
Greenhouse-intensive water heater phase-out: Consultation RIS

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Summary of consultation RIS

- Policy statements
- GH-intensive water heaters
- The problem of market failure
- 5 projection scenarios
- Projected costs and benefits
- Impacts on income groups
- Impacts on water heater industry & installers
- Recommendations

MCE policy statements

- ‘The framework provides for the reduction of greenhouse gas emissions associated with water heating, through the specification of minimum energy performance standards for water heaters and the **phasing out of conventional electric resistance water heaters** (except where the emissions intensity of the public electricity supply is low)’...
- ‘...individual jurisdictions may opt to bring forward the program including introducing more stringent requirements...’ *National Hot Water Strategic Framework* (MCE 2008)

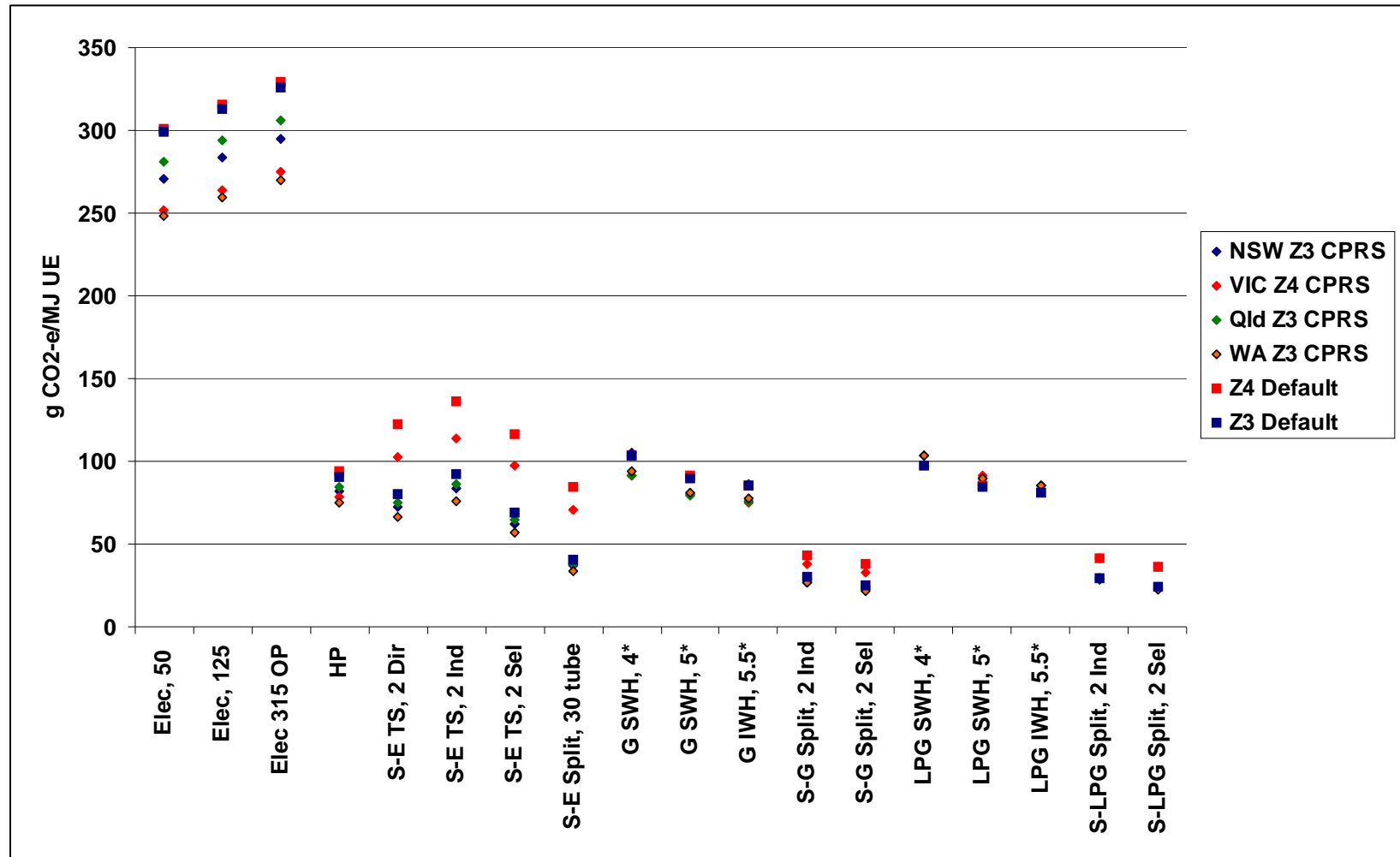
COAG policy statements

- ‘Inefficient and **greenhouse-intensive hot water systems will also be phased-out** through a mix of regulatory measures, incentives and industry development elements...This phase-out will greatly reduce the total electricity used and decrease households’ water heating costs’...*National Strategy on Energy Efficiency* (COAG July 2009).

What is a GH-intensive WH?

- Building Code of Australia has adopted a benchmark of 100 g CO₂-e/MJ hot water
 - » Many assumptions underlying this value
- Excludes: electric storage water heaters
- Allows (as 'deemed to satisfy):
 - » Conventional gas/LPG
 - » Solar-electric
 - » Solar-gas/LPG
 - » Electric heat pump

GH-intensity of water heating



Cost characteristics

Type	Capital cost	Running cost
Electric	Low	Low (OP)–high
Natural gas	Medium	Low
Solar-electric	High	Low
Solar-gas	Highest	Lowest
Heat pump	High	Low
LPG	Medium	High
Solar-LPG	Highest	Medium

Current support for solar/HP

- Renewable Energy Target scheme
 - » Solar and HP create RECs
 - » Cross-subsidy from other electricity users
 - » RET now mandated to 2030
- Government (taxpayer) rebates – to June 2012
 - » CW offering \$1,600 per solar, \$1,000 per HP
 - » Other jurisdictions have different programs

Current rules

	New homes	Existing homes
NSW	Yes (BASIX)	No
Victoria	Yes ('5 star')	No
Qld	Yes	Yes – lower impact
SA	Yes	Yes – higher impact
WA	Yes	No
Tasmania	No	No
NT	No	No
ACT	Yes	No

The problem: Market failures

- Energy accounts for highest share of lifetime ownership cost of any appliance, yet least likely to influence purchase
- WHs subject to classic split incentives
 - » Buyers usually prefer least capital cost (esp. owners of rental property)
 - » Replacements tends to be rushed decisions
 - » High influence of intermediaries
- Cost of WH services higher than ‘ideal’
 - » i.e. if all buyers well informed, no capital constraint

What about CPRS?

- Will not affect capital cost issues
- Could influence some 'engaged' buyers
 - » Every \$10/tonne = 1 c/kWh (OP prices around 8c)
 - » But only 40% 'engaged'
- Will not overcome split incentives problem
 - » Around 60% of purchases
- Have modelled 'CPRS-only' scenario
- Market failures will increase CPRS adjustment costs for entire economy

The proposal

- Legislation in each state to prohibit plumbers & installers installing GH-intensive WH in houses
 - » To take effect end of 2010 in areas with gas
 - » Other areas in 2012 (options: solar, HP, LPG)
 - » Phase 1: own rules, Phase 2: Plumbing Code of Aust.
- General exemption rules
 - » Small electric WHs permitted in some situations
 - » If electricity supply 'low-intensity' (not GreenPower)
- Special exemption rules in each jurisdiction

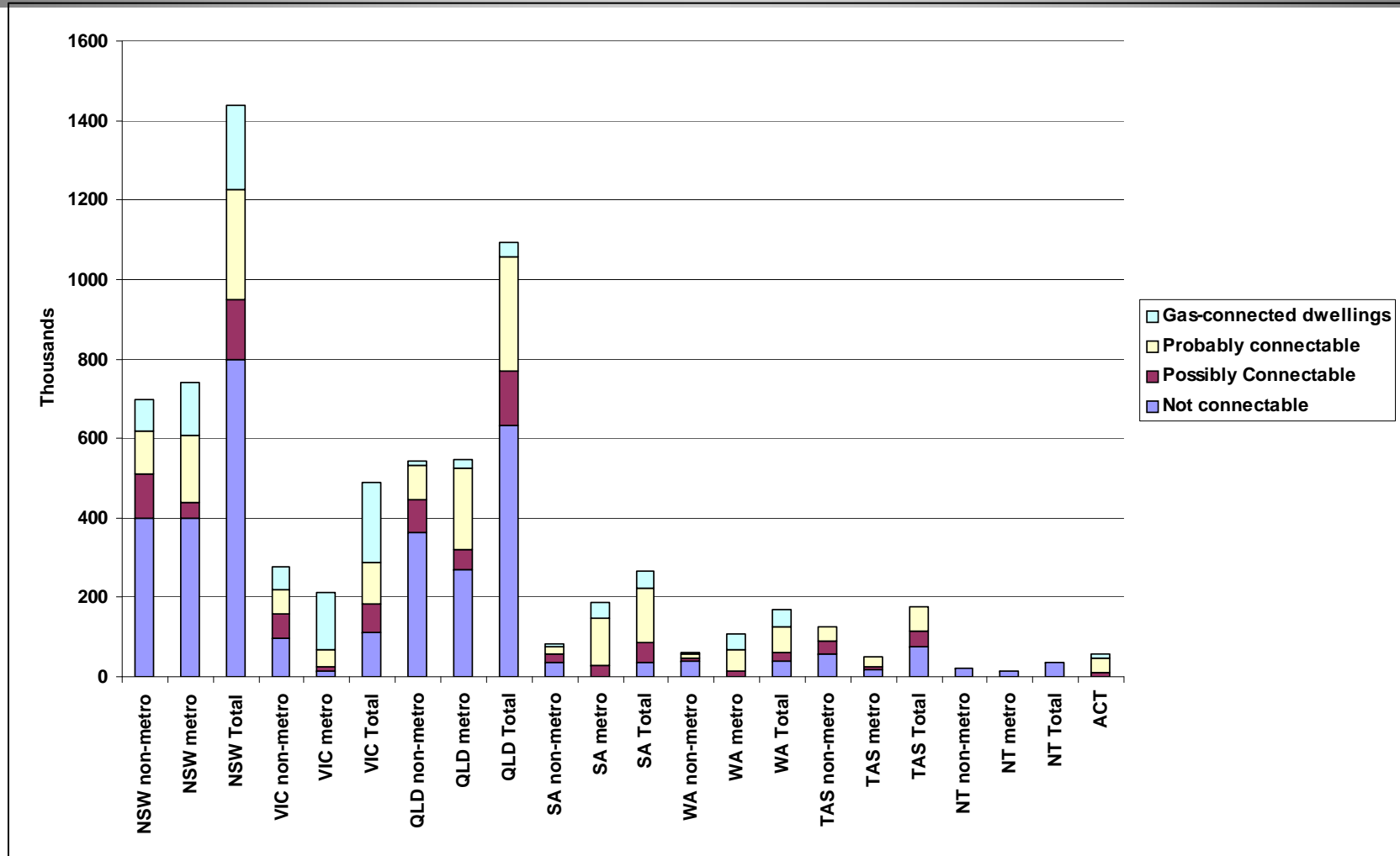
Scenarios modelled

Scenario	Description	Regions/classes	2010, 2011	2012 onward
S0 Ideal	Perfect market – no restrictions	Gas-available	Unrestricted	Unrestricted
		No gas	Unrestricted	Unrestricted
S1 NR	No regulations or purchase restrictions	Gas-available	Unrestricted	Unrestricted
		No gas	Unrestricted	Unrestricted
S2 Rapid	Rapid implementation 2010	Gas-available	No electric	No electric
		No gas	No electric	No electric
S3 Extended	Phased implementation 2010-12	Gas-available	No electric	No electric
		No gas	Unrestricted	No electric
S4 WHIP	Water Heater Industry Proposal	Gas own-occ	No electric	No electric
		No-gas own/occ	Unrestricted	Unrestricted
		Gas rental (a)	No electric	No electric
		No-gas rental	Unrestricted	Renewable only

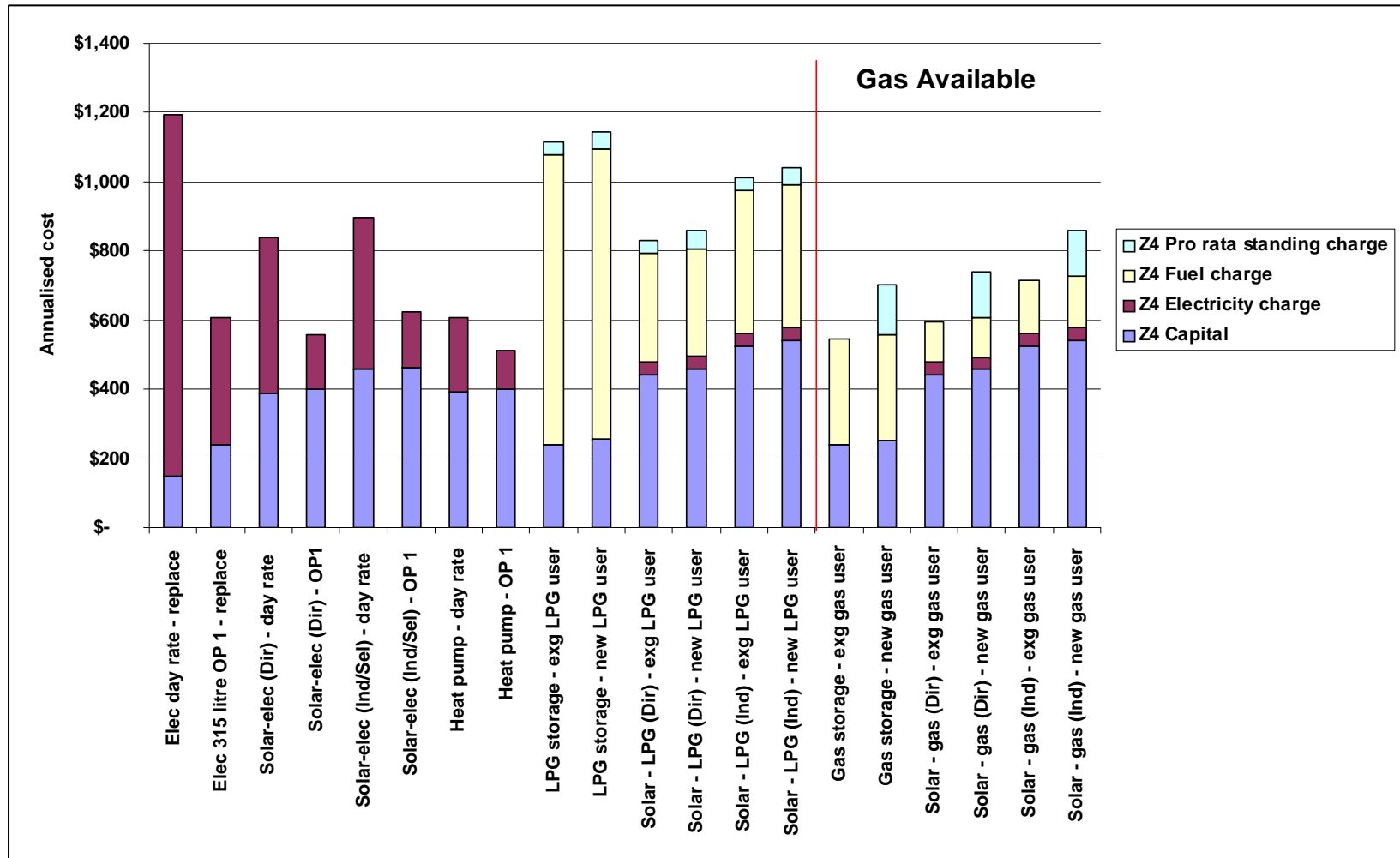
Cost-benefit modelling

- Energy price & GH-intensity projections based on Treasury 2008 CPRS modelling
 - » Each state & territory separately modelled
- Capital costs include RECs but not rebates
- NIEIR modelled household WH choice
 - » Simulated optimal & sub-optimal choice
 - » Range of discount rates (3%,6%,9%)
 - » Actual & perceived gas connection costs
 - » Actual & perceived gas standing charges
- 6 income groups, owners/renters, small/med

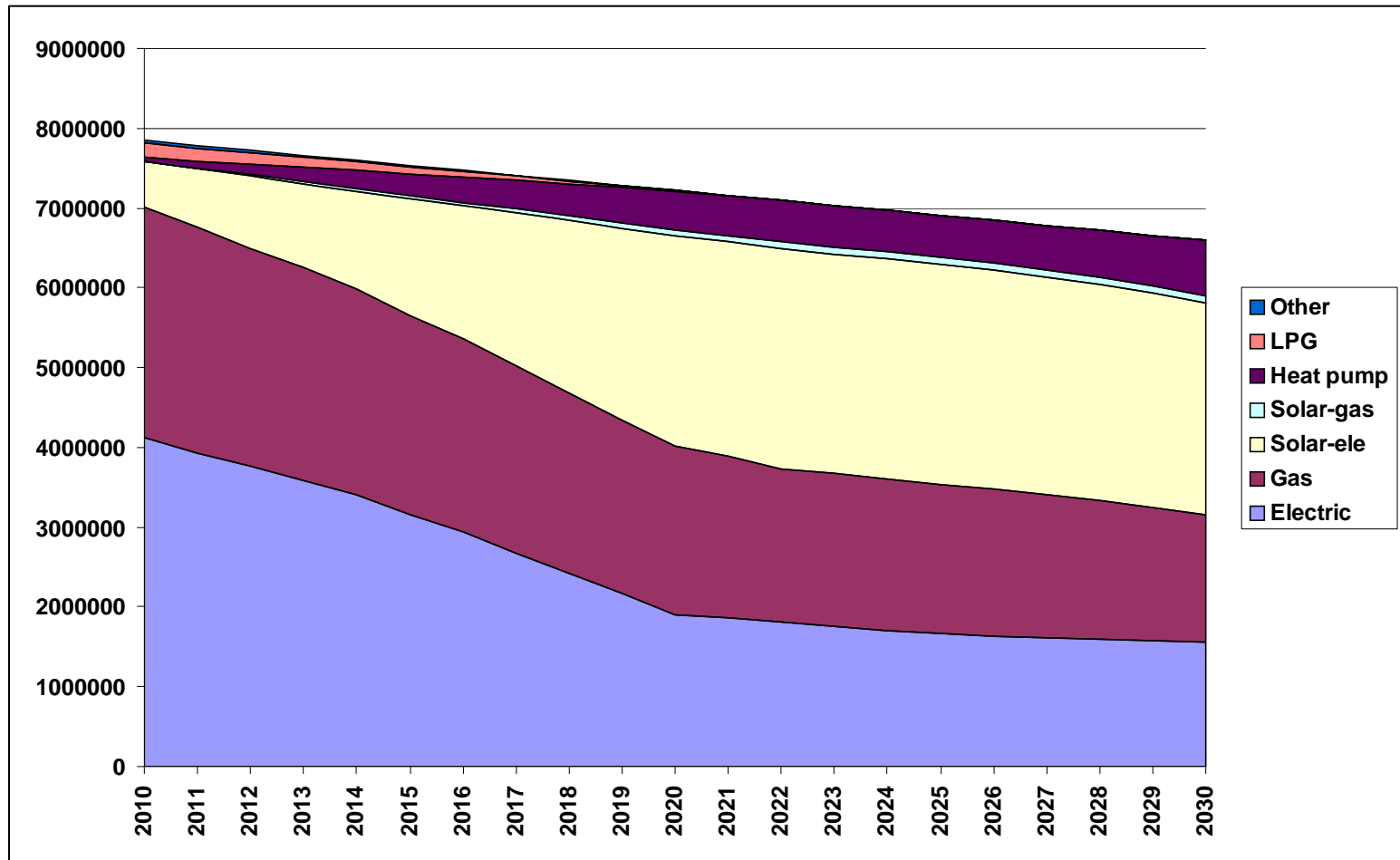
HH with electric WH



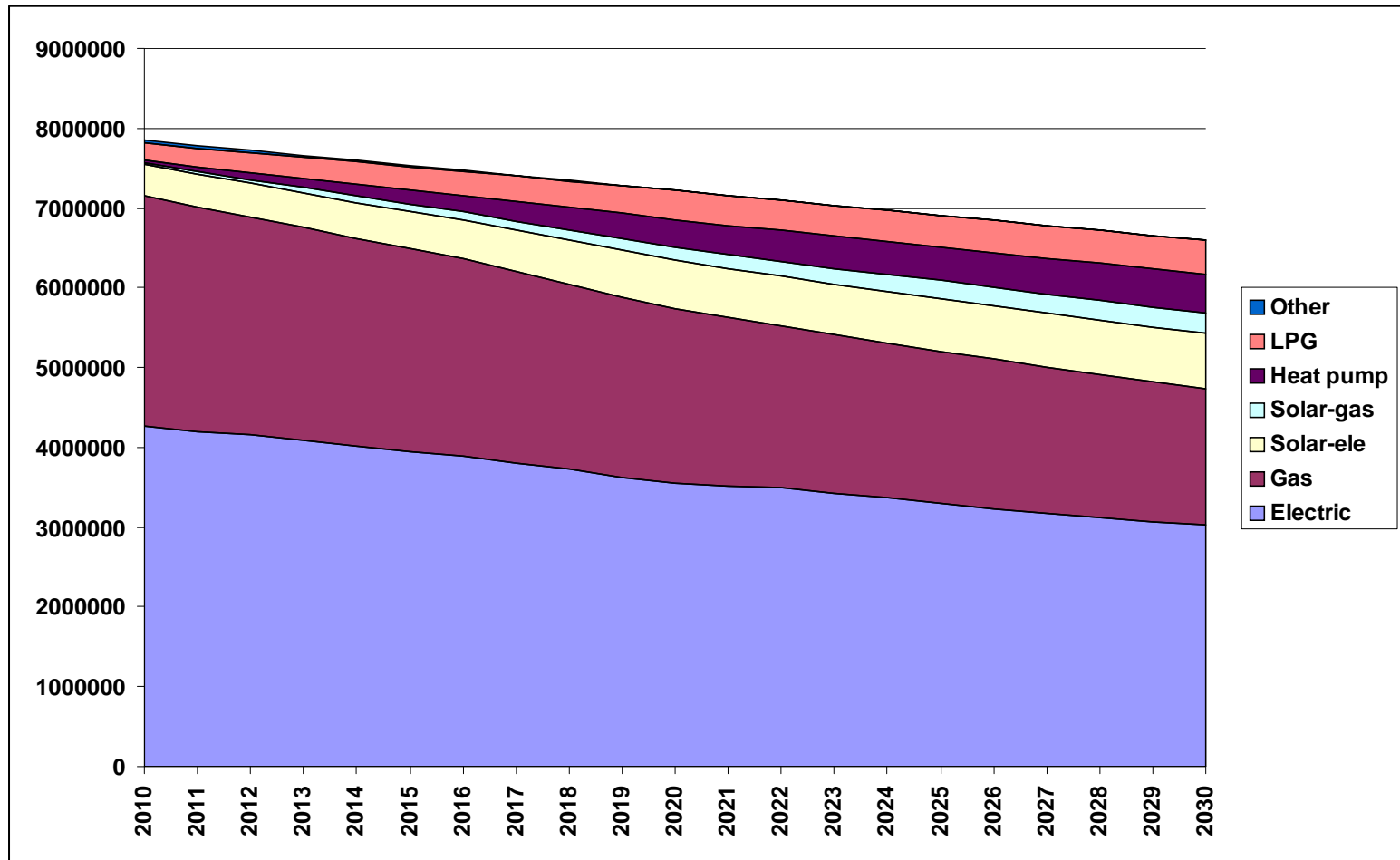
Annualised cost of WH - NSW



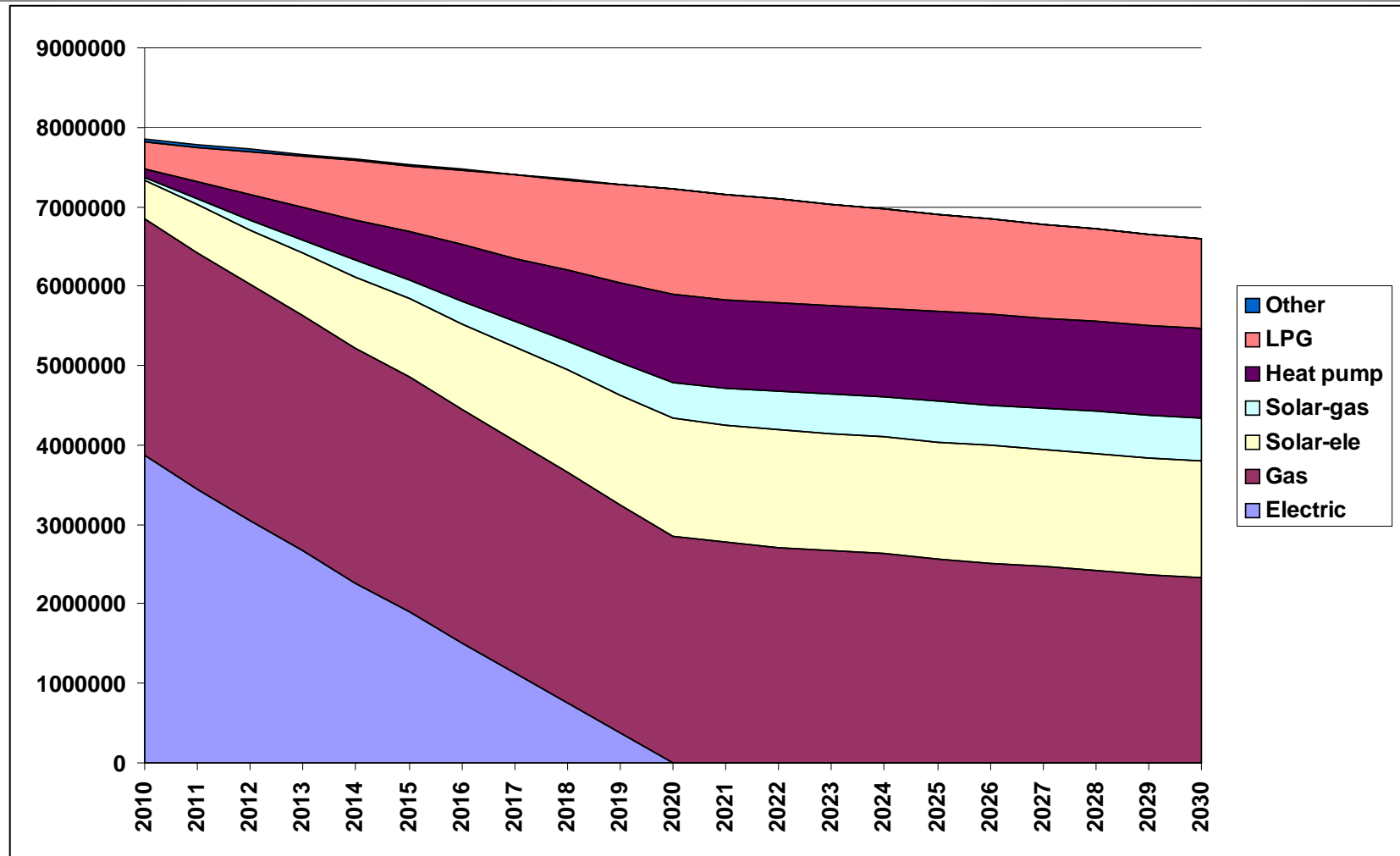
S0 - 'Ideal' case



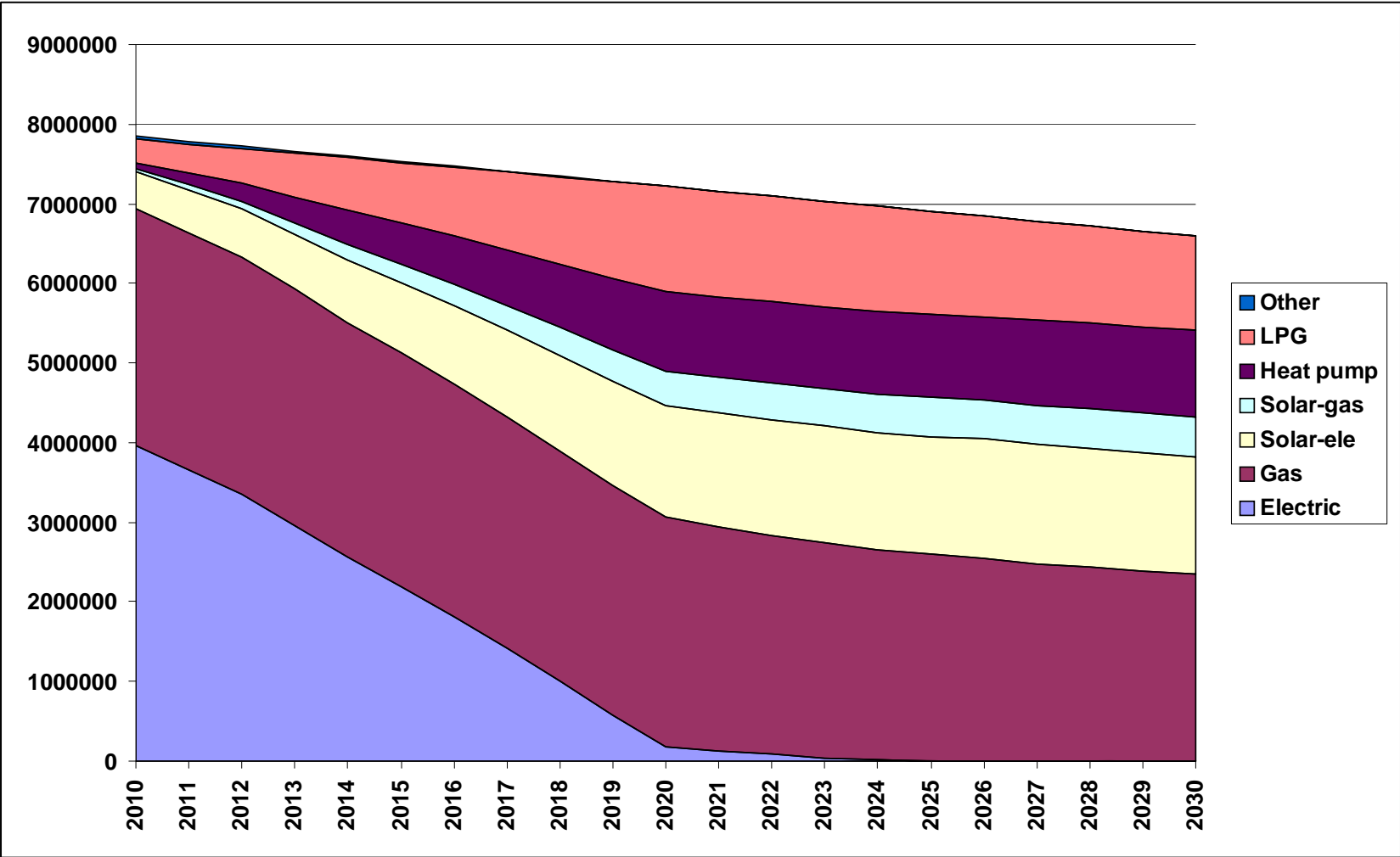
S1 - No regulations



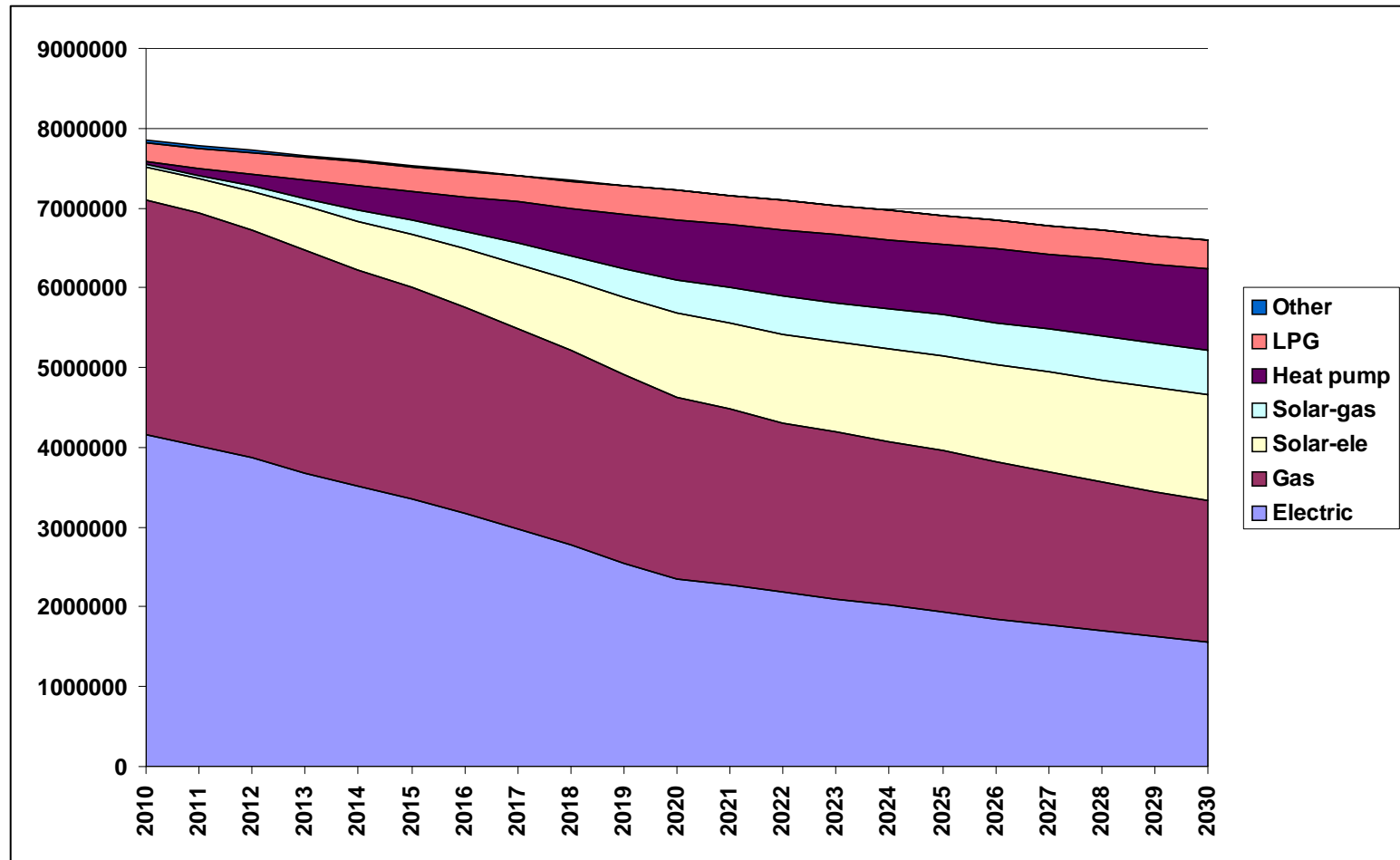
S2 - Rapid phaseout from 2010



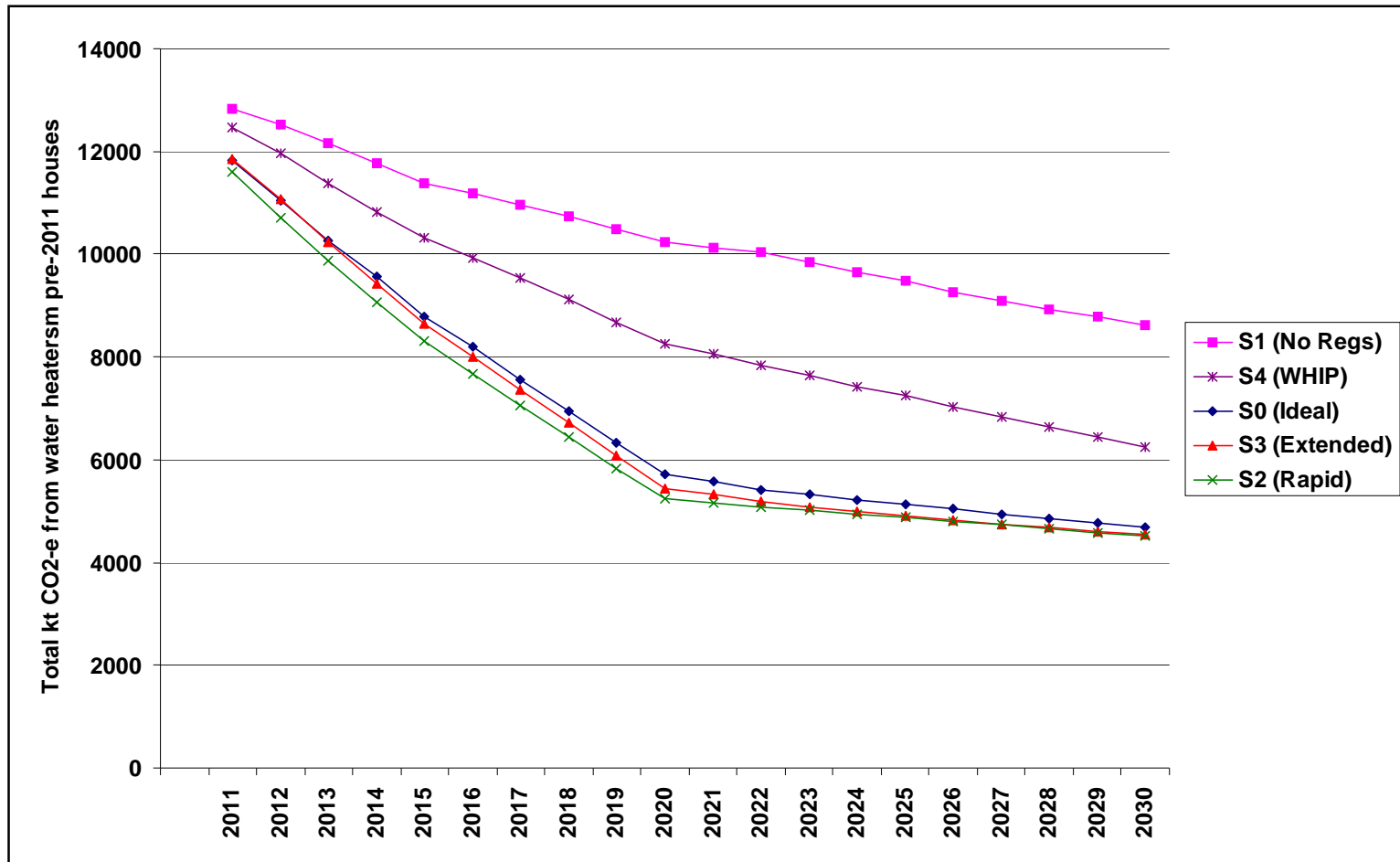
S3 - Phaseout over period 2010-12



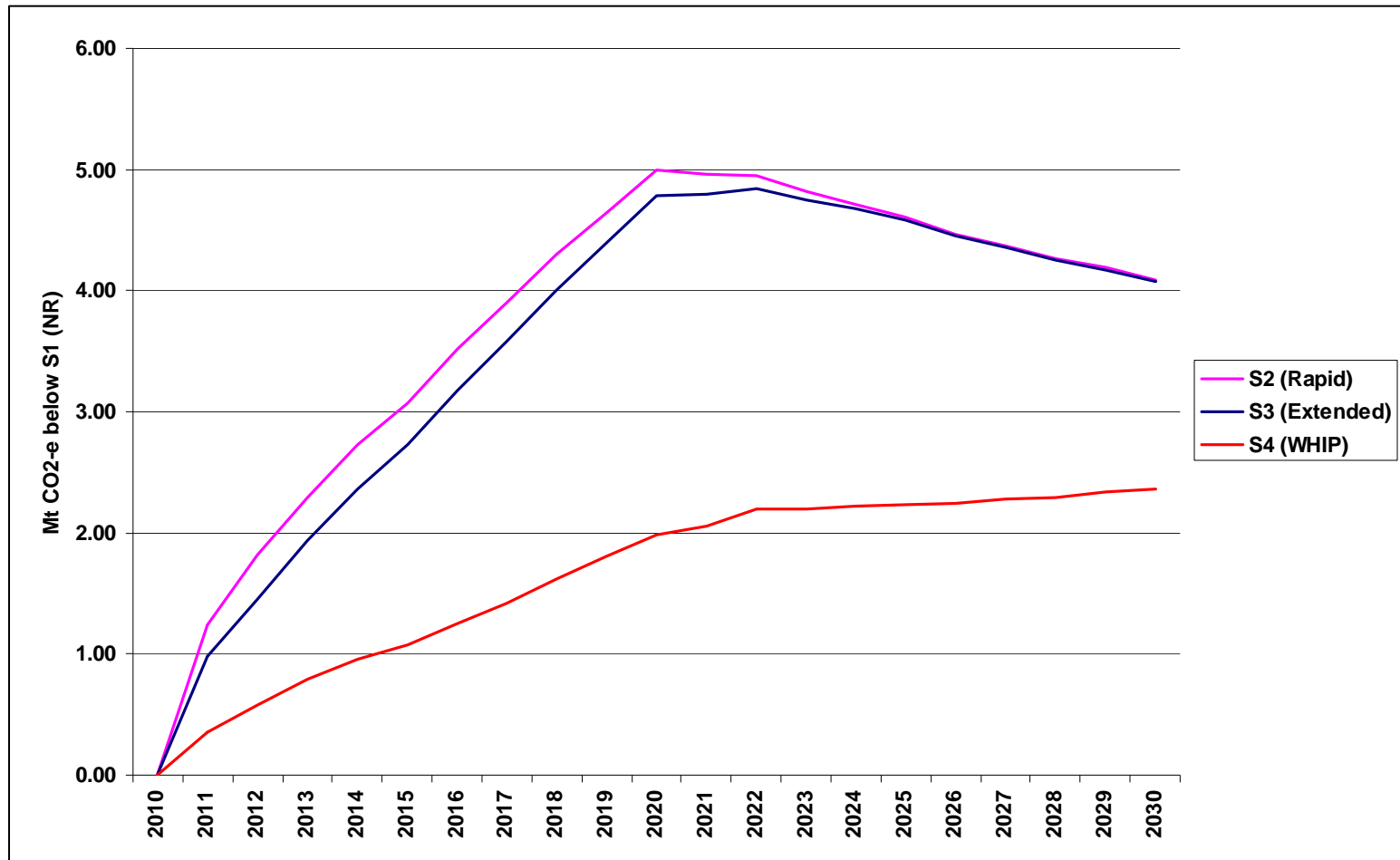
S4 - WH Industry Proposal



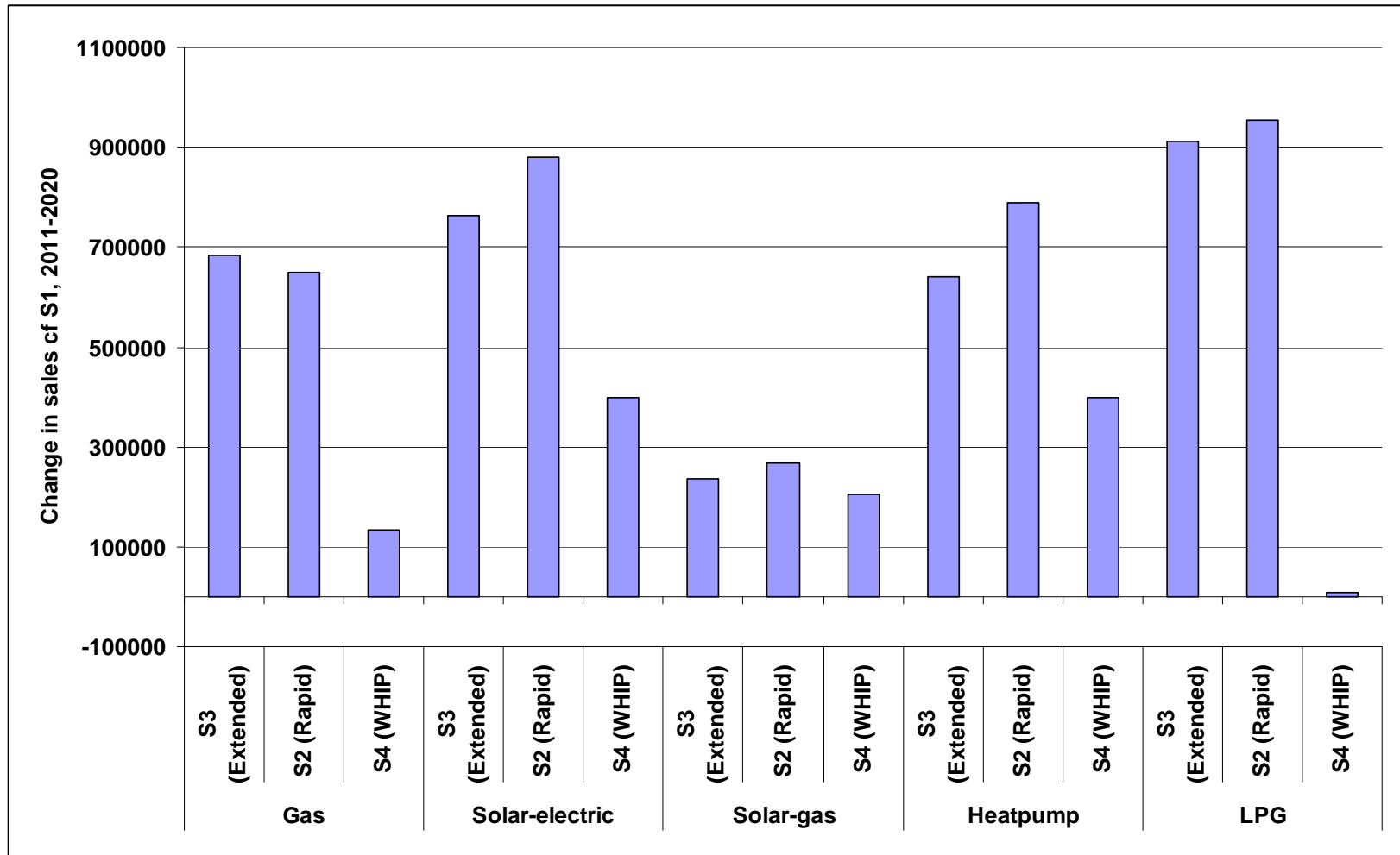
Projected emissions



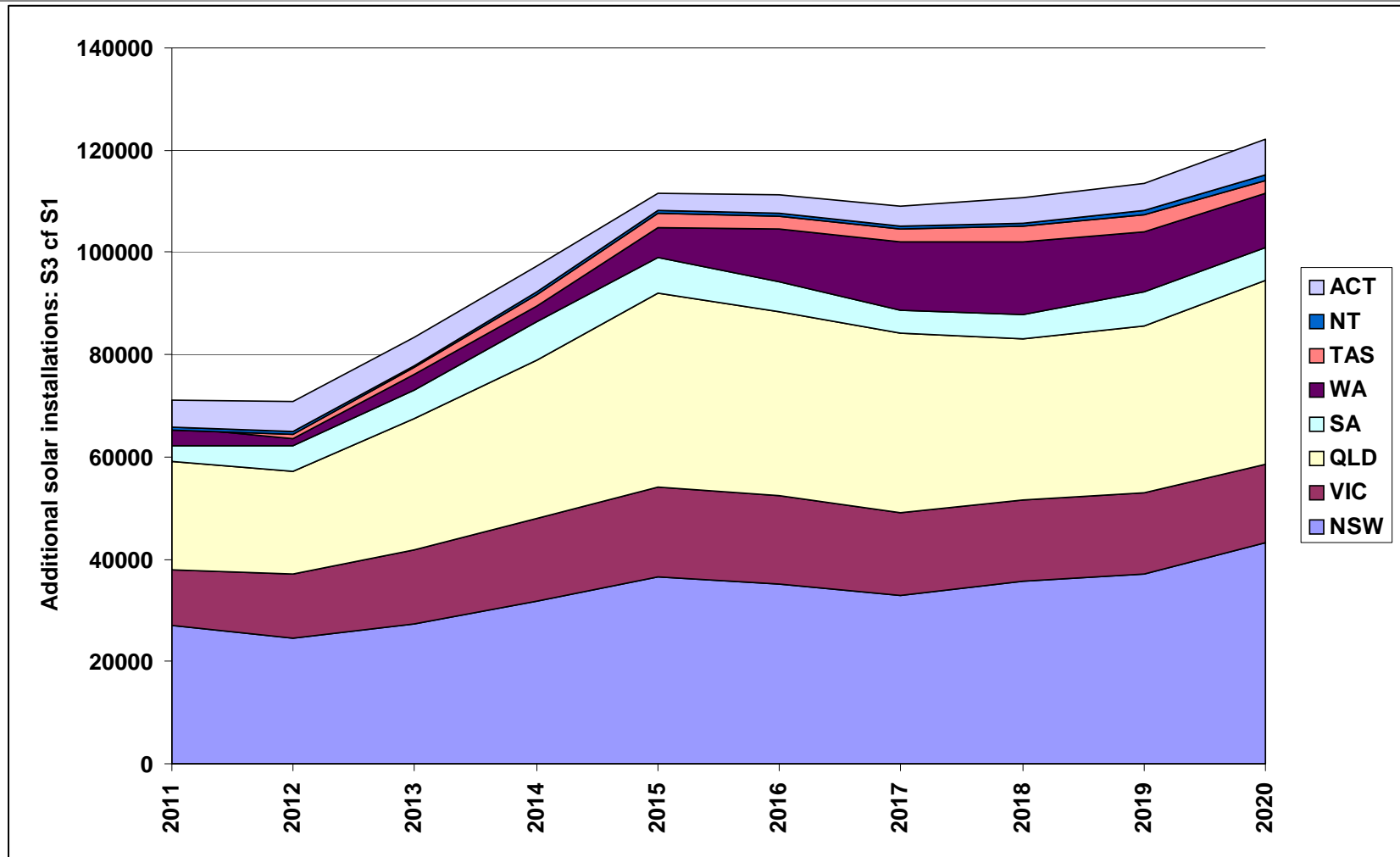
Projected emission reductions



Change in WH market



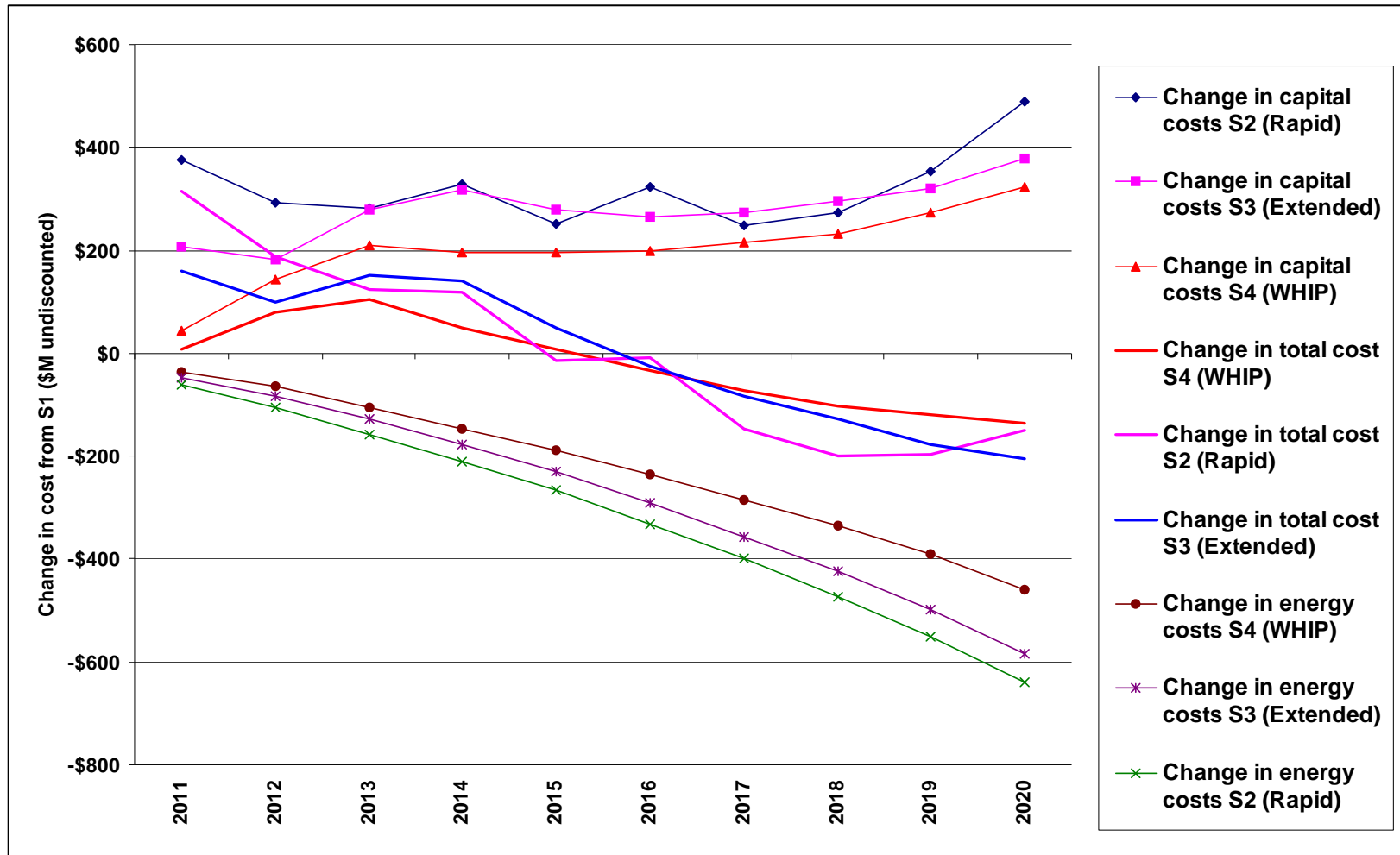
Change in SWH installations



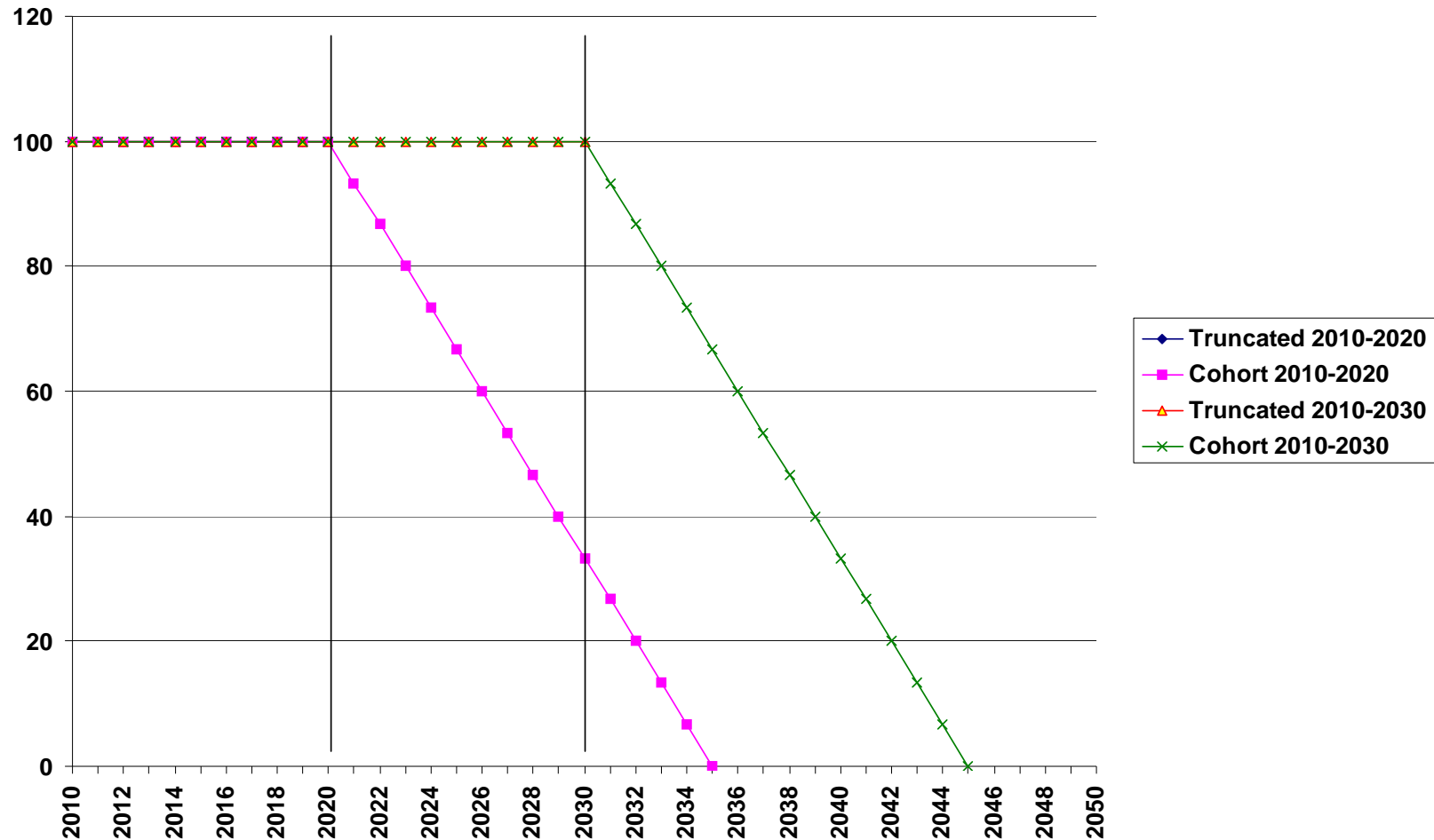
Main findings

- Capital costs increase
 - » Only RECs effect factored in, not rebates
- Running costs fall
- Net annual cost higher until 2016-2017, then lower due to carbon price impacts
- WHIP net impact comparable after 2016
 - » lower costs, lower benefits, less GH reduction
- Little penalty from phased implementation
 - » But costs of 2 year compliance regime could be high

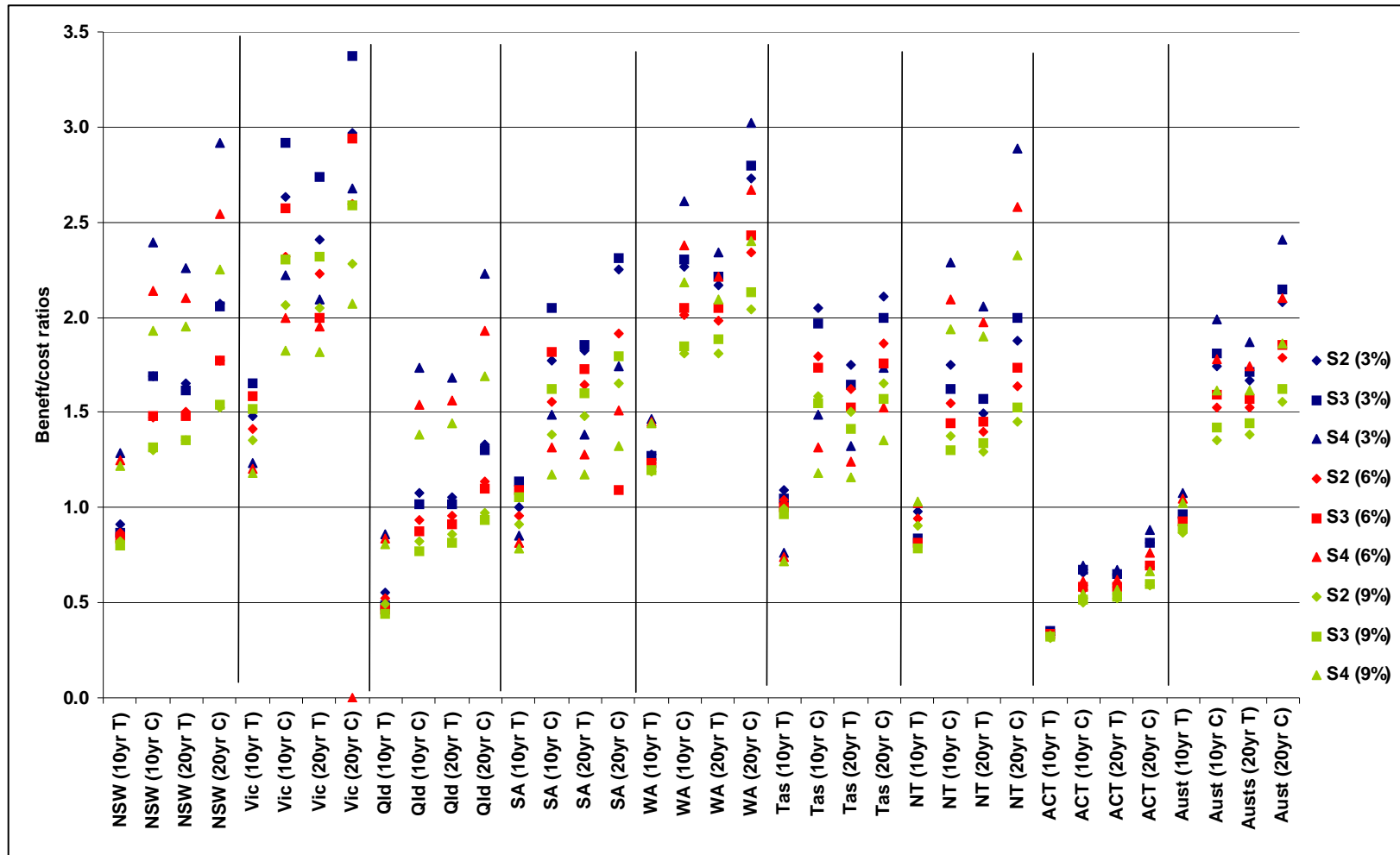
Change in capital & energy costs



Time profiles for NPV calculations



B/C ratios



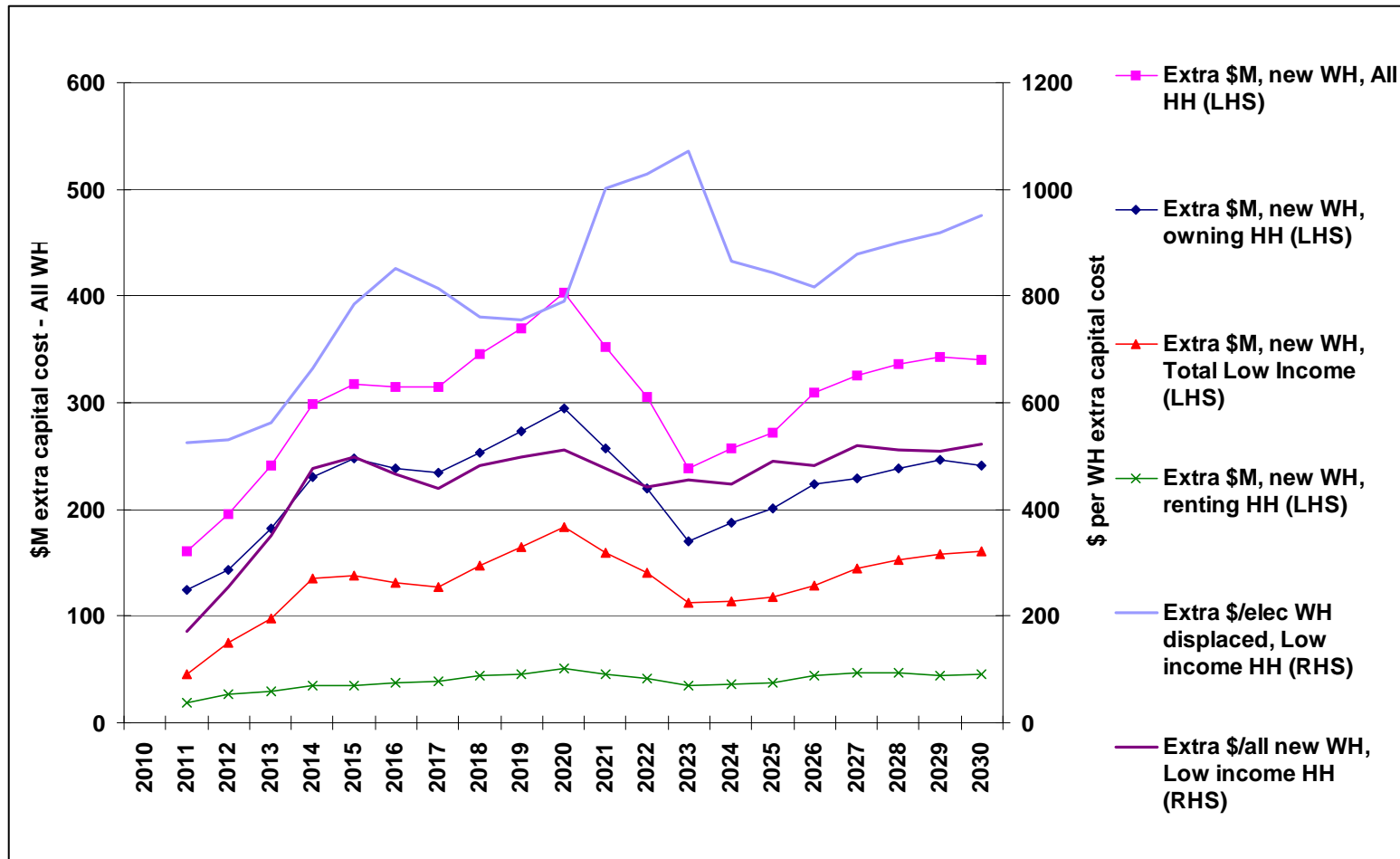
Summary of outcomes

Criterion	Year or Period (a)	Changes compared with 'No Regulations' Scenario (e)		
		S 2 (Rapid)	S 3 (Extended)	S 4 (WHIP)
Cumulative greenhouse reduction	2011-20 C	57.8 Mt CO ₂ -e	53.6 Mt CO ₂ -e	21.9 Mt CO ₂ -e
% emissions reduction compared	2011-20 C	35%	32%	13%
Greenhouse reduction in 2020	2020	5.0 Mt CO ₂ -e	4.8 Mt CO ₂ -e	2.0 Mt CO ₂ -e
NPV Net benefit (cost)	2011-20 C	\$M 1,235 benefit	\$M 1,192 benefit	\$M 1,111 benefit
Benefit/cost ratios	2011-20 C	1.5	1.6	1.8
Implied \$/tonne CO ₂ -e saved	2011-20 C	?\$21.4	?\$22.2	?\$50.8
Increase in avg. WH capital cost	2011-20	\$512 (29%)	\$449 (26%)	\$292 (17%)
Low-income HH WH cap costs	2011-20	\$M 142	\$M 119	\$M 108
Impact on local manufacturing		Neutral	Neutral to negative	Small positive
Impact on installation activity		More positive	More positive	Positive
Net impact on employment		Most positive	More positive	Positive
Administrative complexity		Simplest	More complex	Most complex (d)

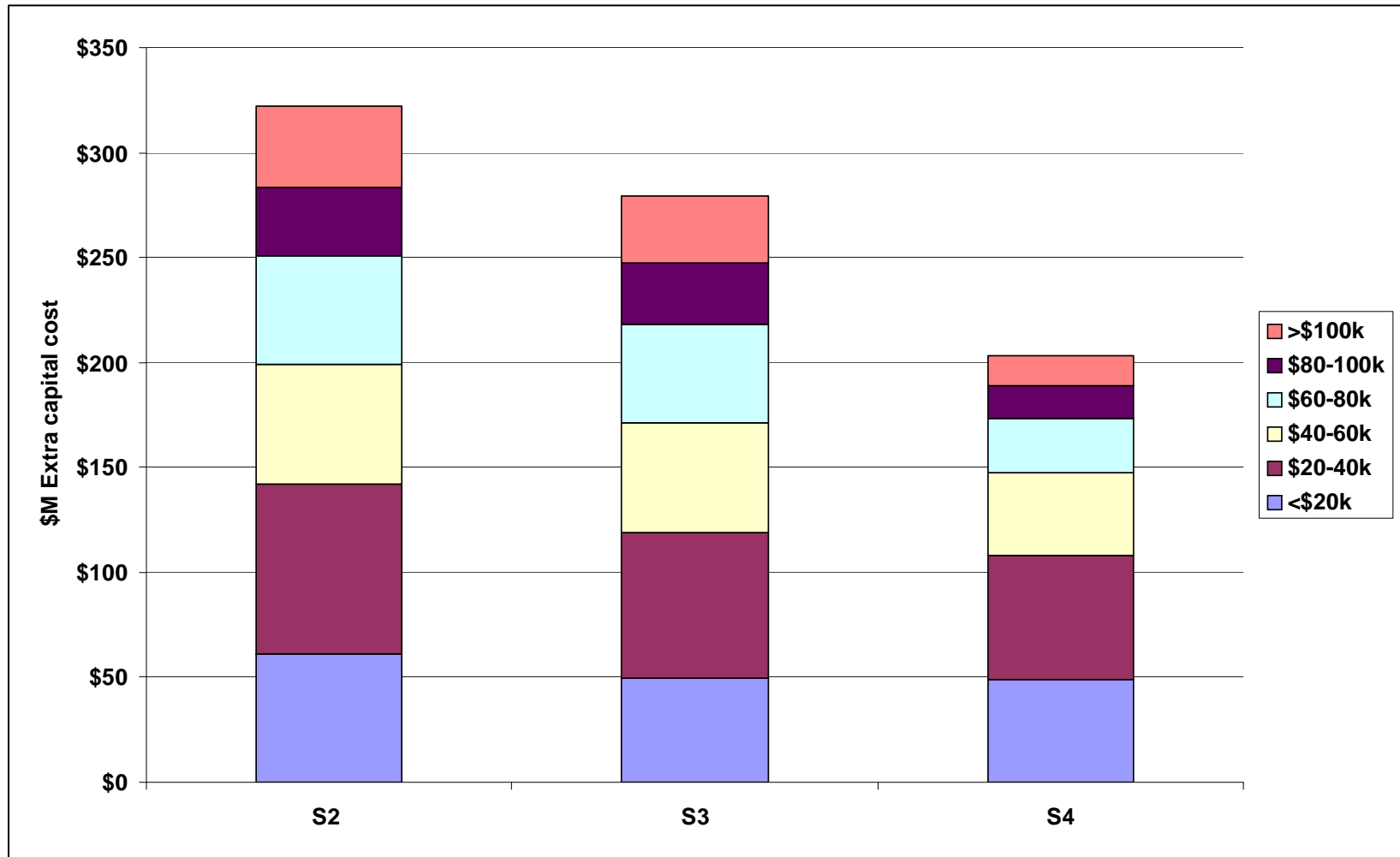
B/C ratios by income group, S3

Income Category	10 Years Cohort	20 Years Cohort	10 Years Truncated	20 years Truncated
\$0-20k	1.09	1.71	1.69	2.00
\$20-40k	0.87	1.61	1.60	1.89
\$40-60k	0.93	1.58	1.57	1.86
\$60-80k	0.83	1.38	1.37	1.62
\$80-100k	0.86	1.54	1.53	1.80
>\$100k	1.02	1.68	1.67	1.97
	0.93	1.59	1.57	1.86
<\$40k	0.96	1.65	1.64	1.93
>\$40k	0.91	1.53	1.52	1.80

Change in average cap costs



Extra cap/yr (2010-2020)



Impact on industry

- Higher revenue to WH industry & installers
- All who make electric also make other types
- S4 WHIP (Rheem, Dux) has slightly higher benefit for local manufacture (concentrated)
 - » S4 needs enforceable definition of 'rental house'
- S2,3 higher benefits for installers (distributed)
- S2,S3 have higher net benefits than S4
- Plumbers & installers need training

Sensitivities, uncertainties

- Energy prices, greenhouse-intensities
 - » CPRS design, timing still uncertain
 - » Tariff structures: will get less rigid (OP will change)
- Hot water usage patterns
 - » Averages OK – timing of drawoffs less certain
 - » Gas & HP performance predictable – solar less so
- Capital costs
 - » Data from rebate schemes gives confidence
- Service life
 - » Assume 2 yr advantage for solar

LPG WH issues

- Could be preferred option off the gas grid
 - » Least cost option for intermittent/small users
- Risks
 - » Could be adopted by cap-constrained households
 - » Could be imposed on renters
- Possible responses
 - » WHIP intended to address, but not effective
 - » Other possibilities, but not discussed in RIS
 - Offer extra solar/HP rebates to all in non-gas areas
 - Target solar/HP rebate offers to tenants in non-gas areas

Recommendations

1. GH-intensive WH to be phased out from C11
2. 2 stages; first in 2010, second in 2012 (ie S3)
3. Stage 1 under own regs, Stage 2 via PCA
4. Stage 1 targeted to houses with lower compliance costs (location or gas-con status)
5. Stage 2 to apply everywhere (with exemptions)
6. Stage 2 to take effect same time everywhere

Recommendations (cont)

7. GH-intensity criteria similar to BCA; method of calc, but compliance based on type ('DTS')
8. General exemption rules similar to new bldgs
9. Jurisdictions to make special exemptions
10. Solar & HP criteria similar to new bldg rules
11. Develop info & training programs for plumbers & installers
12. Develop info programs for electric water heater households, so can think ahead

What happens next?

- Written submissions by 12 March 2010, please
- Water Heating Implementation Group (WHIG) and GWA will consider all submissions
- GWA will prepare Decision RIS
- OBPR to review Decision RIS before it is submitted to Ministers

THANK YOU – ANY QUESTIONS?

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