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Climate Policy: Building a Global Response

Warwick J McKibbin
CAMA, Australian National University
& The Lowy Institute for International Policy, Sydney
& The Brookings Institution, Washington DC



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Overview

- Climate Science and Policy
- The current state of climate policy globally and in Australia
 - The diabolical policy process
- Why Prices Matter
- Lessons from Kyoto
- Post Kyoto Policy
- Conclusion



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What do we know?

- Climate is a complex system that is always changing
- Natural variability and human induced change coexist
- Average global temperatures have risen 0.6 degrees in the past century



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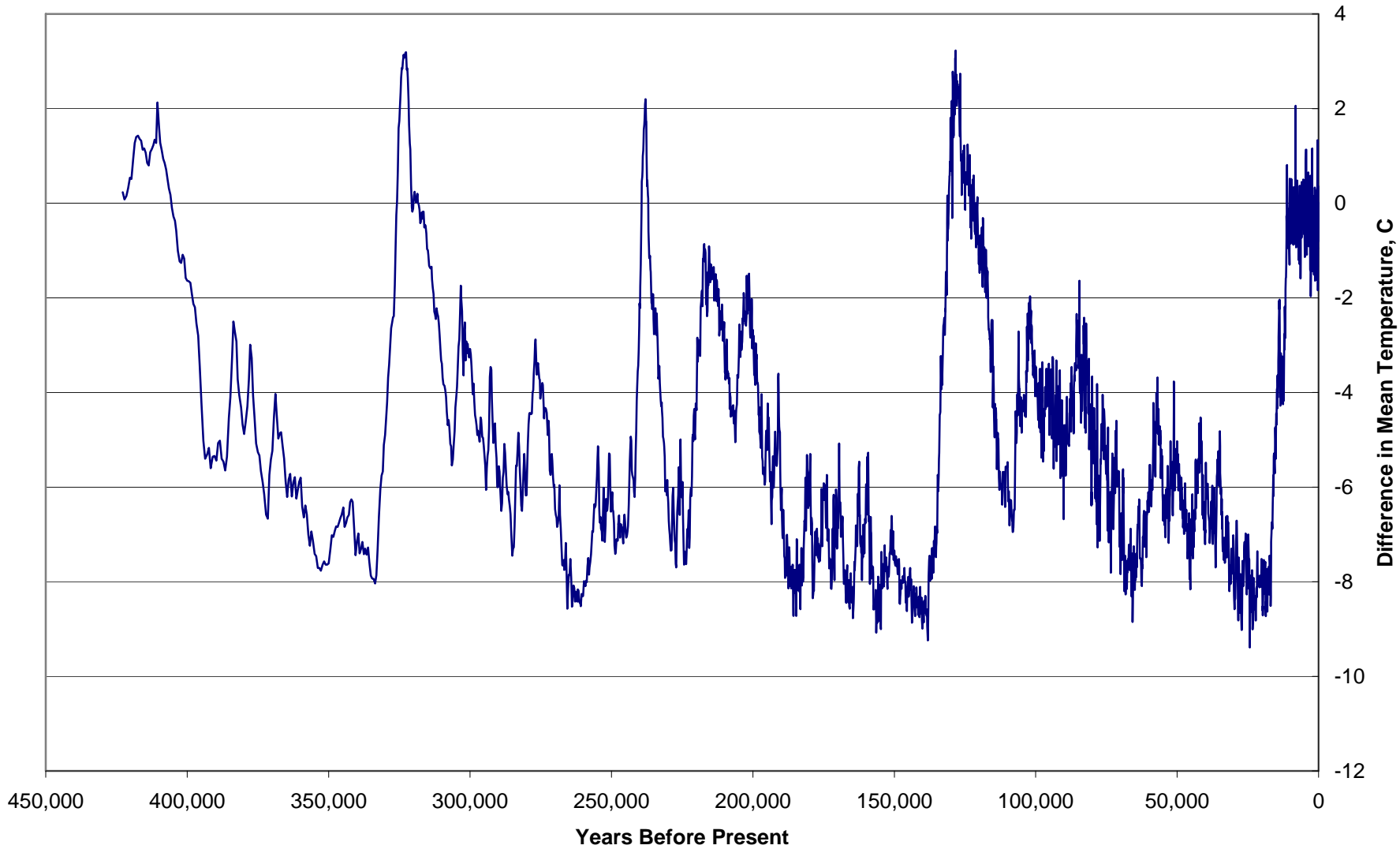
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What do we know?

- Increasing evidence that there is a warming problem but predicted impacts highly uncertain
- We are pumping enormous amounts of greenhouse gases into the atmosphere
- Policy uncertainty is causing economic losses

Figure 2: Global Temperature Record, Vostok Ice Core Data





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Bathtubs

- What matters for the climate are the *concentrations* of greenhouse gases in the atmosphere not the flow of emissions in any year
- Concentrations are the accumulation of greenhouse gas emissions from all sources over time less sinks



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Long and Variable Lags

- Will require both mitigation and adaptation
- Mitigation today reduces adaptation in the future
- Gains for mitigation are on a different time frame to gains from adaptation



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Climate Science

- “Science” does not tell us exactly what the global concentration target should be - but it guides us



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Climate Science

- Even if we knew the concentration target, “Science” does not tell us which of the many global paths for emissions should be followed for a given concentration target



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Climate Science

- Even if we knew the global path for emissions “Science” has nothing to say about what target an individual country should follow



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Climate Change Policy

- Is all about managing risk and dealing with climate uncertainty
- Has moral, social, scientific, technological and economic dimensions



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Climate Change Policy

- Should be about enabling the whole society to manage the risks associated with climate change
- Should be about creating long term institutions and clear policy frameworks that can steer the global economy towards a less carbon intensive future



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What is Needed

- A change in the behaviour of energy users and other greenhouse gas emitters
- Technologies to
 - reduce greenhouse gas emissions
 - reduce energy demand
 - increase energy efficiency



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The Global Policy Process

- **Framework Convention on Climate Change**
- **Conference of the Parties (COP)**
 - COP 3 Kyoto December 1997
 - COP 13 Bali, December 2007
 - COP 14 Poznan, Poland, December 2008
 - COP 15 Copenhagen, December 2009



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The Diabolical Policy Process in Australia

- 2007 Shergold Report of the Howard Government
- 2008 Garnaut Review by the States plus notionally the Rudd government
- 2008 Department of Climate Change with input from Australian Treasury and Garnaut Review
 - Green Paper on Carbon Pollution Reduction Scheme

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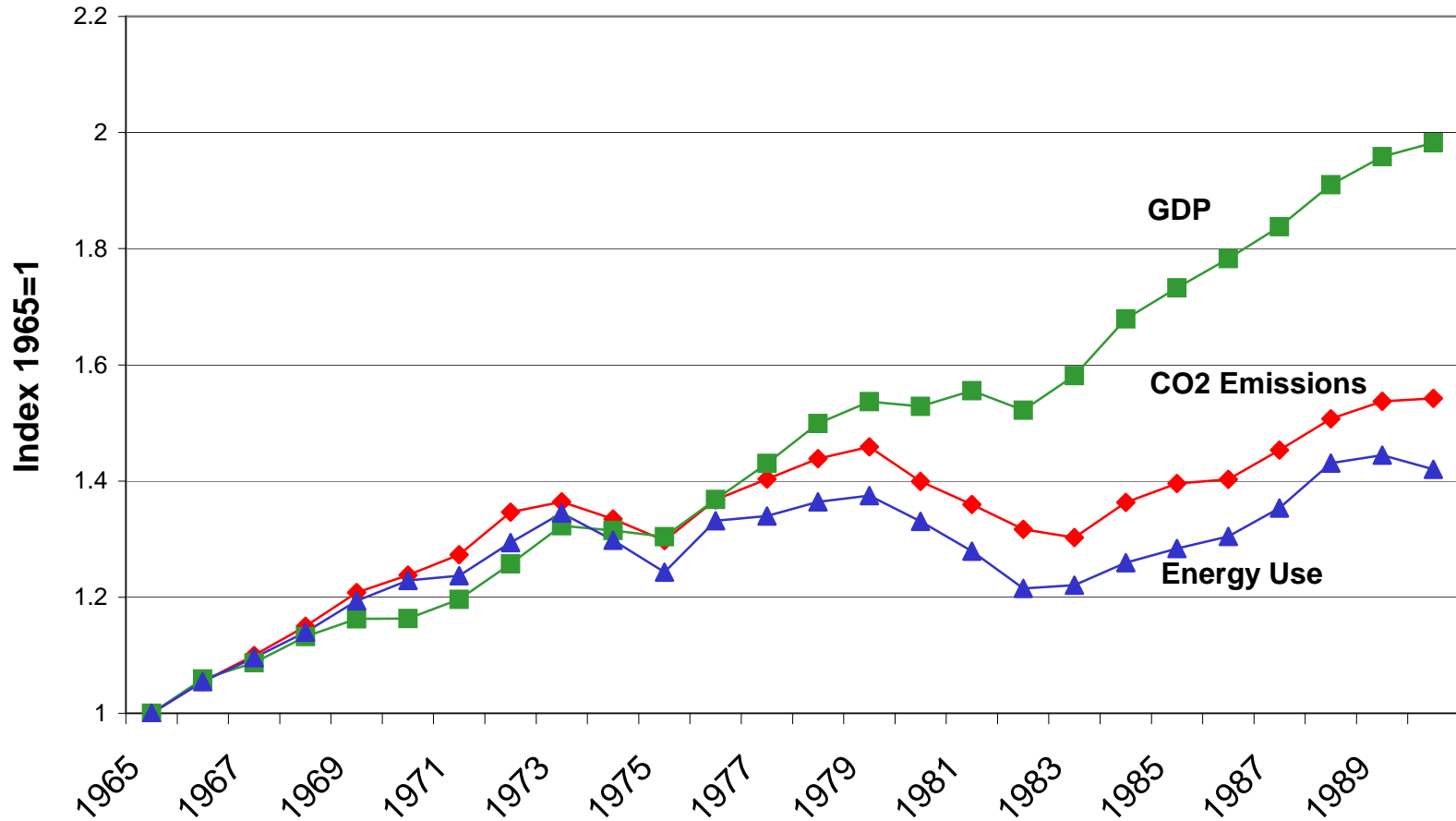


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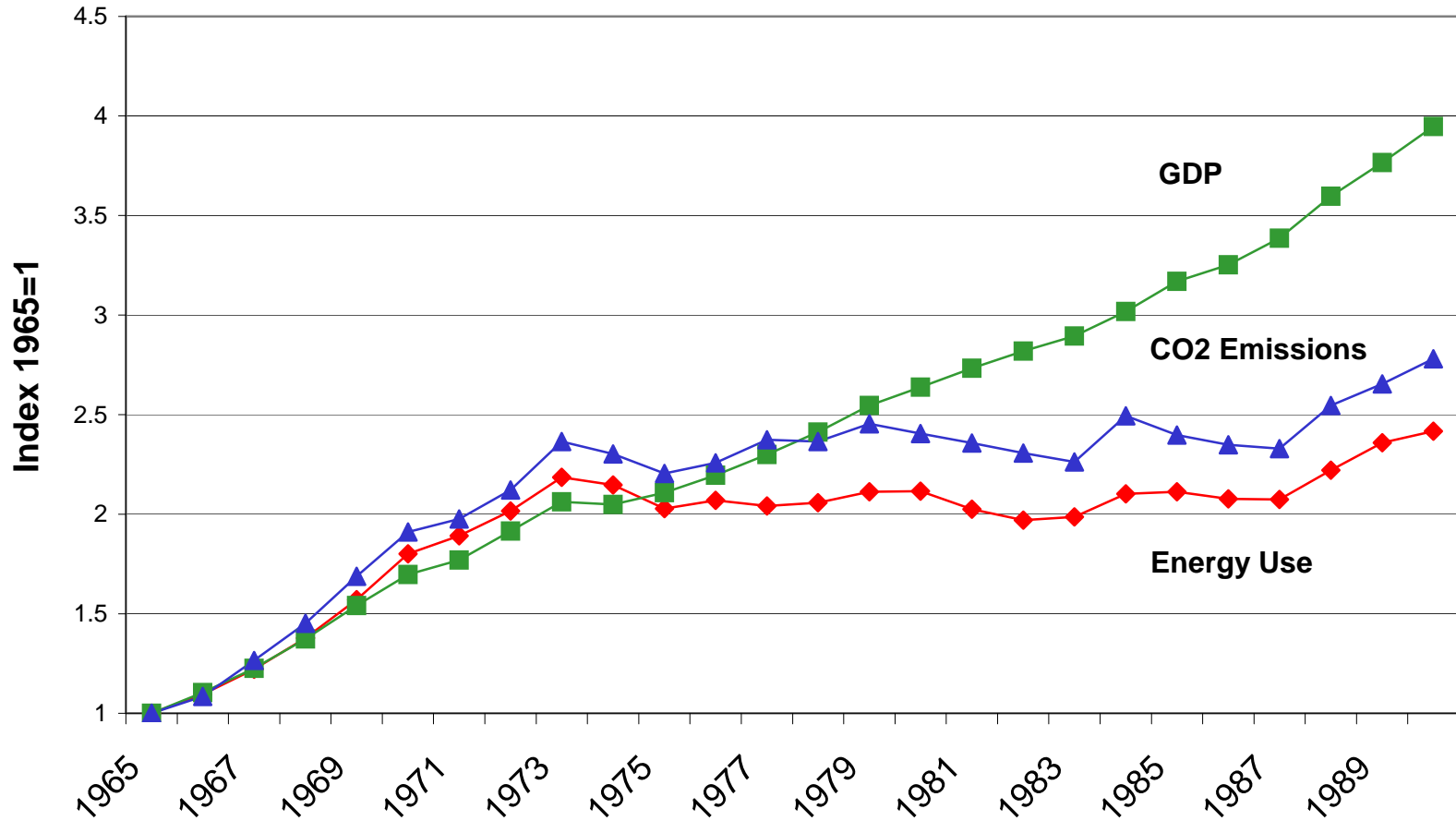
The Role of Prices

**Necessary but not sufficient
Solution**

**Figure 3: GDP, Energy Use, CO2 Emissions
USA**



**Figure 4: GDP, Energy Use, CO2 Emissions
Japan**





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The Role of a Price on carbon

- The long term carbon price drives technology and is an opportunity
- The short term carbon price is an input cost



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The Role of a Price on carbon

- Long term credible carbon prices are crucial for encouraging
 - Demand side management
 - The emergence of alternative technologies
 - The adoption and diffusion of alternative technologies

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How to build a global system?



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Alternative Philosophies

- Negotiate a global system from the top down
 - The Kyoto approach
- Created a global system by cooperating and coordinating policies across key national systems



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Alternative Philosophies

- Pick an emissions target based on the expected costs and expected benefits
 - Targets and timetables (politically popular)
 - Stern and Garnaut
- Require firms have a permit each year (based on a target) for each unit of emissions (permits and emissions are capped)
 - Trade permits in the market
 - Revenue goes to permit owner
 - Emissions certain (targets and timetables) but cost is uncertain



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Alternative Philosophies

- Pick a carbon price based on how much society is willing to pay for insurance against climate change and adjust the price over time
- Charge a fixed preannounced tax for each unit of emissions
 - Revenue goes to the government
 - Emissions uncertain but cost (i.e. the tax) is certain



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Alternative Philosophies

- Create a flexible system with long term targets to tie down credibility but control the short term carbon price with flexibility as we learn about costs and benefits
- Create a Hybrid system similar to the monetary policy framework with long term carbon prices determined by long term targets but short term prices controlled by a central bank of carbon.



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Key Issues

- How well does the climate policy framework withstand shocks in the global economy?
- How does the climate policy framework transmit shocks in the global economy?



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New paper

- “Expecting the Unexpected:
Macroeconomic Volatility and Climate
Policy”
- McKibbin, Morris and Wilcoxon
- www.brookings.edu



Climate Policy should be like monetary policy

- Need clear long term targets (not necessarily timetables) with an independent central bank of carbon charged with reaching those targets at lowest cost to the economy
- Need clear long term prices to drive investment
- Need fixed short term prices to minimize costs



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The McKibbin Wilcoxon Hybrid

- The intellectual basis of the Shergold Report and the Green Paper
 - Clear long term targets
 - Short term cost management
 - Flexibility as new information emerges
 - Flexibility to evolve into whatever global system emerges
- Major difference is how much you tie the hand of government



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McKibbin Wilcoxen Hybrid

- A hybrid of emissions trading and carbon taxes
- A way to implement climate policy as monetary policy
- A national system or a global system



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- **Aim**
 - Impose a long term carbon goal for the world and distribute across economies
 - Generate a long term price for carbon in each country to guide energy related investment decisions
 - Keep short term costs low
 - Provide a way for corporation and households to manage climate risk
 - Each country adopts nationally and cooperate globally



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Components of the Policy - 1

- Long-term permits
 - A bundle of annual permits with different dates for each permit and which expire on that date
 - Quantity of permits over time is the long run goal
 - Supply is fixed (and diminishing) and allocated to households and industry
 - Traded in a market with a flexible price
 - NOT tradable across countries



Why long term permits?

- Lock in long term goal
- Provide financing on the balance sheets of industry and households
 - Not provided by a tax or a permit auction (how do you pay for the technologies for abatement and adaptation? Apply to a bureaucrat?)
- Act as a constraint on backsliding by governments by valuing the credibility of the policy where the assets are held by the voters



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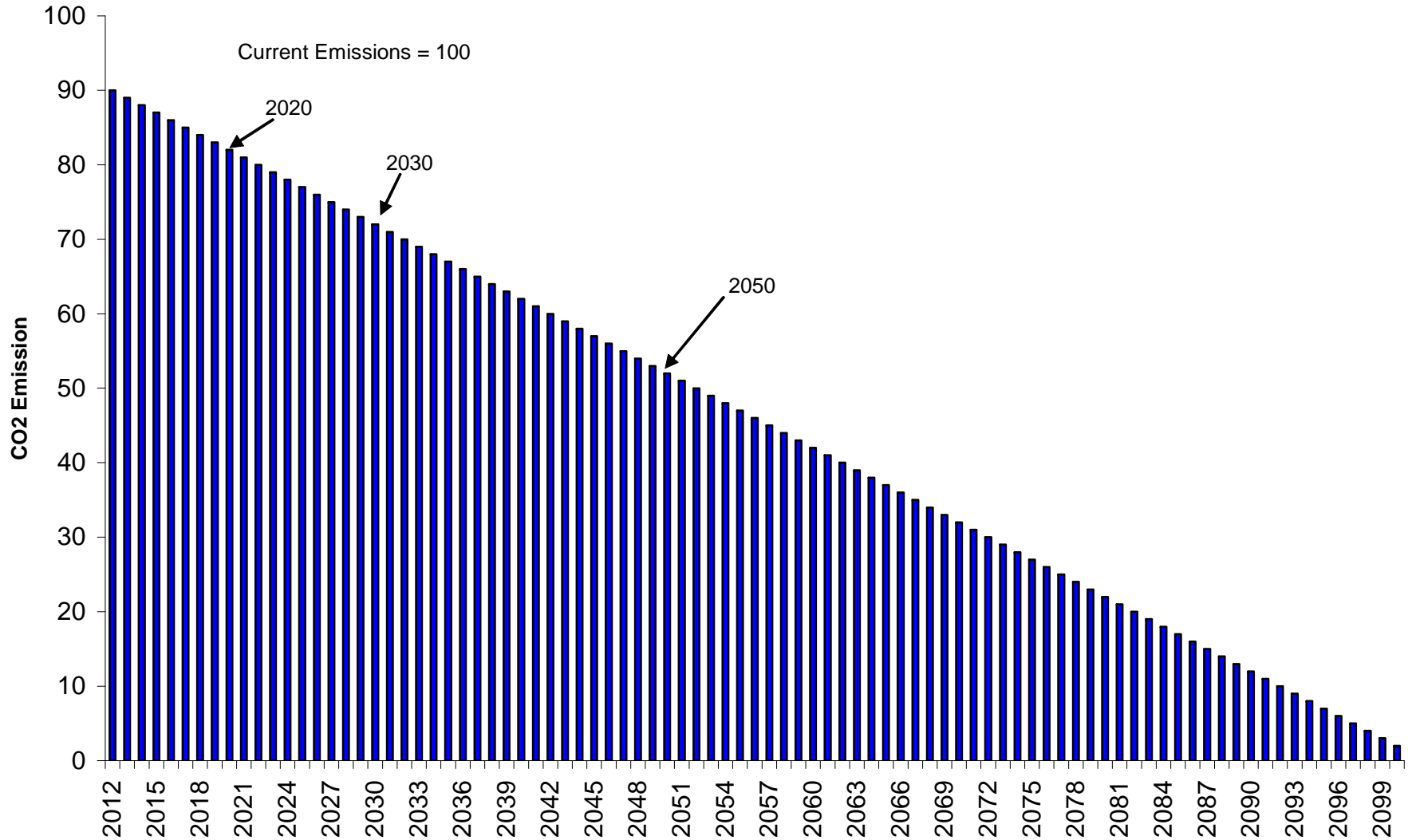
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Long Term Emission Permit





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Components of the Policy - 2

- Annual permits
 - Must be acquitted against carbon emissions in the **year of issue**
 - Expire in year of issue
 - Elastic supply from national government
 - Price fixed for five (or ten) years and then reset given information available
 - Act as a “safety valve” to cap the cost each year but adjusted over time to hit the target



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Short term Carbon price

- In any year companies will use a mix of an annual coupon from the long term permit and annual permits printed by the government for a fixed price to satisfy their emissions
- The price of permits in any year will be fixed at the price of the annual permits
- The long term carbon price is determined in a market

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A Hypothetical Illustration

Fig 1: Long Term Permits in Annex B country

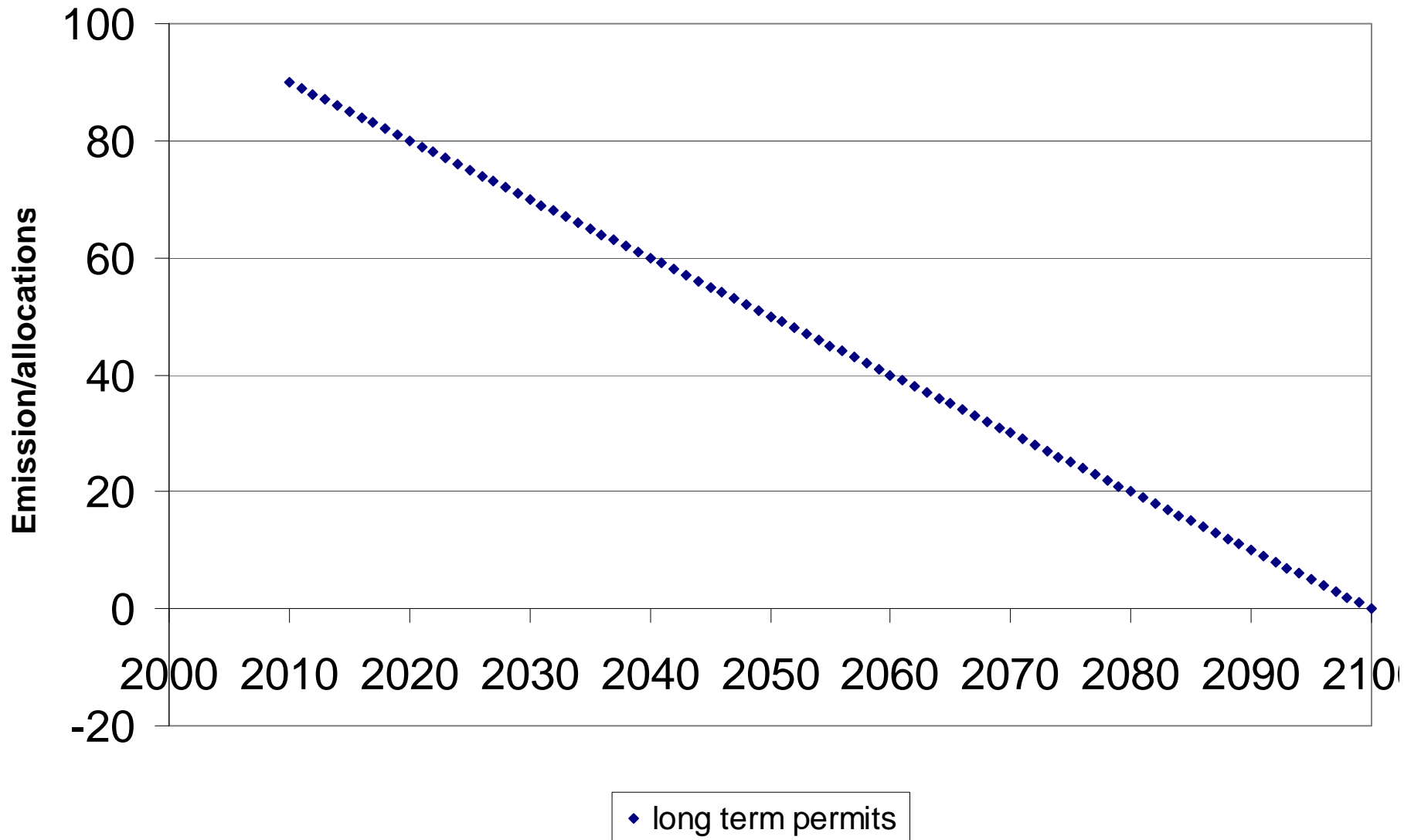


Fig 2: Emissions and Long Term Permits

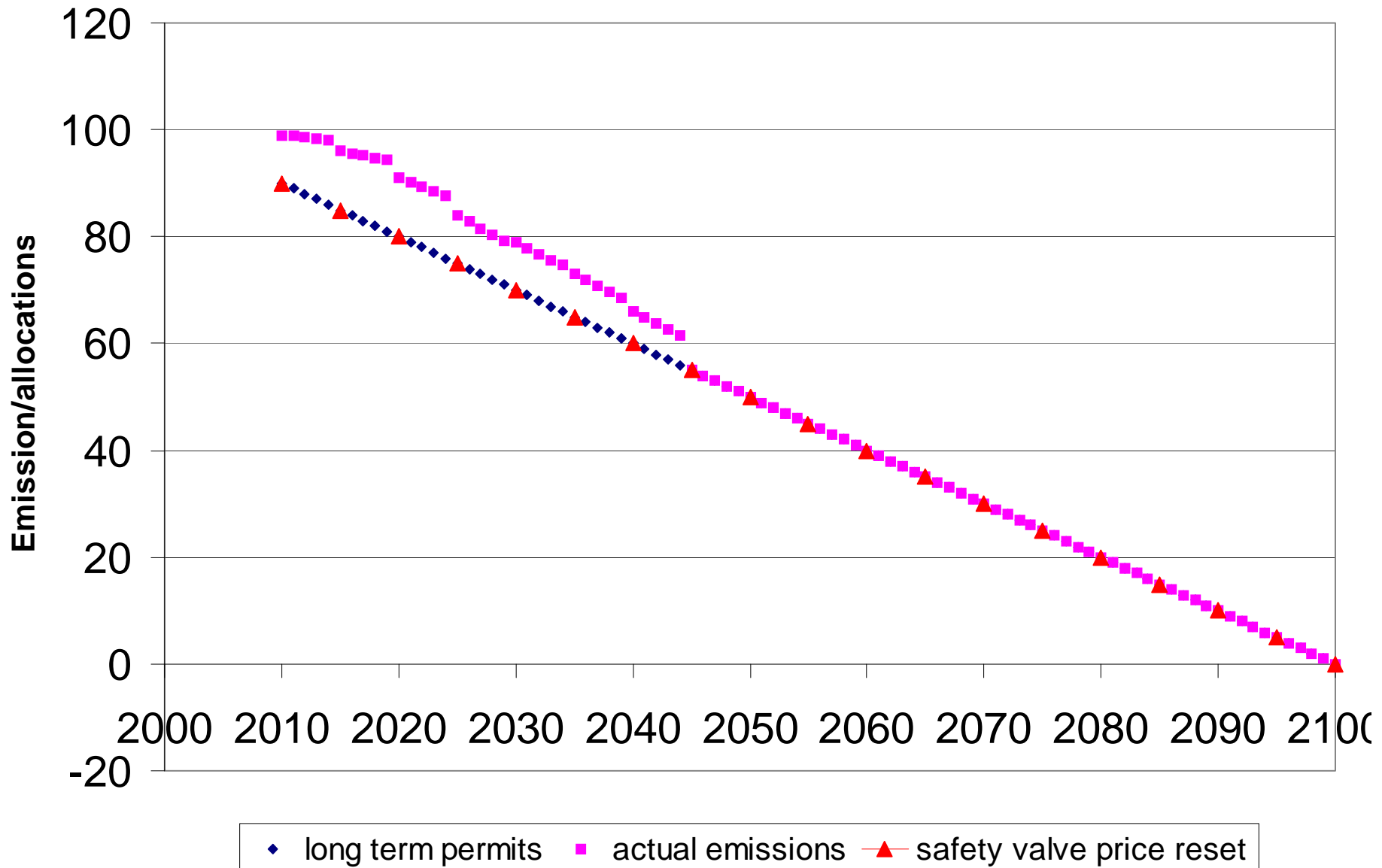


Fig 3: Annual permit Sales - Australia

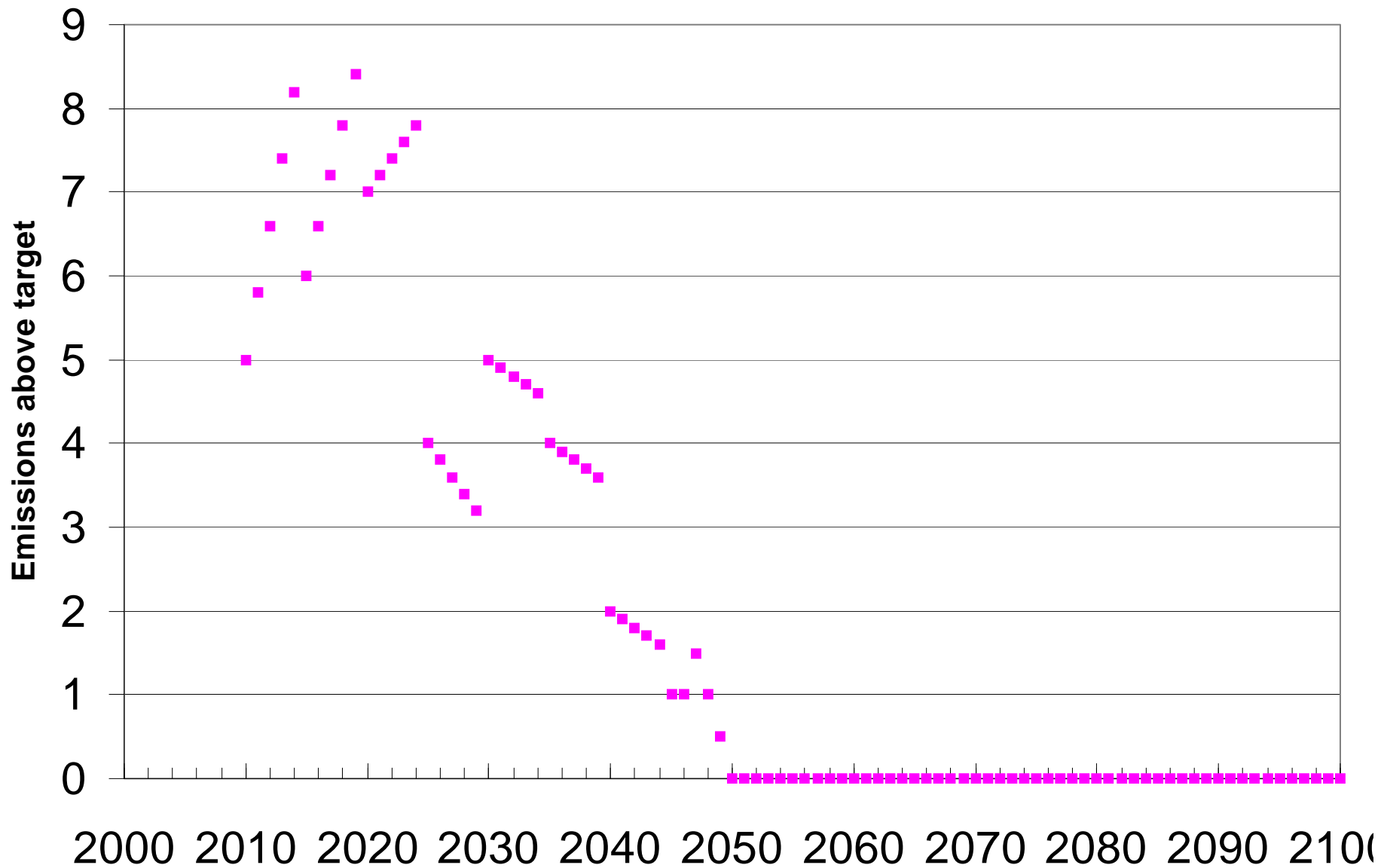


Figure 3 : Annual Permit Price

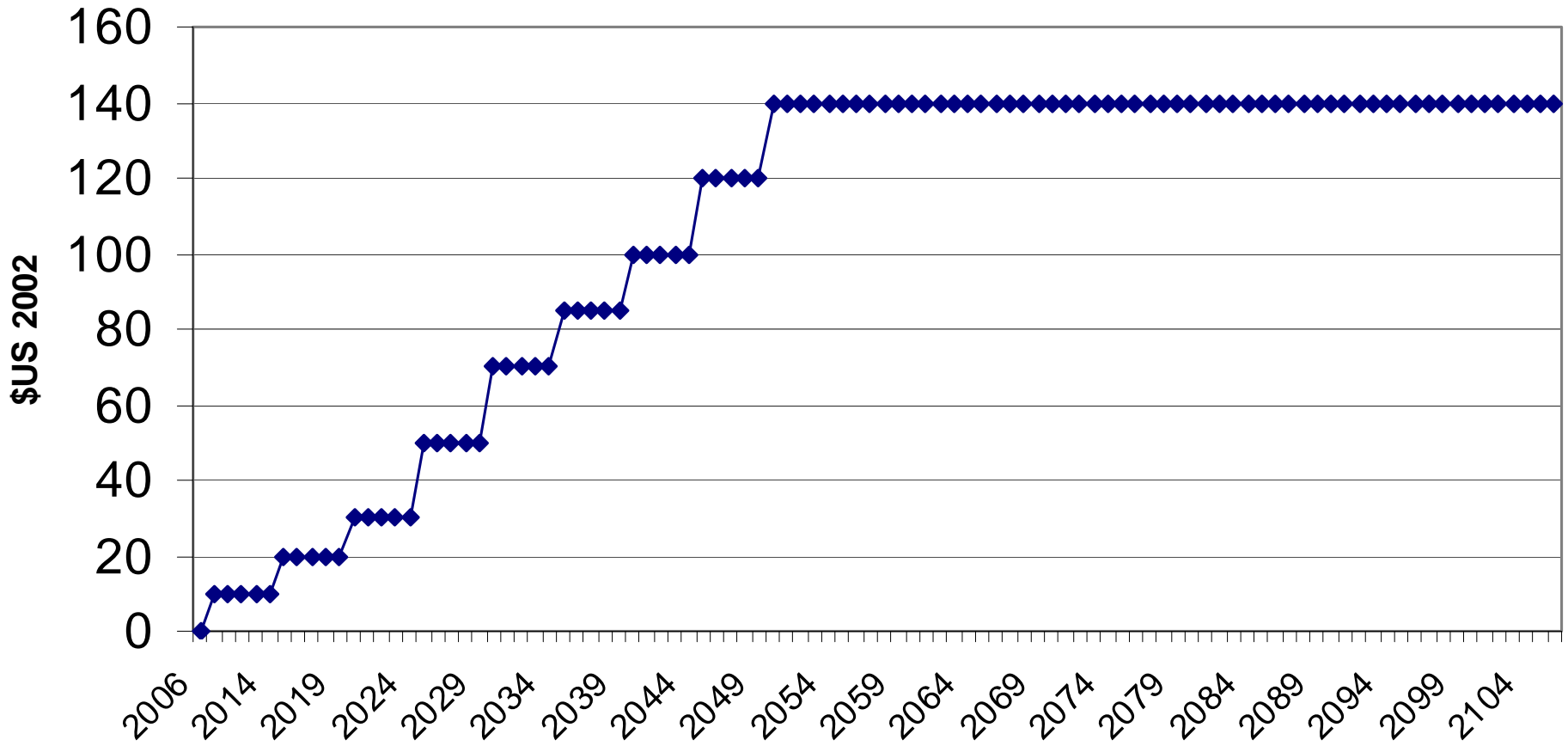
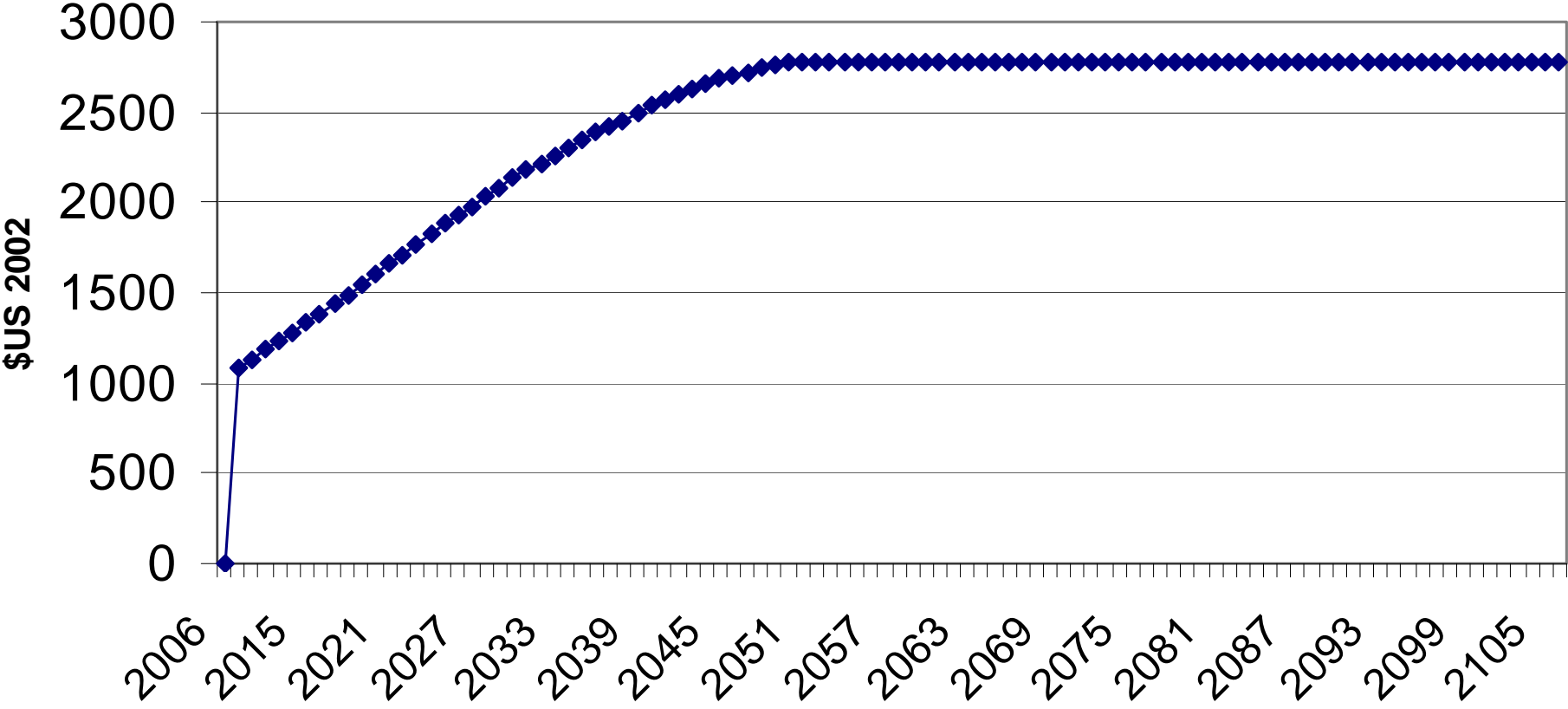


Figure 4 : Stylized Value of Long Term Permits
(Assuming $r=5\%$)





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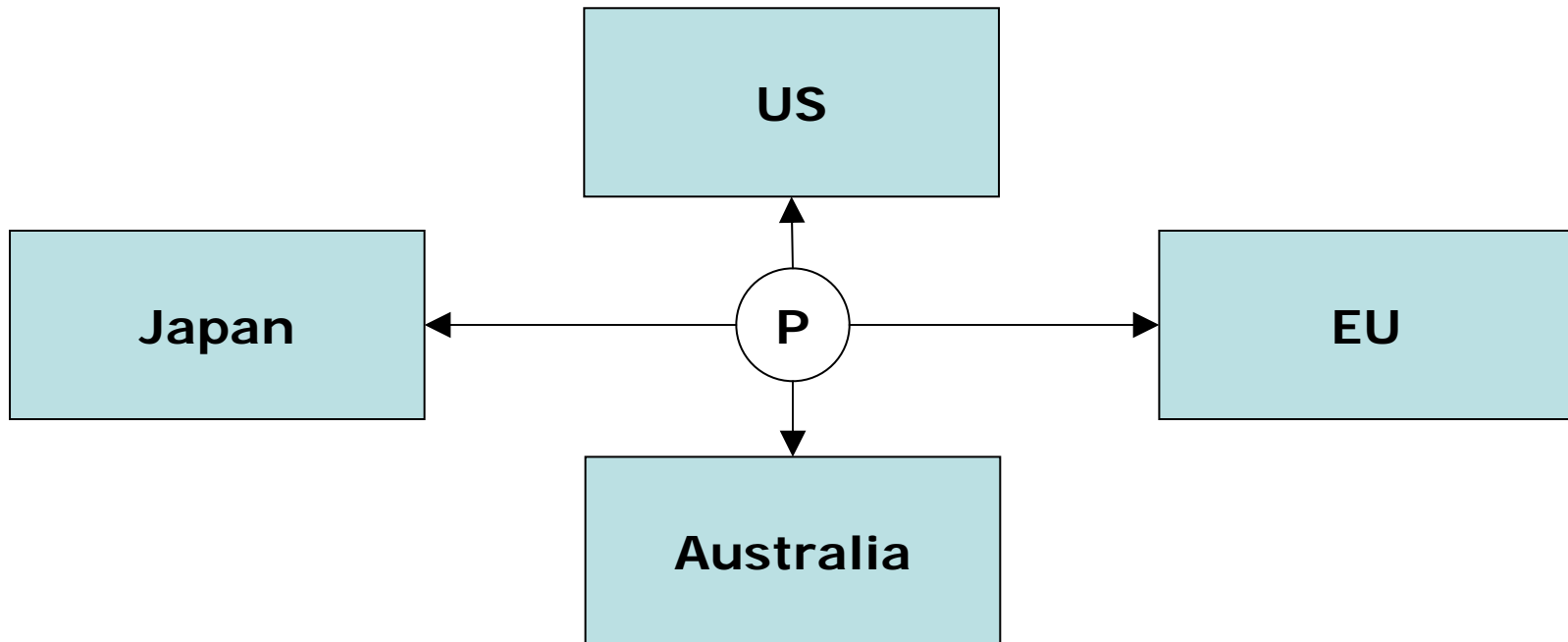
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Coordination of National Markets



- Independent but coordinated via fixed annual carbon price (P)



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Lessons from Kyoto Experience

- A system of rigid targets and timetables is difficult to negotiate because it is a zero sum game
- It is problematic for countries to commit to a rigid target for emissions under uncertainty about costs
- Even the most dedicated countries may be unable to meet their targets due to unforeseen events out of their control



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A Reality Check on the Global Debate

- Countries will develop their own systems
- There will never be a global market for permits because permits are like money – they are the promise of a government to hit an emission target



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Conclusions

- Dealing with climate change uncertainty will be a major change to the Australian and global economy
- Still a great deal unresolved about where the world is heading



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Conclusions

- Australia must create a system that
 - Encourages long term investment in carbon reduction and adaptation
 - Enables long term risk management of climate uncertainty
 - Is flexible enough to evolve as the global system evolves and as we get more information on the global climate.



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Conclusions

- For any policy to survive it is critical to get the balance between long run environmental issues and short run economic costs right.
- Flexibility, credibility and sustainability of the policy framework are key



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