

What does the Government's Modelling Tell Us? Transnational and Regional Impacts of the Government's Climate Change Policy

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“The same modelling results reported differently can convey different impressions to non-experts.”

- Commonwealth of Australia
(2008), Australia's Low Pollution
Future, (“ALPF”) page 21

Outline

1. The Government's Policy versus the Government's Modelling
2. What Didn't the Government Model?
3. Regional Costs and Transnational Costs
4. Conclusions

What is the Government's Policy?

- *“An unconditional commitment to reduce carbon pollution by 5 per cent by 2020; and*
- *A commitment to reduce carbon pollution by 15 per cent by 2020 if there is an agreement where major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's.” (White Paper)*

AND

- *“Reduce Australia's carbon pollution by 25 per cent below 2000 levels by 2020 if the world agrees to an ambitious global deal to stabilise levels of CO₂ equivalent at 450 parts per million or lower.” (4 May Press Release)*

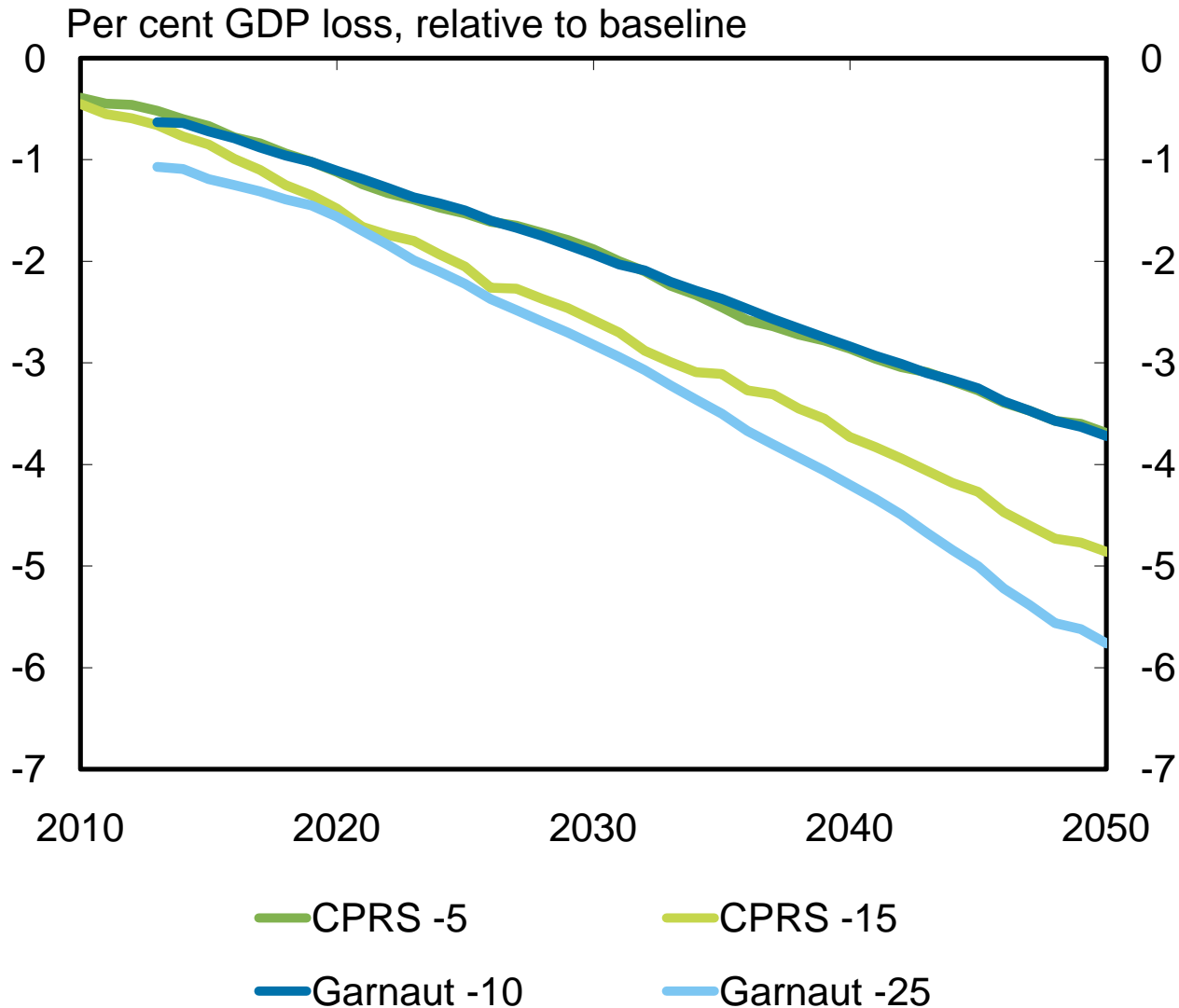
What Did The Government Model?

- CPRS 5 and CPRS 15
 - 5 per cent and 15 per cent reduction in emissions on 2000 levels by 2020, 60 per cent by 2050.
 - Participants (Annex B countries in 2010, China in 2015, India in 2020) are assumed to have similar emissions trading scheme policy settings to Australia.

What Did The Government Model?

- “Garnaut 10”
 - 10 per cent reduction in emissions on 2000 levels by 2020, 80 per cent by 2050.
- “Garnaut 25”
 - 25 per cent reduction in emissions on 2000 levels by 2020, 90 per cent by 2050
- In the Garnaut scenarios, all economies are assumed to adopt targets and participate in international emissions trading from 2013.

Aggregate Costs



Net Present Value of GDP Costs to 2050

NPV of CPRS GDP Costs (\$bn)

Discount Rate	CPRS-5	CPRS-15	Garnaut -10	Garnaut -25	Transfers?
0.0%	1,881	2,472	1,857	2,794	570.55
0.5%	1,627	2,139	1,605	2,414	506.94
1.0%	1,412	1,857	1,392	2,091	452.20
1.4%	1,264	1,661	1,244	1,868	413.85
1.5%	1,230	1,616	1,210	1,817	404.94
2.0%	1,074	1,412	1,055	1,583	364.04
2.5%	941	1,237	922	1,384	328.52
2.70%	893	1,174	875	1,312	315.64
3.0%	827	1,087	809	1,213	297.59
3.5%	729	958	712	1,067	270.58
4.0%	644	847	628	941	246.92
4.5%	572	751	556	832	226.13
5.0%	509	669	493	739	207.81

What Didn't the Government Model?

- Quick version: they haven't model their actual policy.
- No modelling of a unilateral 5 per cent cut.
- No modelling of the effects of delaying the scheme by one year.
- In the Garnaut scenarios, **the government assumes that the expanded Renewable Energy Target (RET) ceases** when emissions trading starts (page 86 of ALPF)
- CPRS scenarios include the expanded RET.

What Didn't the Government Model?

- Permit price? **No.** The government's modelling **assumes** that the CO₂ permit price will grow at a rate of 4 per cent per year in real terms.
- On the other hand, the government's White Paper assumed that the permit price (which is capped in the first five years of the scheme) will grow at a rate of 5 per cent per year in real terms.

What Didn't the Government Model?

- Transitional Costs? **No.**
- Unemployment? **No.** The word “unemployment” is mentioned twice in the government’s modelling.
- Inflation? **No.** Only the government’s best guess of the initial price effect in the first year of the scheme has been published.
- Interest rates? **No.**

Costs of Delay?

- There has been no modelling of the effects of Australia delaying.
- The government analysed the costs of delaying a global ETS by seven years (why this period is chosen is unclear).
- The thought experiment is that the entire world (not just Australia) delays an ETS by seven years and then implements an ETS that tries to achieve the same targets by the same dates.
 - There is **NO** modelling of the consequences to Australia of either the rest of the world delaying its ETS, or of Australia delaying its ETS.
 - There is **NO** modelling of the consequences of implementing a poorly designed ETS earlier, versus a better designed ETS later.
 - Thus, the key economic issues relating to delay are completely ignored.

Carbon Leakage? No

- Carbon leakage is not an issue, because it is basically assumed away.
- In the Garnaut scenarios there is no carbon leakage because all countries face the same world price immediately.
- In the CPRS scenarios China is assumed to face the world emissions price by 2015, so any leakage is by definition minimal – the net present value of the additional profit that could be gained by a company moving to China between 2010 and 2015 would be quite small, given that permit prices are assumed to equalise in 2015.

Other Critical Assumptions: CCS

- In all policy scenarios, carbon capture and storage (CCS) begins to be commercially adopted between 2020 and 2025 (when the real permit price is around \$40-\$65 depending on the scenario), everywhere around the world.

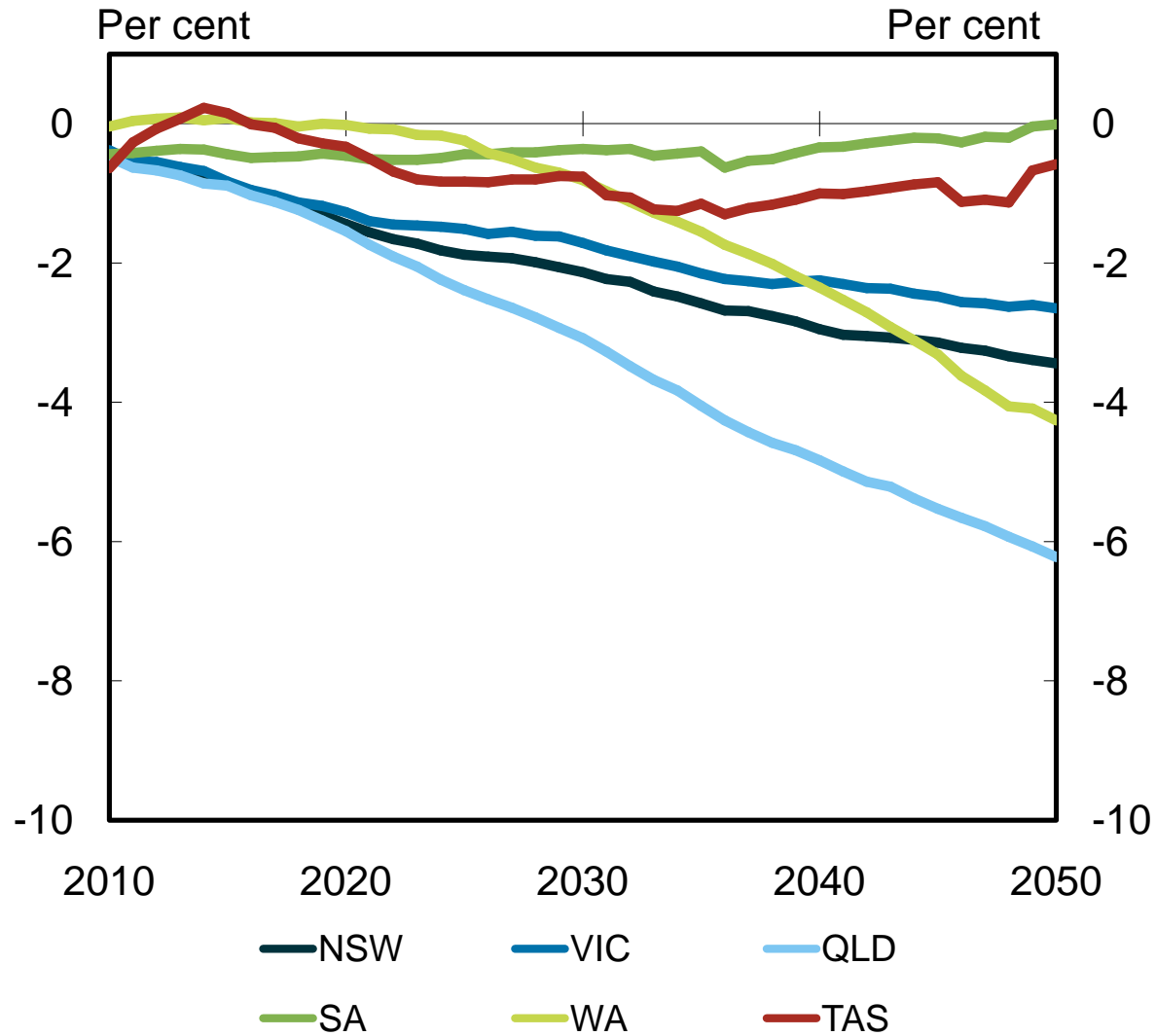
Other Critical Assumptions: Revenue Recycling

- In all scenarios, the government assumes that permit revenue is returned to households in a non-distortionary fashion.
 - To the extent that compensation to households will be distortionary or exacerbate existing distortions (i.e. higher effective marginal tax rates), this assumption means that the government will have underestimated the welfare costs of the ETS.

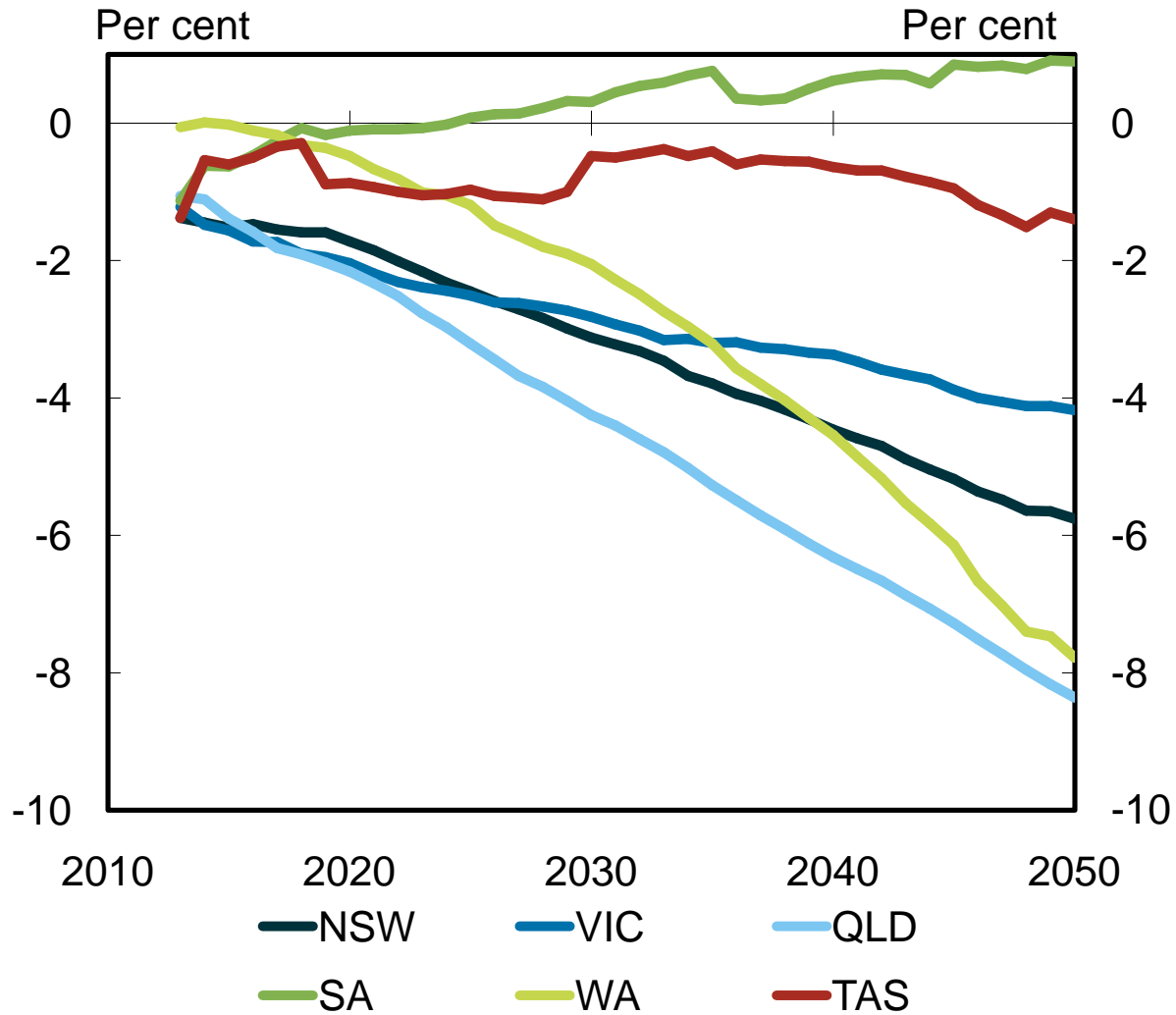
Regional Impacts?

- State effects: Queensland is most affected under all scenarios. Its gross state product (GSP) is projected to decline by between 6 and 8 per cent relative to the reference scenario because of its reliance on coal-fired electricity, coal mining production, and aluminium production (p 160).
- Western Australia is the next most affected state, because of its reliance on gas.
- South Australia does relatively well due to forestry.

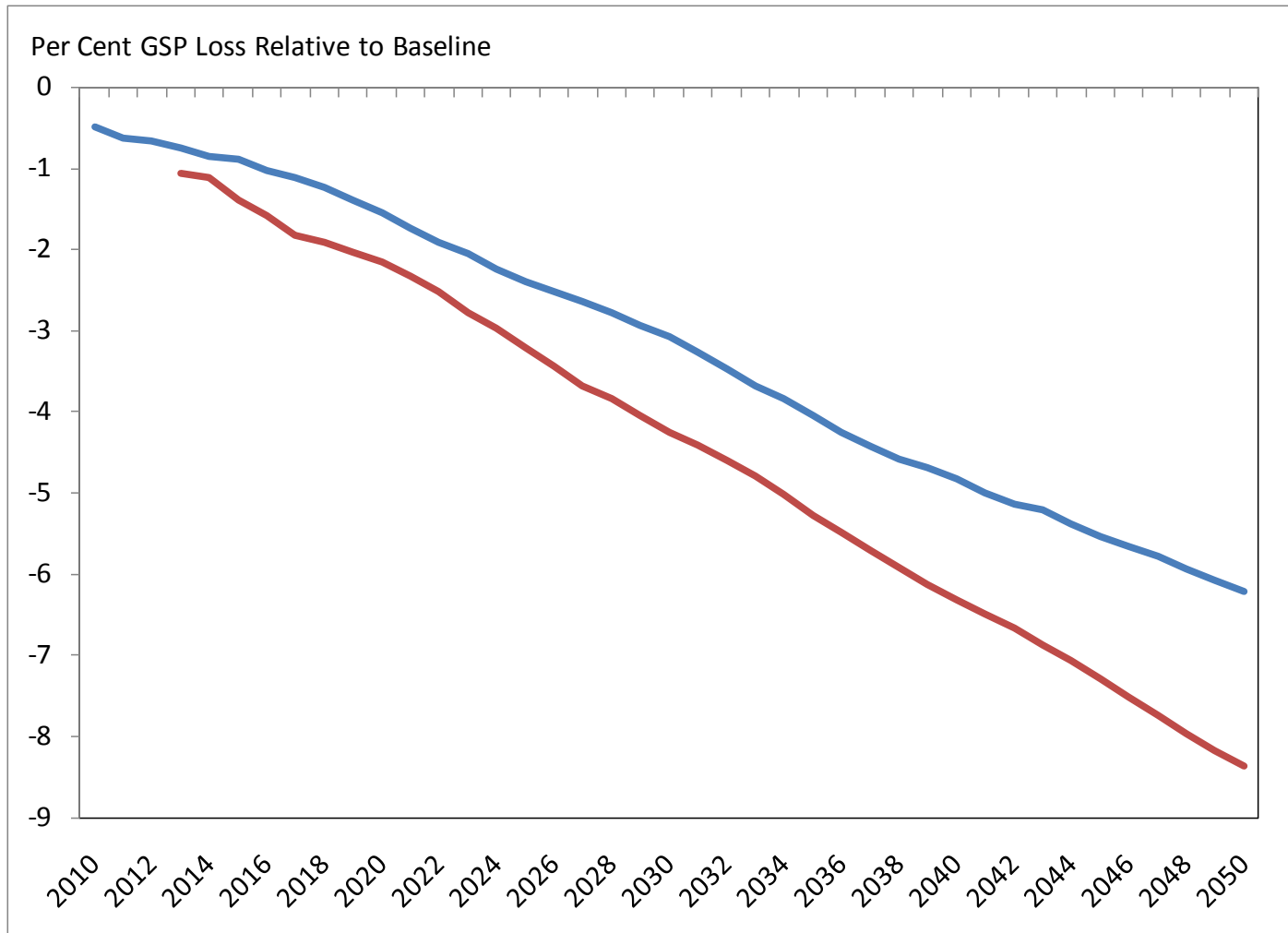
CPRS 5



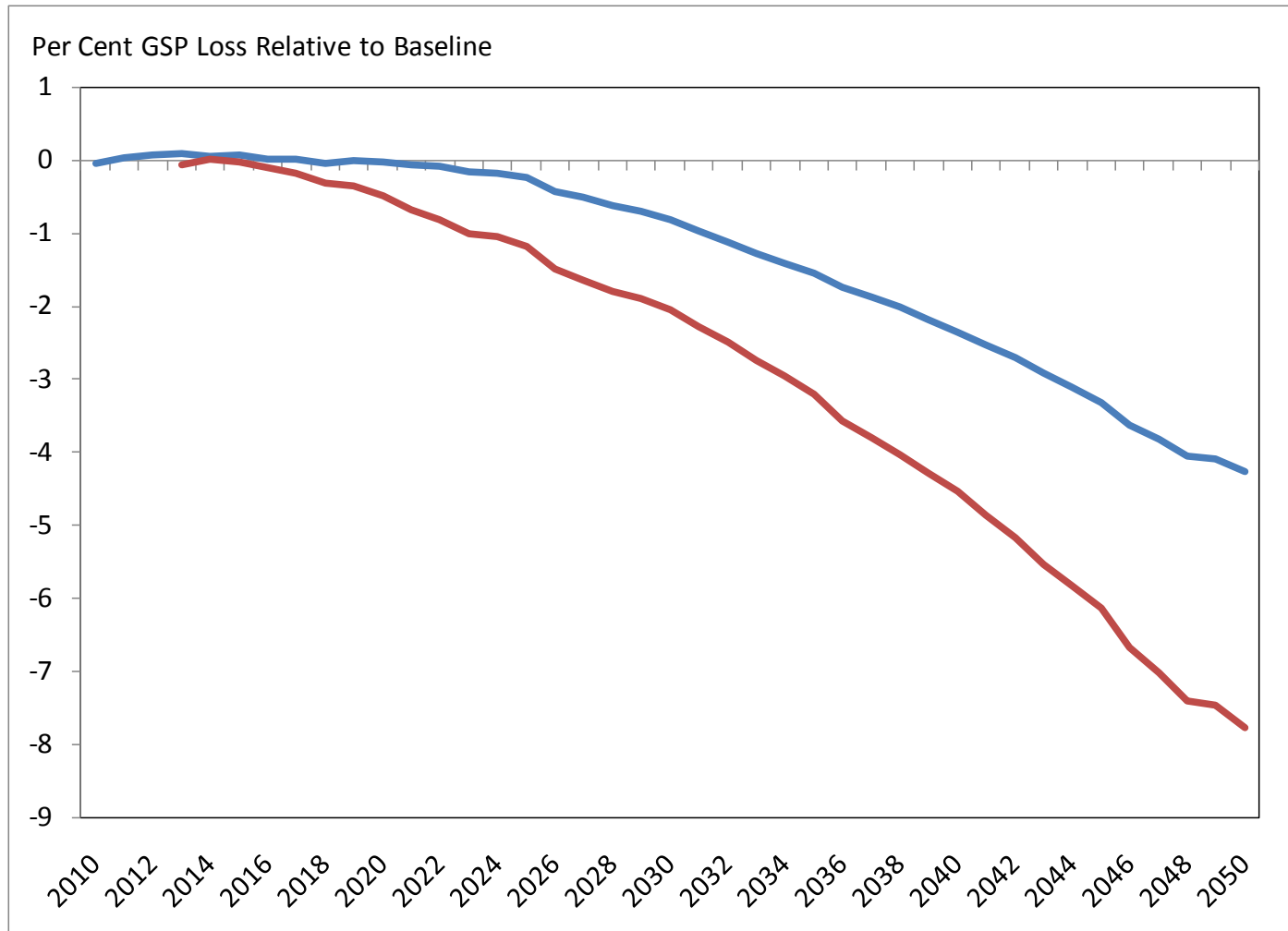
Garnaut 25



QLD: CPRS 5 and Garnaut 25



WA: CPRS 5 and Garnaut 25



Electricity Prices?

**Table 6.14: Average wholesale electricity price increase
Change from reference scenario**

	CPRS -5			CPRS -15			Garnaut -10			Garnaut -25		
	2010-15	2015-20	2045-50	2010-15	2015-20	2045-50	2013-15	2015-20	2045-50	2013-15	2015-20	2045-50
	Per cent			Per cent			Per cent			Per cent		
NSW	65	108	128	69	111	185	93	106	156	145	170	199
VIC	57	120	144	56	121	201	87	113	133	157	197	225
QLD	66	109	159	73	107	192	116	112	190	194	195	218
SA	50	72	62	49	69	116	83	85	83	125	126	104
TAS	40	96	74	44	102	112	76	91	70	144	166	127
SWIS	22	37	104	22	31	118	26	40	100	52	71	143
NT	10	10	27	14	15	39	6	10	36	17	24	84
Avg	48	86	122	48	84	164	75	86	134	126	146	186

Note: SWIS is the South-West Interconnected System in Western Australia. Projected increases in 2010-15 in the CPRS scenarios are muted by a projected spike in reference scenario prices early in that period. Values shown are averages across each period.

Source: MMA.

Electricity Prices?

**Table 6.15: Average household electricity price increases
Change from reference scenario**

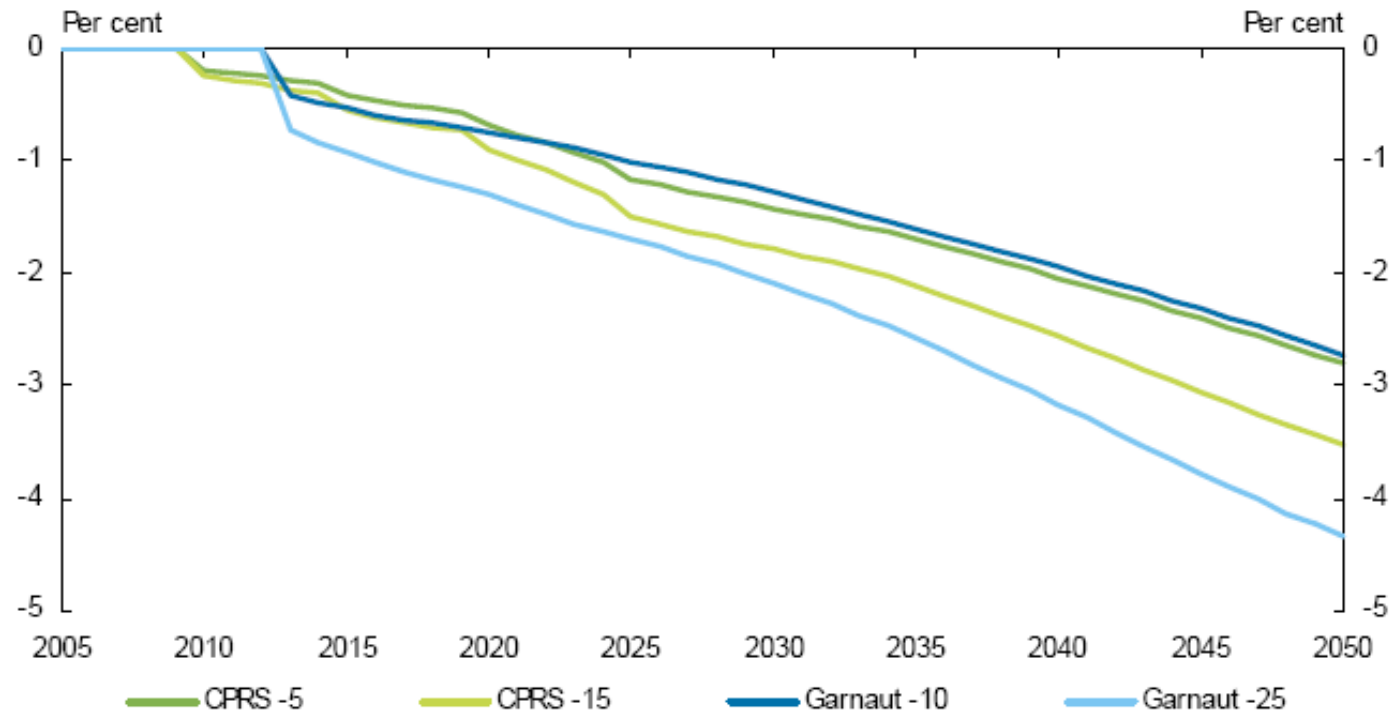
	CPRS -5			CPRS-15			Garnaut -10			Garnaut -25		
	2010-15	2015-20	2045-50	2010-15	2015-20	2045-50	2013-15	2015-20	2045-50	2013-15	2015-20	2045-50
	Per cent			Per cent			Per cent			Per cent		
NSW	23	27	33	25	29	48	25	24	41	38	39	52
VIC	23	30	37	23	31	52	25	26	35	44	46	59
QLD	21	25	37	24	26	45	26	24	44	44	41	51
SA	21	22	20	21	22	38	26	23	27	39	35	34
TAS	16	25	22	18	27	33	21	21	21	40	39	38
SWIS	11	14	34	12	13	39	10	13	33	20	23	47
NT	5	5	12	7	7	17	3	5	16	9	11	37
Avg	20	25	34	22	26	46	23	23	38	38	38	51

Note: SWIS is the South-West Interconnected System in Western Australia. The modelling assumes that wholesale price increases are passed through into retail prices. Values shown are averages across each period.

Source: MMA.

World GDP

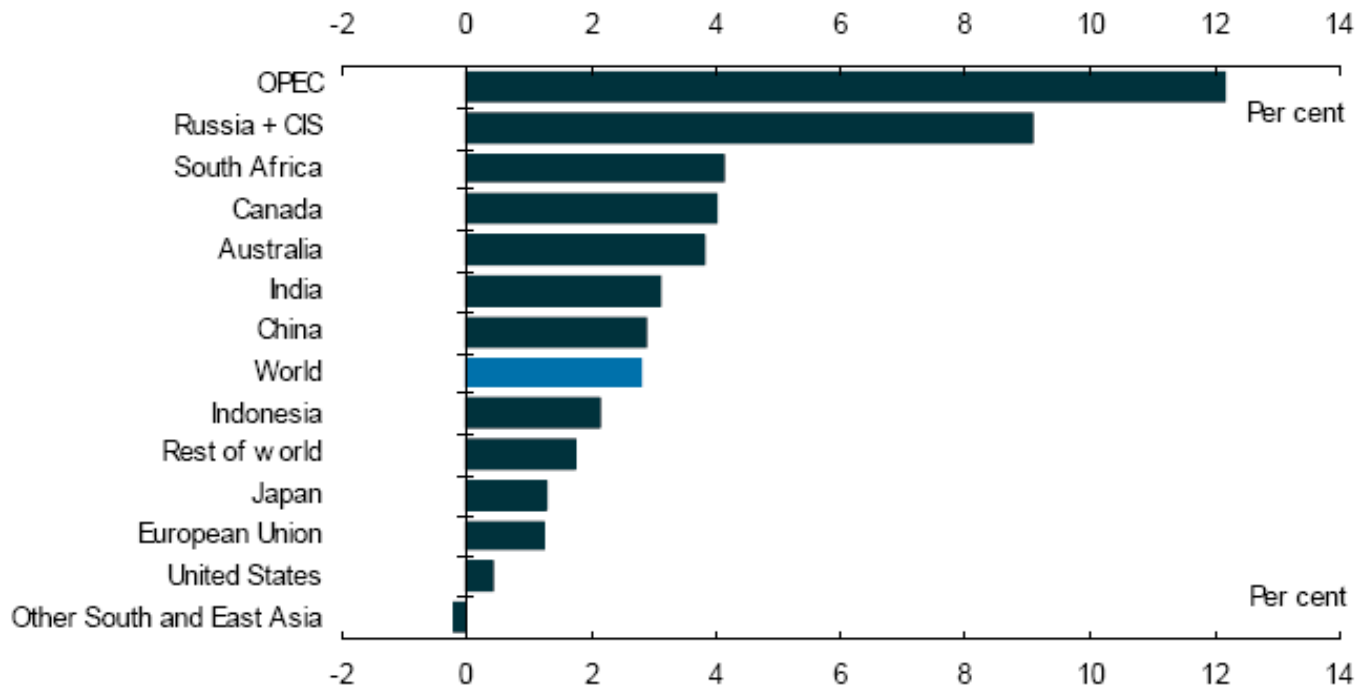
Chart 5.6: GTEM: Gross world product
Change from reference scenario



Source: Treasury estimates from GTEM.

Transnational Costs

Chart 5.11: GNP mitigation costs across regions
Change from reference scenario, CPRS -5 scenario in 2050



Source: Treasury estimates from GTEM.

Transnational Costs

Table 5.14: Regional GDP costs
Change from reference scenario, GTEM

	2020				2050			
	CPRS	CPRS	Garnaut	Garnaut	CPRS	CPRS	Garnaut	Garnaut
	-5	-15	-10	-25	-5	-15	-10	-25
	Per cent				Per cent			
United States	-0.2	-0.3	0.0	-0.1	-0.3	-0.3	-0.6	-0.7
EU-25	-0.2	-0.2	0.1	0.1	-0.3	-0.4	-0.5	-1.0
China	-1.6	-2.1	-1.7	-3.0	-2.8	-3.7	-3.1	-5.1
Russia + CIS(a)	-3.1	-4.4	-3.3	-5.7	-9.7	-12.8	-9.9	-15.5
Japan	0.1	0.1	0.3	0.4	0.4	0.3	0.2	0.0
India	-0.7	-0.7	-1.4	-2.4	-4.6	-5.2	-4.2	-5.8
Canada	-0.5	-0.8	-0.4	-0.7	-2.3	-3.1	-2.7	-4.5
Australia	-0.9	-1.2	-0.8	-1.4	-2.9	-3.5	-3.2	-4.6
Indonesia	-1.0	-1.2	-2.0	-3.6	-3.7	-4.6	-2.6	-4.9
South Africa	-1.5	-2.1	-1.6	-2.8	-5.4	-6.5	-5.7	-8.0
Other South and East Asia	-0.3	-0.3	-0.2	-0.4	-2.1	-2.6	-1.6	-2.6
OPEC	-1.9	-2.6	-1.9	-3.4	-8.2	-11.4	-8.6	-14.4
Rest of world	-0.2	-0.1	-0.4	-0.7	-2.4	-2.9	-2.0	-3.3
World	-0.7	-0.9	-0.7	-1.3	-2.8	-3.5	-2.7	-4.3

Transnational Costs

Change from reference scenario, G-Cubed

	2020				2050			
	CPRS	CPRS	Garnaut	Garnaut	CPRS	CPRS	Garnaut	Garnaut
	-5	-15	-10	-25	-5	-15	-10	-25
	Per cent				Per cent			
United States	-1.0	-1.2	-1.0	-1.4	-1.4	-1.3	-1.8	-1.8
Japan	-0.9	-1.1	-0.6	-0.9	-2.9	-3.1	-3.0	-3.1
Australia	-2.2	-2.8	-1.8	-2.6	-5.3	-6.3	-3.9	-5.5
Europe	-1.4	-1.8	-0.9	-1.3	-3.5	-4.2	-2.8	-4.2
Other OECD	-2.7	-3.3	-2.2	-3.2	-7.0	-7.6	-5.3	-5.8
China	-4.8	-5.5	-3.3	-4.6	-1.6	-1.4	-2.8	-2.3
Rest of world	-0.8	-1.0	-2.1	-3.1	-3.2	-3.8	-2.3	-3.4
Former Soviet Union	-1.9	-2.3	-1.3	-2.0	-5.3	-6.4	-3.7	-5.4
OPEC	-10.5	-12.6	-9.1	-13.5	-9.1	-10.6	-11.3	-16.2
World	-2.3	-2.8	-2.2	-3.3	-3.3	-3.8	-3.2	-4.2

Note: (a) Commonwealth of Independent States.

Source: Treasury estimates from GTEM and G-Cubed.

Conclusions

- The government has not modelled the actual policy it plans to put in place.
- The modelling fails to show that the CPRS would pass a cost benefit test for Australia
- Modelling results rely on a number of unrealistic assumptions.
- The government has not modelled crucial aspects of the effects of its policy, including possible effects on unemployment, inflation, interest rates, and the distributional (regressive) effects on households over the medium to long term.

Conclusions (cont)

- The government's modelling suggests that it believes that Qld and WA will be hardest hit (relative to baseline) by the CPRS, although the full regional effects have not been analysed or published by the government.