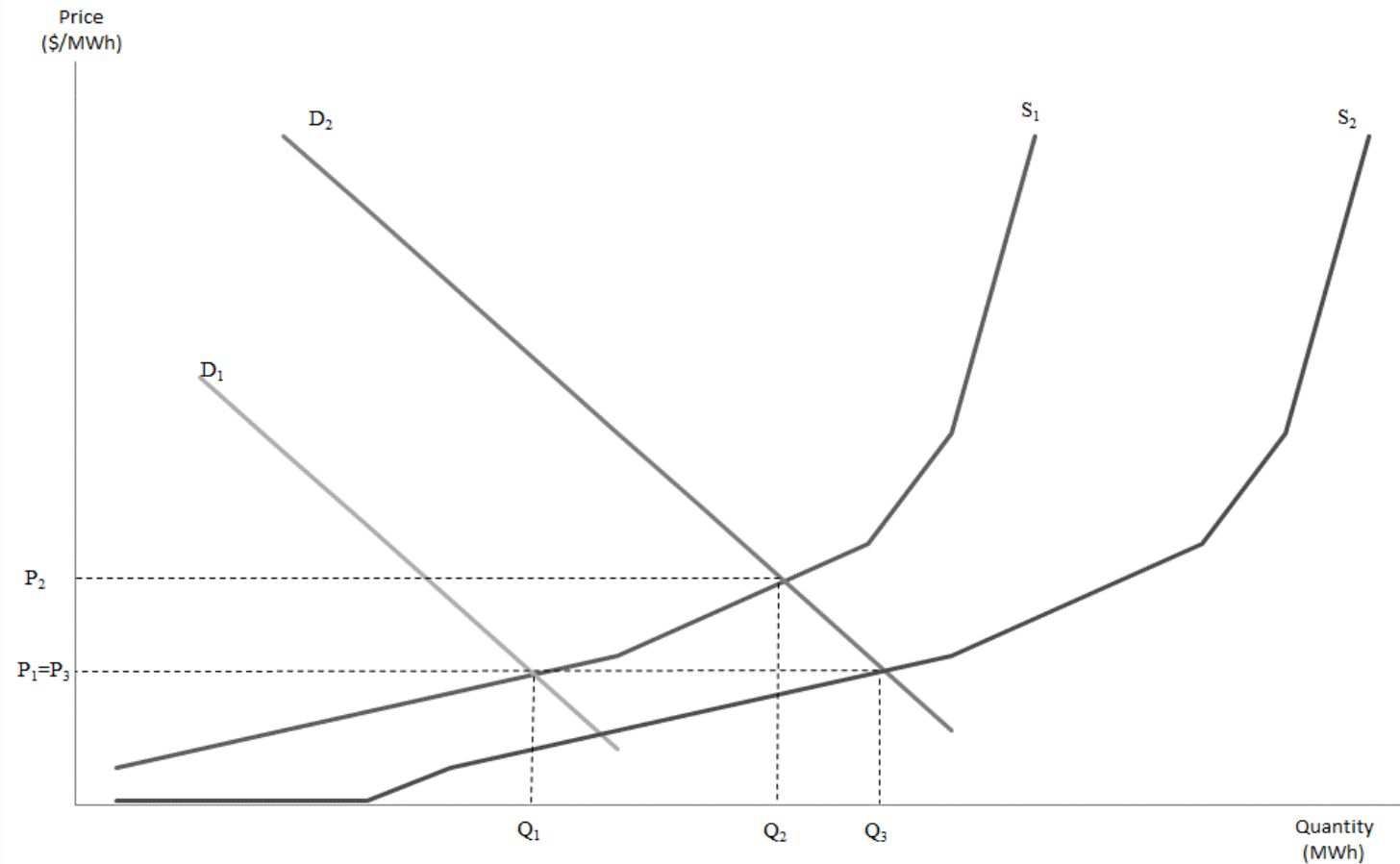
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Energy-only markets and RET

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New electricity demand was expected to match policy-induced new supply



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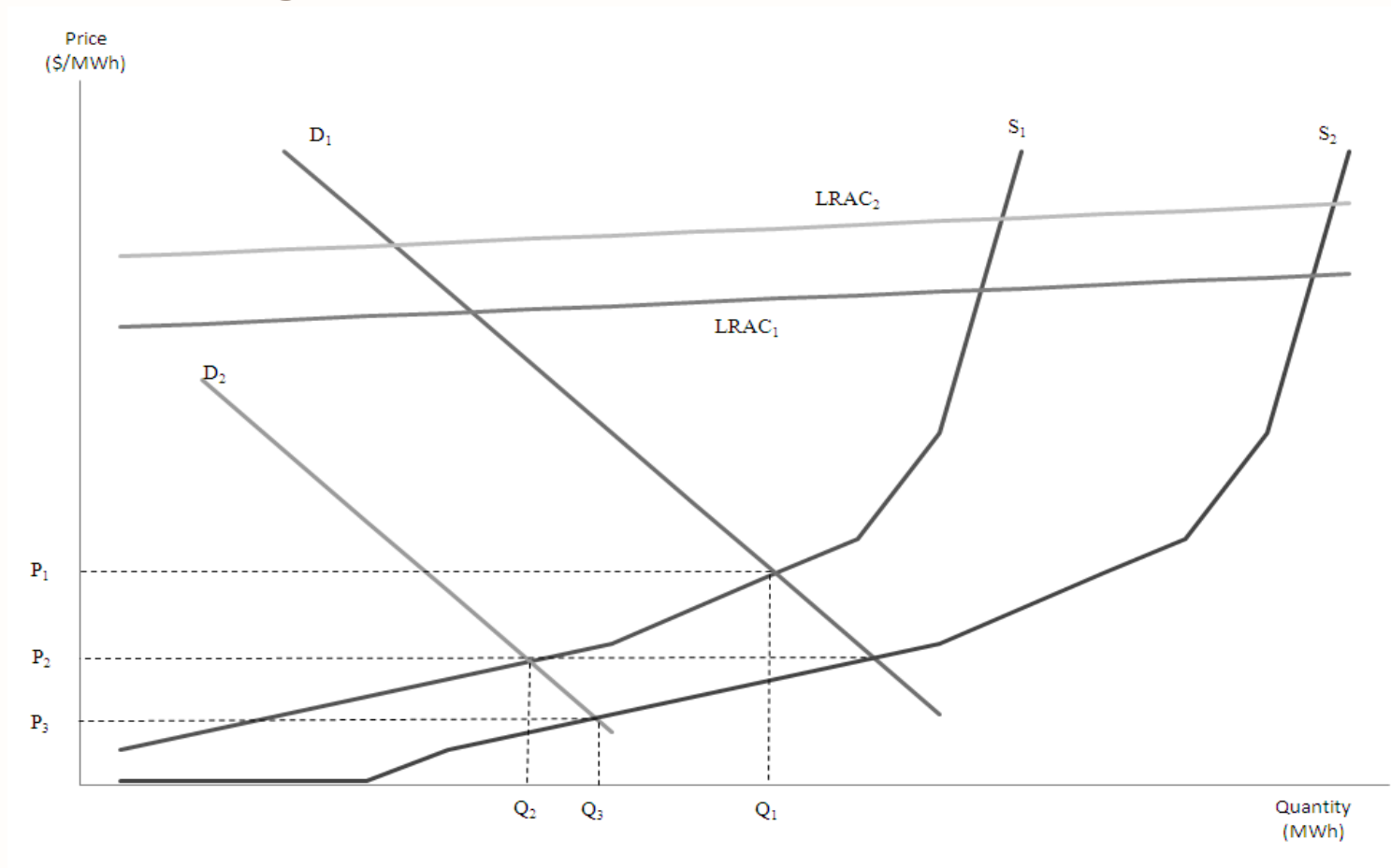
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Energy-only markets and RET

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But demand declined and new capacity was added...older capacity didn't retire in large volumes



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What has happened in practice?

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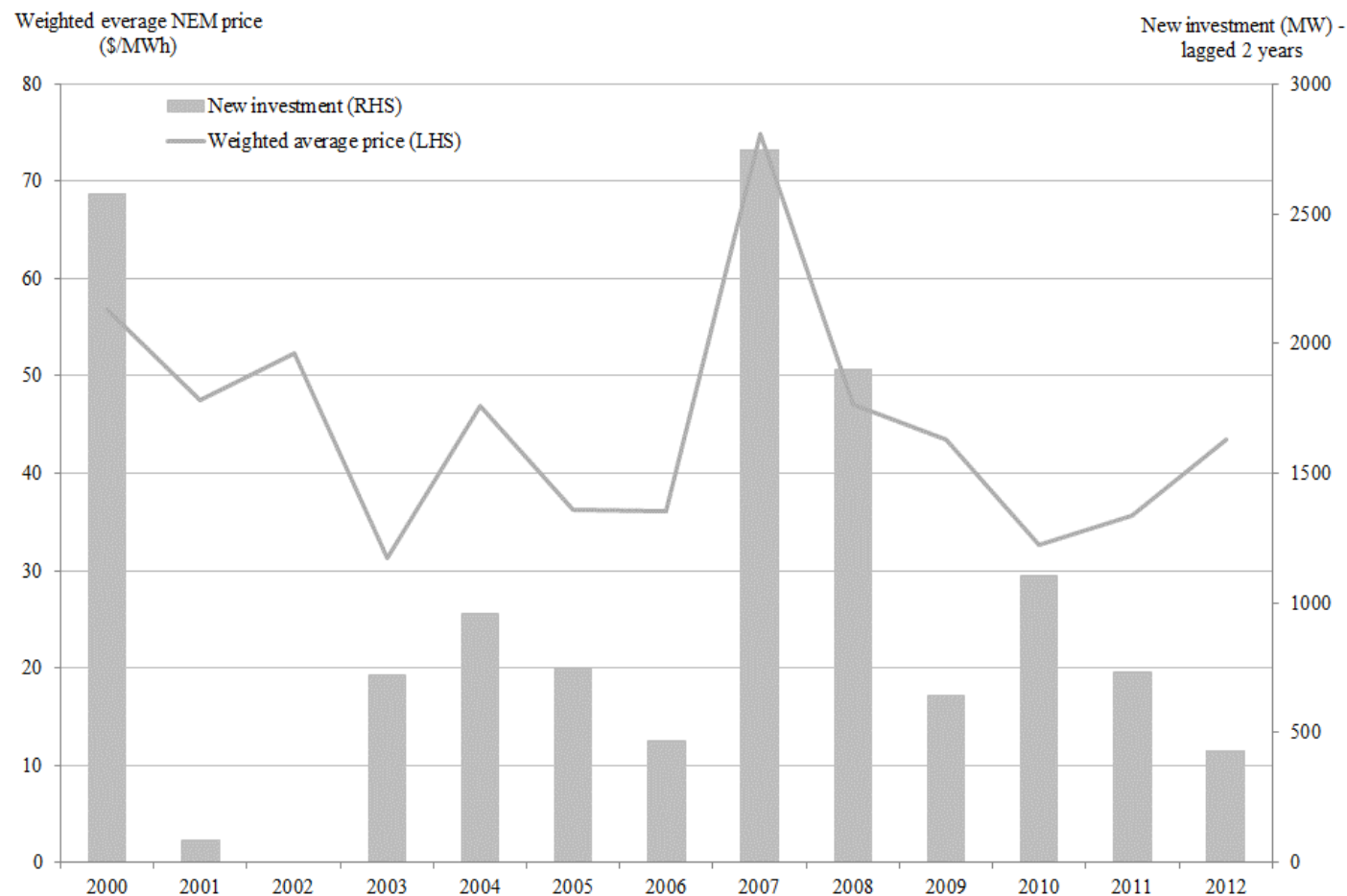
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Energy-only markets

Price and new capacity

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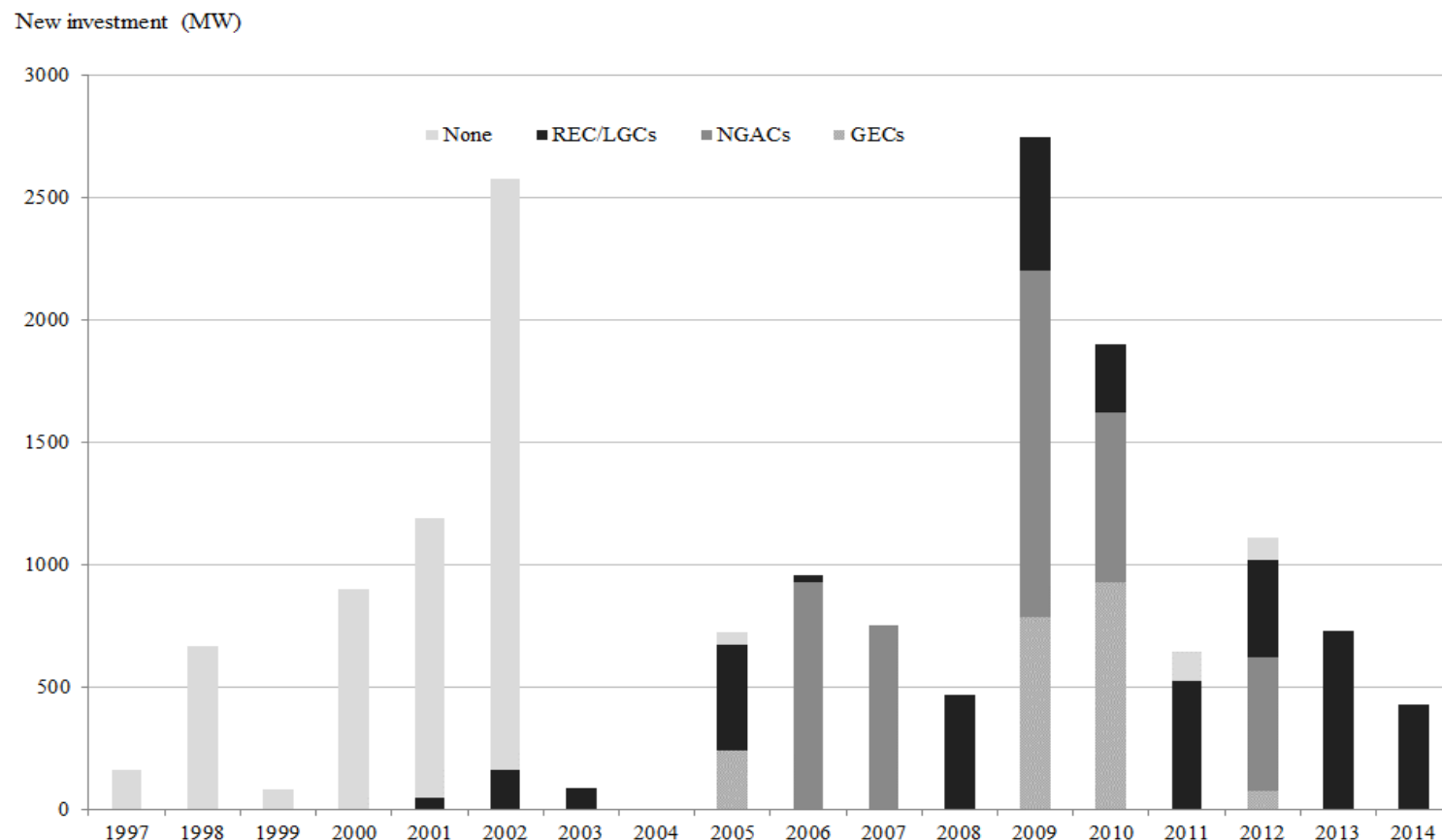
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Policy induced capacity...

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Policies have been introduced which have created significant incentives for new capacity despite a demand/supply balance not warranting it



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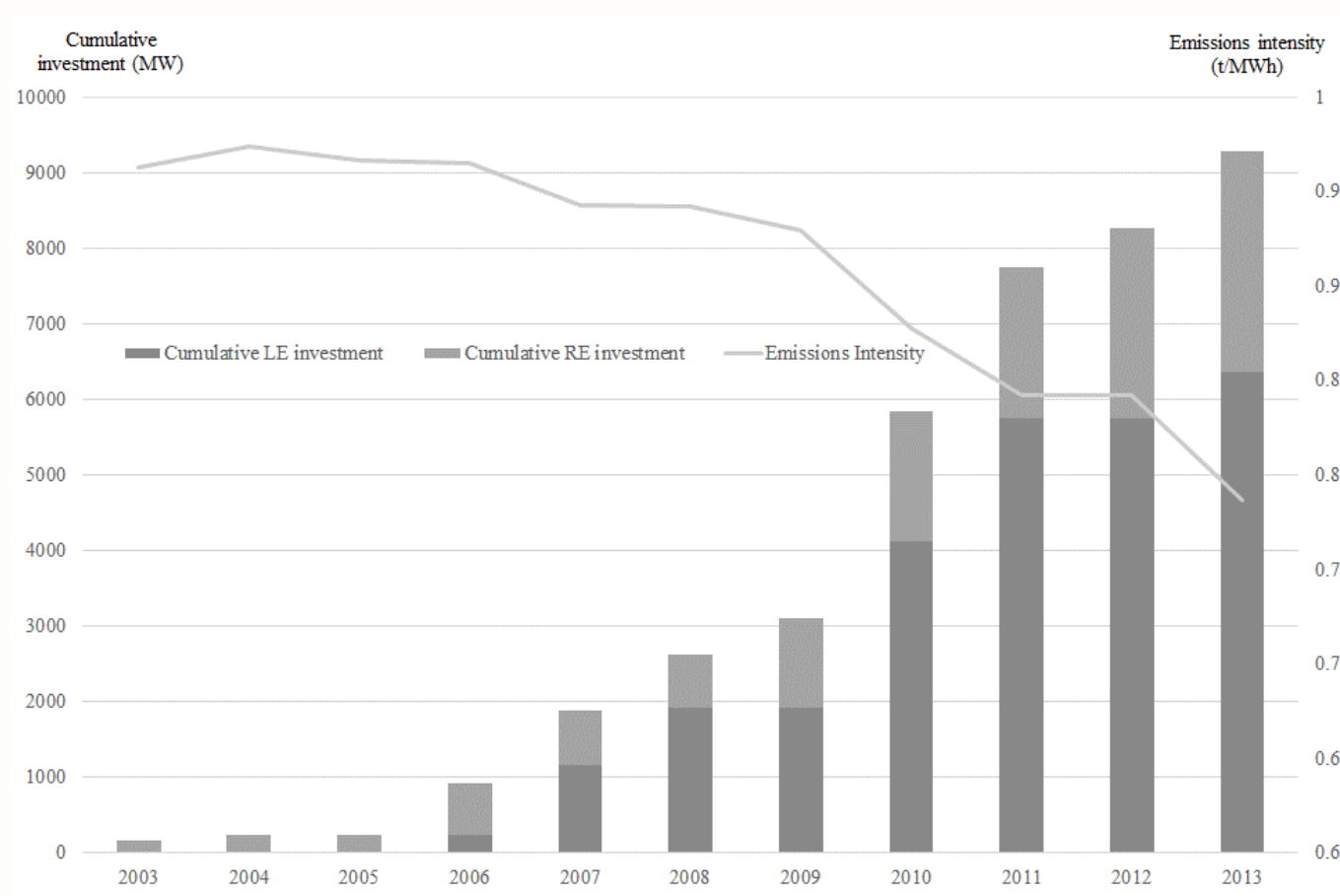
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Policy induced capacity...

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On one measure, greenhouse intensity, policy has been very successful with a material decline in emissions intensity



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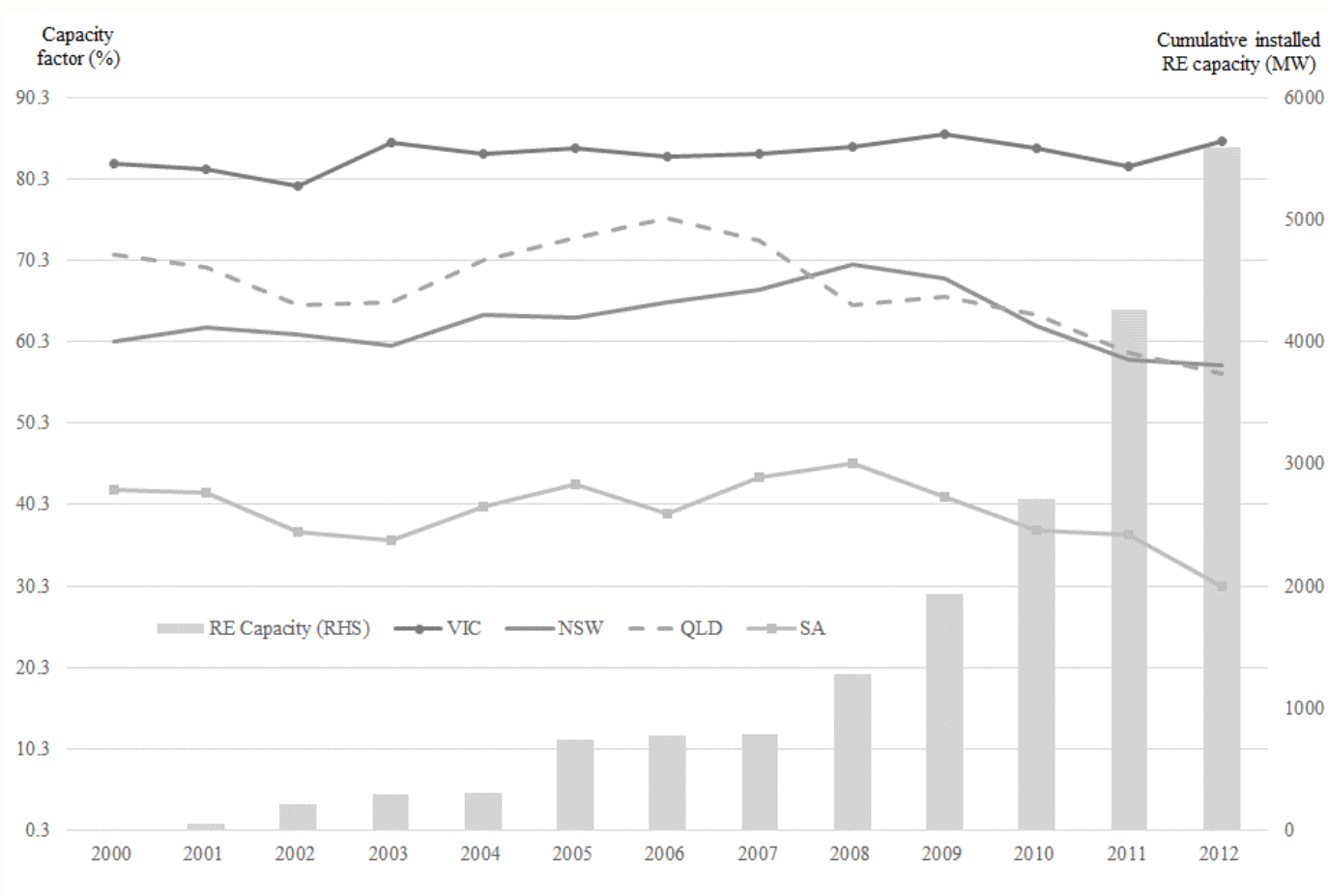
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Policy induced capacity...

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But capacity factors for existing plants have fallen – in an energy-only market, this has reduced revenues for all participants



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Optimal plant mix results

Market is significantly oversupplied – but there is also a structural imbalance between peaking and base/intermediate

Plant Type	Optimal Mix	Actual Mix (2013)	Imbalance	Weighting
Baseload	20,345	30,508	10,162	overweight
Intermediate	3,697	6,077	2,379	overweight
Peaking	17,356	11,730	-5,807	underweight
Total	41,579	48,314	6,736	oversupply

When corrected for policy-induced capacity, the oversupply dissipates but the structural imbalance remains

Plant Type	Optimal Mix	Actual Mix (2013)	Imbalance	Weighting
Baseload	20,345	27,995	7,649	overweight
Intermediate	3,697	2,403	-1,294	underweight
Peaking	17,356	11,730	-5,806	underweight
Total	41,579	42,127	584	oversupply

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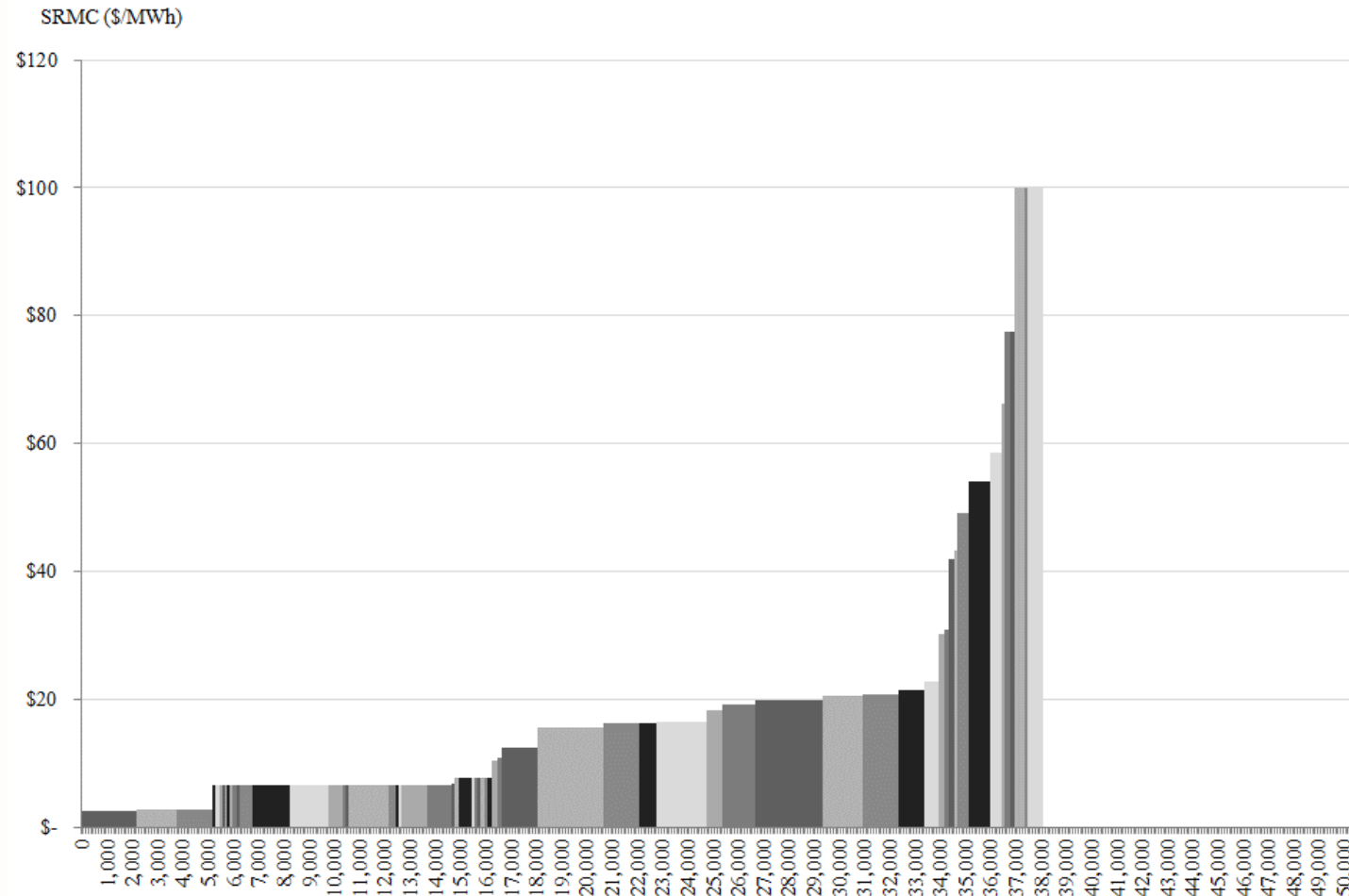
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Barriers to exit?

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The evidence – supply curve in 1998 and today



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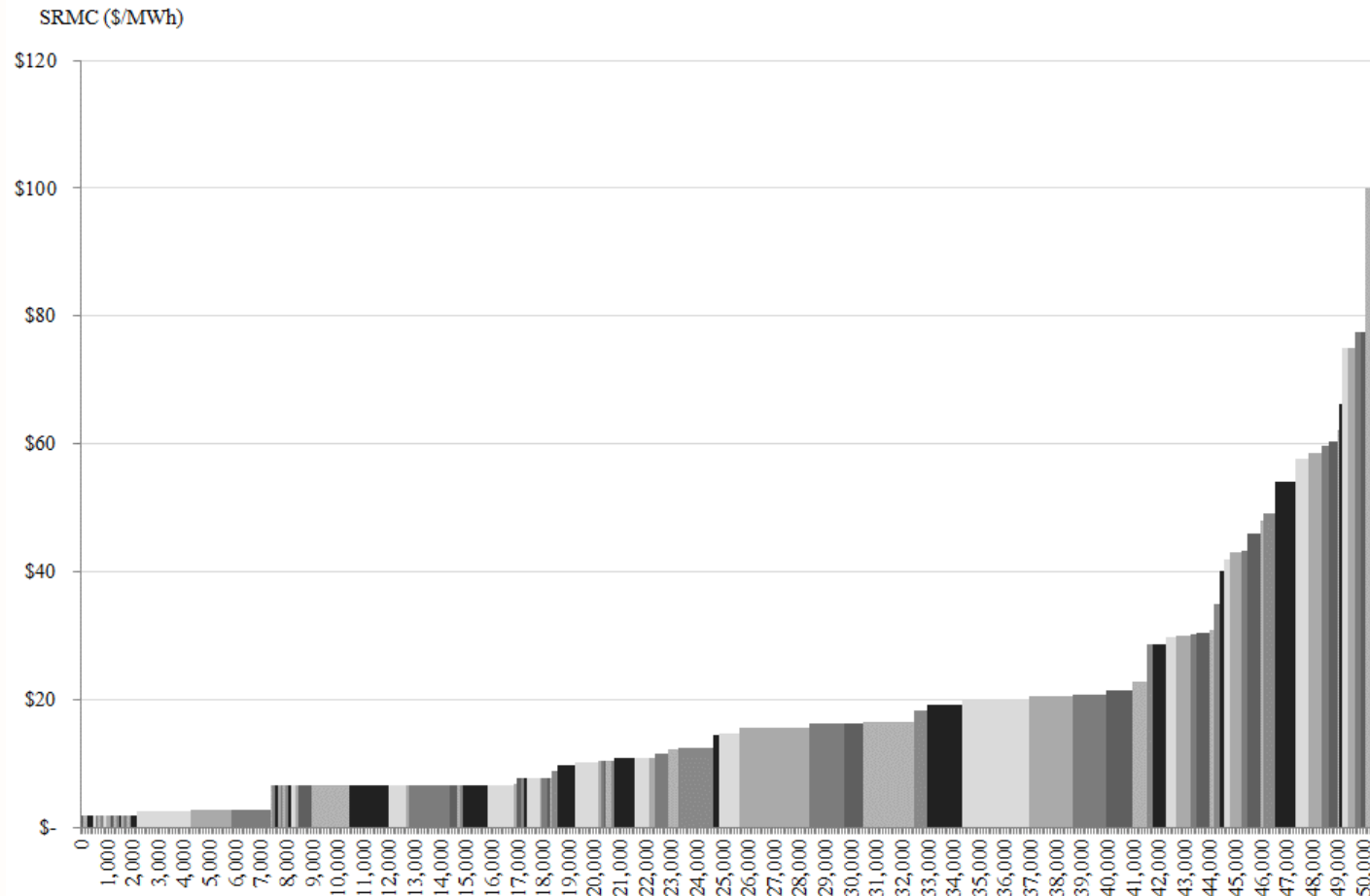
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Barriers to exit?

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The evidence – supply curve in 1998 and today



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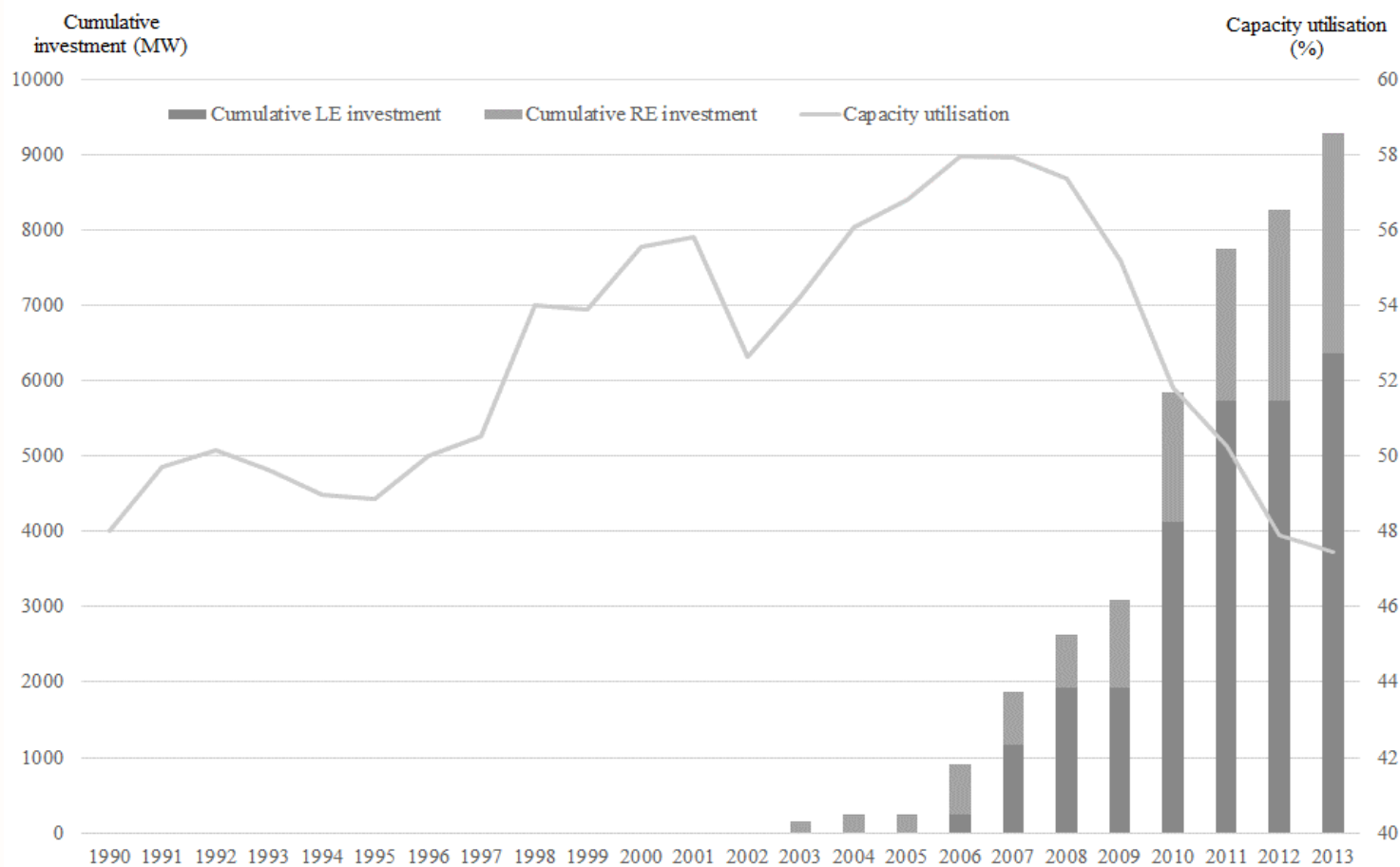
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Capacity utilisation....

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Demand declining and new policy-induced capacity has led to reductions in capacity utilisation



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What are the other issues?

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Barriers to exit?

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Given the trend towards low-emitting asset investment, why aren't more old plants being decommissioned?

Policy uncertainty:

- Why would you do anything?

Asset sweating:

- Run coal plant as intermediate
- 72% of the existing steam plant fleet has passed design life

First mover disadvantage:

- Advantage other competitors when capital is scarce

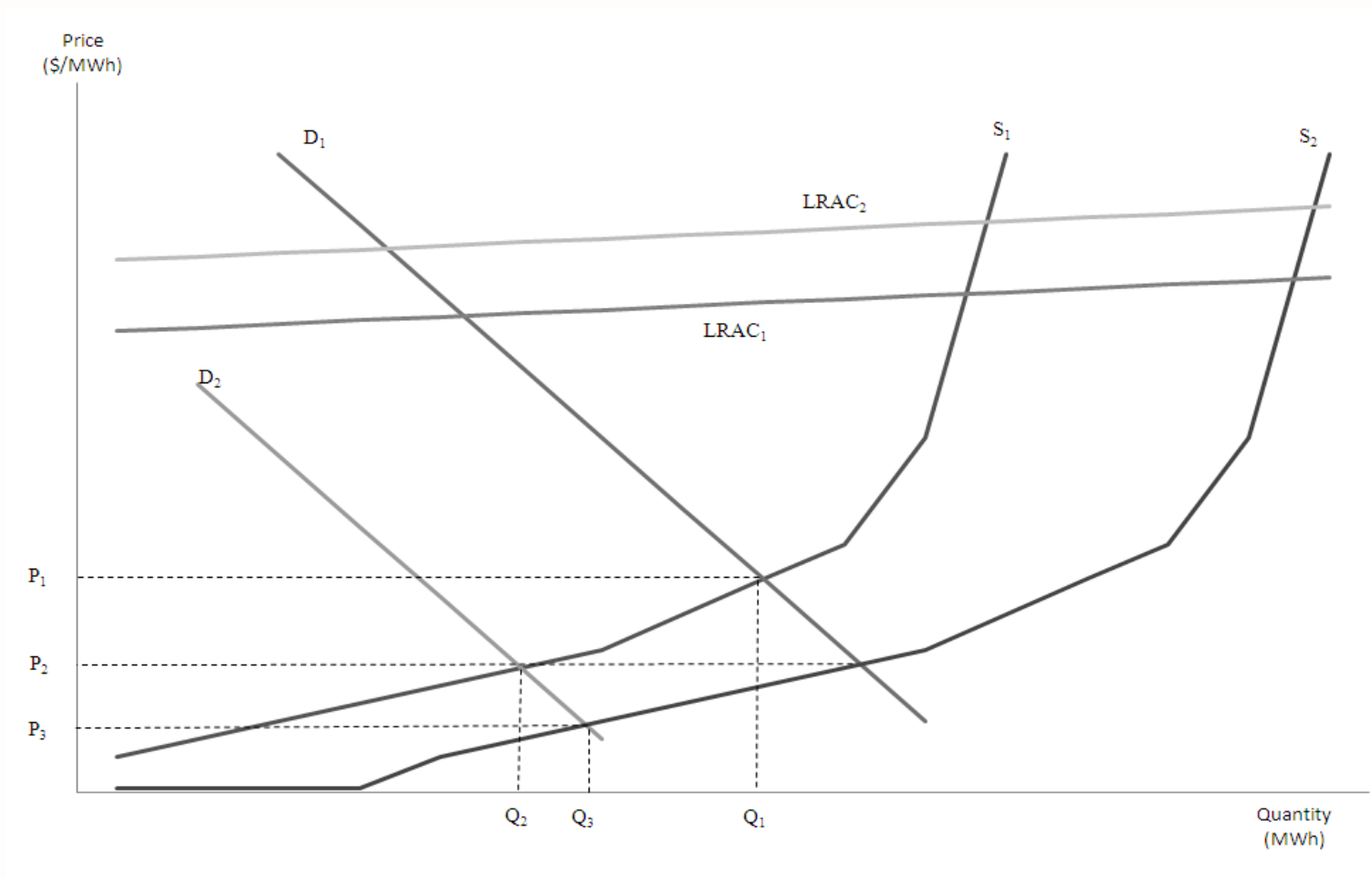
Remediation cost:

- Unknown (but large)

Is the status quo energy-only NEM sustainable?

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Key question for policy makers relates to sustainability of NEM design - how will ca.75% of plant beyond its original design life be replaced?



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Strategic risks and opportunities

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Largely ignored strategic risk is related to our export revenues

Australian strategic advantage in energy resources

- › Australia has 33%, 10% and 2% respectively of the world's uranium, coal and gas resources
- › Around one-quarter of Australia's export revenues from goods are sourced from the sale of coal and other mineral fuels
 - › Likely to rise as the \$60 billion CSG to LNG industry commences production in 2015/16 in Queensland
- › Australian climate policy has largely ignored the risks and opportunities related to these industries
 - › Australian policy cannot influence global demand for these products
 - › Technological development focused on emission reductions could reduce other nation's reliance on these fuels
 - › It is in Australia's interests to participate in policy that reduces the emissions footprints of these technologies

International
experience

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US

- › Climate Action Plan underpinned by the *Clean Air Act*
- › US EPA has established two rules
 - › New performance standards establish separate GHG limits on new coal (0.5 t/MWh) and gas generators (0.45-0.5 t/MWh)
 - › State specific GHG emission goals.
- › 'The result, given the inherent constraints on nuclear and renewables and EPA constraints on coal, is that all paths lead to natural gas.' (Mettler-LaFeir and Paul, 2014)

Canada

- › Power stations that are greater than 50 years old must be closed or retrofitted with CCS technology that achieves an emissions profile of around 0.4 tonnes per MWh - equivalent to a CCGT

The policy – where to
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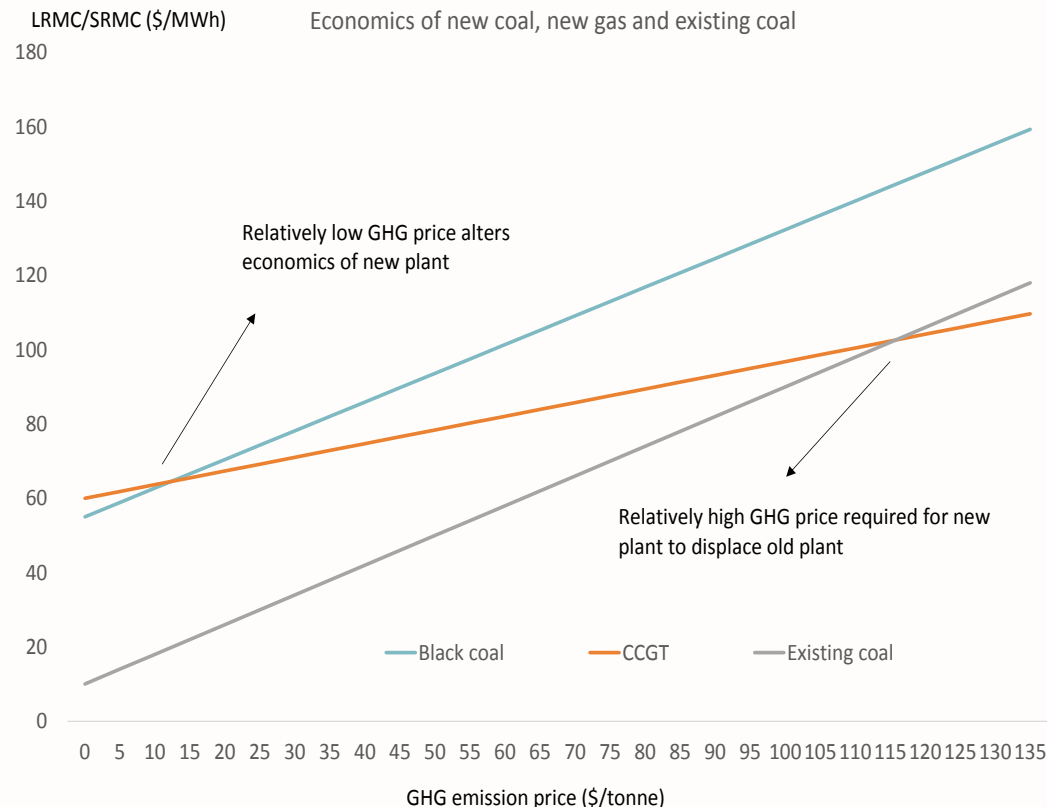
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Implications for Australia

Is carbon pricing the answer?

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- > Carbon pricing debate in Australia has stalled
- > Carbon price of over \$100/tonne required to displace coal
- > International experience
 - > Moving away from carbon pricing
 - > US regulation for new power stations
 - > Canadian regulation for old power stations
- > UNFCCC/COP21 and Australian targets – 2015 an important year



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Are alternatives worth looking at?

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Using existing mechanisms to drive technology development?

- › Policy has been successful at incentivising new electricity generation
- › But demand has declined
- › Financing new renewables requires sustainable LGC and wholesale markets
- › RET requires complementary policy to facilitate sustainable wholesale market outcomes
- › Energy policy should be incorporated into broader decarbonisation/modernisation agenda
- › The elephant in the room – a level playing field.....

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A zero-emissions level
playing field

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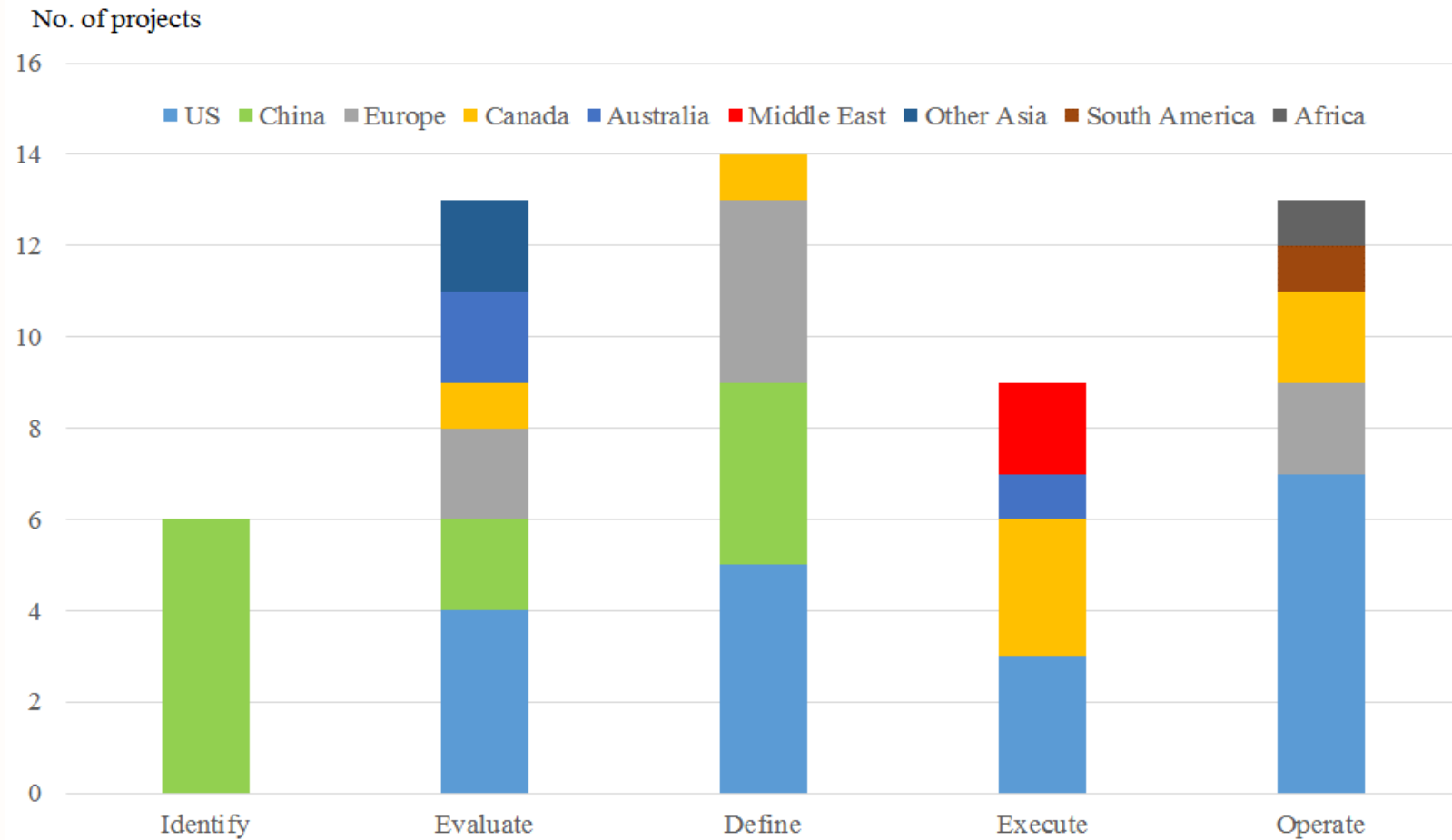
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Are alternatives worth looking at?

Using existing mechanisms to drive technology development - CCS?

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Integration of energy/climate policy

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Carbon pricing is a politically contentious topic – it may be time for something new based upon international experience

- › Australian policy could be set in a way that both transitions the domestic power sector and contributes to a level-playing field of technology development
 - › review energy-only NEM design for future of increased intermittency
 - › emissions standards for all new power stations
 - › regulation which drives the progressive closure of older, emissions-intensive power stations or retrofitting with CCS technology
 - › continued incentives for renewable energy (such as the RET) with increased scope to include all zero and near-zero emission energy sources
- › Would acknowledge the significant risks and opportunities for Australia's energy resources in a climate constrained world – may facilitate international policy adoption creating deep markets for zero emission technologies in Australia's strategic interests

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