Evaluation of the impacts of the Commonwealth's carbon price package announced 10 July 2011

EVALUATION OF THE IMPACTS OF THE COMMONWEALTH'S CARBON PRICE PACKAGE ANNOUNCED 10 JULY 2011

1. SUMMARY

The following evaluation is based on an analysis of the modelling released by the Commonwealth, supplemented by independent analysis[1] commissioned for the NSW Government.

It should be noted that the Commonwealth's independent consultants' reports have not yet been released. This evaluation will be updated when these reports become available.

1.1 Industry and Regional Impacts based on Frontier Economics modelling

Whole of NSW –

- *Gross State Product* - At 2030, the reduction in NSW GSP is the greatest of any mainland State, at (-)1.53 per cent. In real terms (after adjusting for inflation), the loss of output in NSW is $3.7 billion a year in 2020 rising to $9.1 billion in 2030.
- *Employment* – At 2030, employment is expected to be 31,000 less than in the reference case.

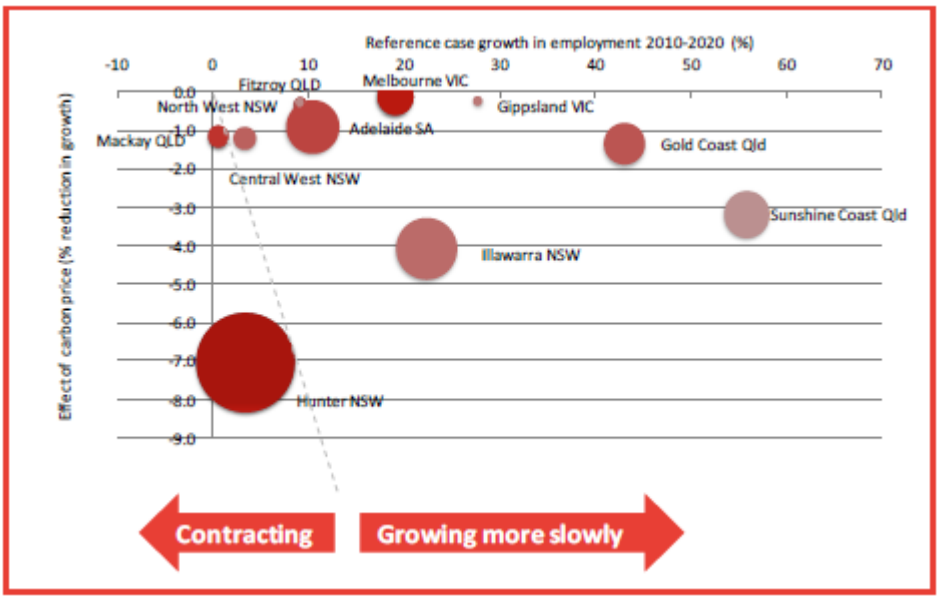
Regional:

In terms of proportionate impacts on regional employment, the most adversely affected region in Australia is the Hunter, while the Illawarra and Central West NSW are among the worst-affected regions in the country (see figure below):

- *Hunter* – absolute reduction of 18,500 jobs at 2020.
- *Illawarra* – slower job growth - 7,000 fewer jobs at 2020.
- *Central West* – about 1,000 fewer jobs at 2020.

[1] Frontier Economics, *Carbon Price Modelling: Final Report to the NSW Government*, August 2011, which can be accessed on the NSW Treasury website (http://www.treasury.nsw.gov.au/)

Regions Most Adversely Affected by the Carbon Price: Employment



Source: Frontier Economics, *Carbon Price Modelling*, final report to the NSW Government, August 2011, p.28.

1.2 Impact of carbon price on electricity retail prices

A 38% increase in wholesale electricity prices (Commonwealth estimate for the period 2013-2017 cited in its modelling report) would be expected to result in an increase of around 15% on final retail electricity prices, inclusive of network costs. Further detailed modelling and/or further analysis of the Commonwealth modelling reports (when they are released) would be required to confirm this impact.

1.3 Impacts on the NSW Budget

(See table overleaf)

FISCAL IMPACT OF THE COMMONWEALTH'S CARBON PRICE POLICY

($ MILLIONS)

	2011-12	2012-13	2013-14	2014-15
Revenue:	**-45**	**-152**	**-113**	**-275**
Generator dividends and tax equivalents	-45	-215	-150	-290
Other budget revenue:				
Payroll tax		-23	-32	-42
GST revenue		86	69	57
Recurrent expenditure:				
Low estimate (partial carbon price pass-through)		**-94**	**-94**	**-94**
High estimate (full carbon price pass-through)		**-121**	**-121**	**-121**
Direct electricity cost impacts:				
Low estimate (partial carbon price pass-through)		-44	-44	-44
High estimate (full carbon price pass-through)		-71	-71	-71
Other agency costs (indirect)		-50	-50	-50
Impact on each of Operating Balance and Net Lending:				
Low estimate	**-45**	**-246**	**-207**	**-369**
High estimate	**-45**	**-273**	**-234**	**-396**

NOTE:
While NSW has no legal liability to compensate Greenhouse Gas Reduction Scheme (GGAS) and Energy Savings Scheme (ESS) participants upon closure of these schemes, in the event they make compensation claims, these could amount to $94m in 2012-13 on current estimates (up to $80m for GGAS and up to $14m for ESS).

On the revenue side, the direct impacts of a carbon price will be reflected in:

- Lower distributions from NSW electricity generators - a reduction of $45 million in 2011-12, $215 million in 2012-13, $150 million in 2013-14 and $290 million in 2014-15.
- coal royalties – royalties from international coal exports are unlikely to be affected by a carbon price during the forward estimates period. There is insufficient information presently available to estimate the reduction in coal that will be used by Australian generators. However, a 10 percent reduction in domestic coal demand is estimated to reduce coal royalties by around $11 million in 2012-13.
- Possible reduction in revenue from some state taxes arising from a weaker economy due to a carbon tax, which may be offset by an increase in other revenues due to higher inflation (as CPI adjustments apply to many state tax and nontax revenues).

On the expenditure side:

- the immediate impact via an increase in electricity prices for government agencies will cost at least $44m in 2012-13 based on Commonwealth Treasury's estimates. If a carbon tax is fully passed through, this could cost up to $71m p.a.
- other flow on impacts for State Government input costs – initial estimate of $50m per annum.

- the carbon tax could also put pressure on the expenditure side by increasing the demand for State government services and concessions.
- Although NSW has no legal liability to compensate scheme participants in GGAS and ESS, these participants could potentially put pressure on the NSW Government for compensation from the closure of these schemes:
  - Potential claims due to the termination of NSW GGAS are currently estimated in the range of $70-80 million. Work is underway to assess possible impacts on projects of GGAS participants, so this estimate may be refined further.
  - Potential claims due to closure of the ESS when the Commonwealth implements a national energy efficiency scheme are currently estimated at up to $14 million.

2. MODELLING THE IMPACTS OF A CARBON PRICE

This analysis must be a preliminary assessment for a number of reasons.

- The Commonwealth is yet to fully document its assumptions or results – they have not provided a list of liable emitters.
- Assumptions and forecast developments in the electricity sector are crucial, as much of the initial structural change occurs in the electricity sector, and the mechanism for transmitting many of the impacts is electricity prices.

  Despite the significance of the electricity sector, the Commonwealth is yet to release its detailed electricity modelling reports. Once those reports are released, we will be better able to compare the Commonwealth's and NSW's assumptions and modelling.
- The Commonwealth's modelling report reflects at least ten different models run over a period of months. But the Commonwealth's modelling report does not incorporate the precise features of the Clean Energy Future package as announced.
- The initial assessment focuses on replicating the central scenarios formulated and assessed by the Commonwealth, so that we can compare NSW impacts on a like-for-like basis with Commonwealth findings.

  But implications for NSW also need to be assessed under alternative assumptions not publicly canvassed by the Commonwealth, such as the rest of the world implementing carbon policies more slowly.

- The additional NSW analysis utilises the same central model of the Australian economy the Commonwealth uses, coupled with alternative electricity modelling from that used by the Commonwealth.

In interpreting both the Commonwealth and NSW results, the natural limitations of the macroeconomic models and related assumptions used in these exercises should be considered:

1. They assume away difficulties posed by economic disruptions – that is, the rules of the model require a smooth transformation of the economy's structure.

   For example, these rules presume capital will be available to restructure Australia's energy sector and that workers will reduce wage demands and move locations in response to unemployment in ways that are not as easy to achieve in reality.

2. They ignore the implications of current economic conditions for structural adjustment.

   For example, the uncertainties posed by the risks of a further global economic downturn from a European sovereign debt crisis are not factored into investment and consumption decisions in the model.

3. The Commonwealth presumes Australia's actions are against a backdrop of significant global abatement efforts, and that will allow Australia to import permits at a lower cost than domestic alternatives, and that "leakage" will not occur.

4. They assume the existence of a credible international permit market.

It is fair to say that the modelling undertaken by Commonwealth Treasury has been considered, rigorous and complex. However, alternative assumptions are in many cases plausible and can have significantly different outcomes. A 50-cent change in the gas price, for instance, can change coal generators' profitability significantly.

Some of the most critical modelling assumptions are based on past observations, though the past can be a poor guide to the future. For example, the Commonwealth's overall conclusion that the economy continues to grow strongly is due to assumptions about sustained future productivity growth resembling that of the past. If that assumption doesn't hold true, nor does the conclusion of ongoing strong growth.

The essential point of all these qualifications is that modelling cannot "prove" the case, only suggest possible outcomes under sets of often restrictive assumptions.

One way to mitigate some of the limitations of the models is to undertake sensitivity testing of key assumptions. The Commonwealth provides very limited commentary on its sensitivity testing. The most significant omission is a scenario without global action. NSW Treasury will further investigate the implications of alternative sets of assumptions for impacts on the State. These assessments will consider different levels of global action to reduce emissions, levels of energy demand and investment in the electricity sector.

Impact of Large Scale Renewable Energy Target

Discussion of carbon pricing impacts can neglect the significant impacts associated with related Commonwealth abatement policies. With the introduction of a carbon price, the policy question regarding other Commonwealth abatement policies is whether they complement carbon pricing or not.

Many of the Commonwealth's additional measures do not pass this "complementarity" test. To be complementary, they would most obviously need to relate to sectors not covered by the tax, like agriculture, or demonstrate their capacity to be self-funding, as might be the case with some energy efficiency measures.

However, currently there are a number of inefficient additional measures that cut across carbon pricing, predominantly subsidies for renewables in the electricity sector like the large-scale Renewable Energy Target (RET). Assessments of the RET suggest that it has already produced around 10 Mt of abatement in the electricity sector, and that independently of a carbon price, this could be expected to rise to 30 Mt by 2020.

The RET is a very inefficient way of achieving abatement relative to a carbon price, coming at an average cost of around $90 per tonne. The RET is estimated to have added around $4 per MWh to retail prices in 2010, and that independently of a carbon price could be expected to rise to $11 per MWh by 2020.

Of particular concern to NSW is that the RET has created significant losses of value for NSW Government-owned generators and is expected to lead to even more losses in the future. Non-complementary measures like the RET should be phased out. NSW should seek compensation for these losses, especially in regard to future impacts, subject to additional work assessing the losses of value attributable to the RET.

3. IMPACTS ON THE ECONOMY

3.1 Industry Impacts

The Commonwealth modelling report, *Strong Growth, Low Pollution* does not provide State-specific industry details beyond the graph on the next page. However, some idea of the impact on NSW can be gleaned from the estimated impact on industries.

The Commonwealth report concludes that impacts from introducing a carbon price would vary widely across industries. The detail shows some industries facing significantly diminished prospects if Australia introduces a carbon price, even if some of the most affected industries continue to grow over time. For example, the Commonwealth modelling suggests a carbon price will see the following industries' output significantly smaller at 2020 than would otherwise be the case[2]:

- gas extraction (1.5 percent smaller)
- coal mining (2.3 percent smaller)
- coal fired electricity generation (9.6 percent smaller).

With respect to both coal and gas mining industries, output is still expected to grow in an absolute sense in the period to 2020, with the carbon price diminishing their growth, as described above. However, in the case of coal-fired electricity generation, the Commonwealth modelling suggests the carbon price drives an absolute decline in output against 2010 levels of 9 percent in the period to 2020.

The Commonwealth modelling suggests that the carbon price will drive even more marked relative shifts in some industries' prospects over the longer term. For example, in the period to 2050, the carbon price will mean some industries' output is markedly smaller than would otherwise prevail[3]:

- gas extraction (7.2 percent smaller)
- coal mining (17.1 percent smaller)
- iron and steel manufacturing (21.3 percent smaller)
- aluminium manufacturing (61.7 percent smaller)
- coal-fired electricity generation (71.4 percent smaller)

[2] Australian Government (July 2011), *Strong Growth, Low Pollution: Modelling a Carbon Price*, Table 5.6, p.93.
[3] Ibid., Table 5.7, page 94.

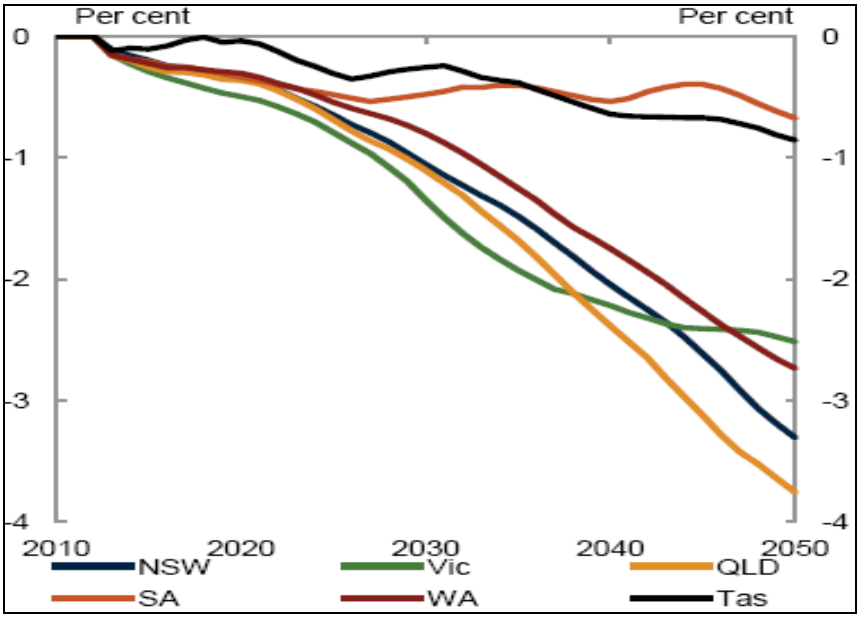
In an absolute sense, the coal, gas and iron and steel industries still grow to 2050, but realise less growth. However, both coal-fired generation and aluminium smelters face absolute declines in their output. Against 2010 levels, the smelters' 2050 output is expected to fall by 49 percent, and the generators by 47 percent. Much of these impacts are due to global shifts in demand, given that the Commonwealth has assumed that there will be substantial global abatement actions taking place.

The Commonwealth's modelling report does not explicitly predict plant closures, but smelter closures would be consistent with the modelling results. In its submission on the 2008 Carbon Pollution Reduction Scheme (CPRS), Norsk Hydro cited real risks of closure, noting its Kurri Kurri smelter is small by world standards and lacks economies of scale. The picture is less clear in the electricity sector, as the Commonwealth is yet to release its detailed electricity modelling reports.

3.2 Regional Impacts

The Commonwealth provides limited analysis of regional impacts in *Strong Growth, Low Pollution*. What information is available is provided at the State level, rather than the regions within States. For example, Figure 1 below suggests the carbon price will drive the greatest relative declines in Gross State Product (GSP) by 2050 in Queensland and NSW, albeit that the decline is initially sharpest in Victoria:

Figure 1:
Change in Gross State Product (core policy scenario) based on Commonwealth modelling



Source: Commonwealth Treasury (2011), *Strong Growth, Low Pollution*, Chart 5.37, p.122.

NSW's assessment of State level impacts on Gross State Product (GSP) varies from the Commonwealth's:

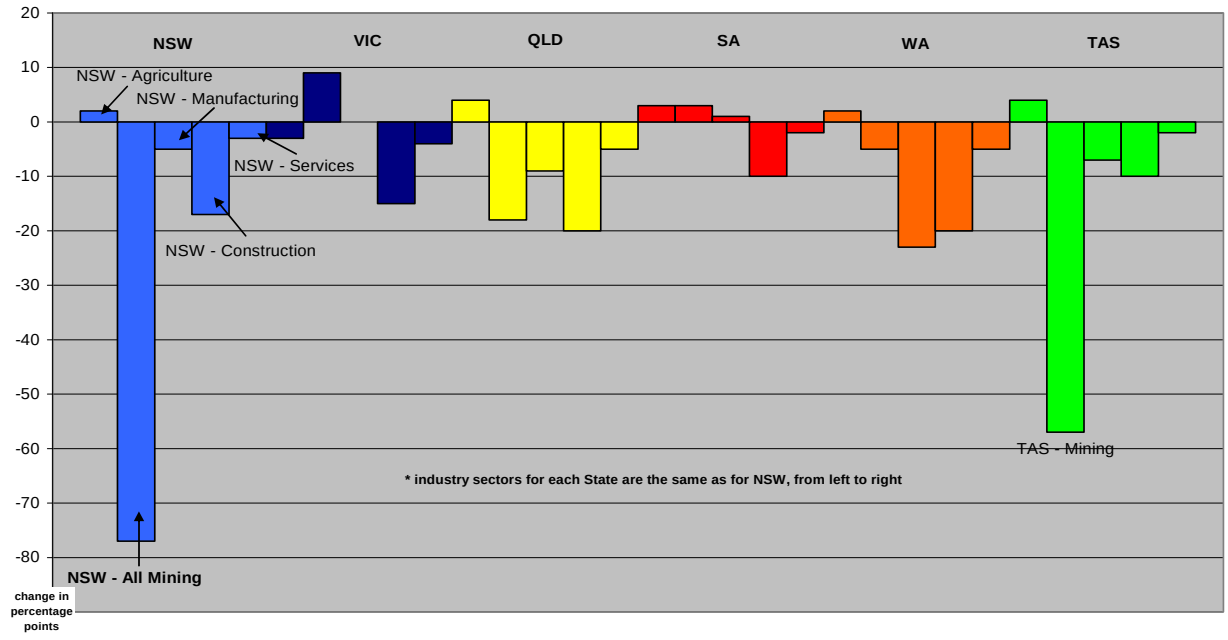
- The Commonwealth places the impacts on most States as reductions of around (-)0.3 to (-)0.5 per cent a year at 2020, with NSW at (-)0.32 per cent against a national decline of (-)0.33 per cent a year.
- Frontier modelling suggests a reduction in NSW GSP of (-)0.8 per cent a year at 2020, compared to a national average reduction of (-)0.48 per cent a year.

Commonwealth estimates for each of the States deviate only marginally from national averages, with their reported results inconsistent with the distribution of impacts within the MMRF macroeconomic model. A possible explanation for this is that the Commonwealth estimates ignore the MMRF results and attribute costs to the States based on simple assumptions using average emissions intensity, although this is not explained in their modelling report.

Modelling undertaken for the NSW Treasury suggests that at 2030, the reduction in NSW GSP is the greatest of any mainland State, at (-)1.53 per cent. In real terms (after adjusting for inflation), the loss of output in NSW is $3.7 billion a year in 2020 rising to $9.1 billion in 2030.

The Commonwealth has offered some analysis of the relative shift in industry level prospects across the States. Most notably, the report suggests the NSW mining industry will be disproportionately affected by a carbon price, suffering the greatest relative reduction in its growth prospects of any State sector assessed in the modelling report (see Figure 2 below). In round numbers, the figures imply carbon pricing will reduce the NSW mining industry's growth to about 60 percent of what it otherwise would have been. This large impact is in part because coal accounts for a greater proportion of NSW mining industry than in other States.

Figure 2: Relative Change in States' Industry Sector Growth Outcomes to 2050 under a Carbon Price*



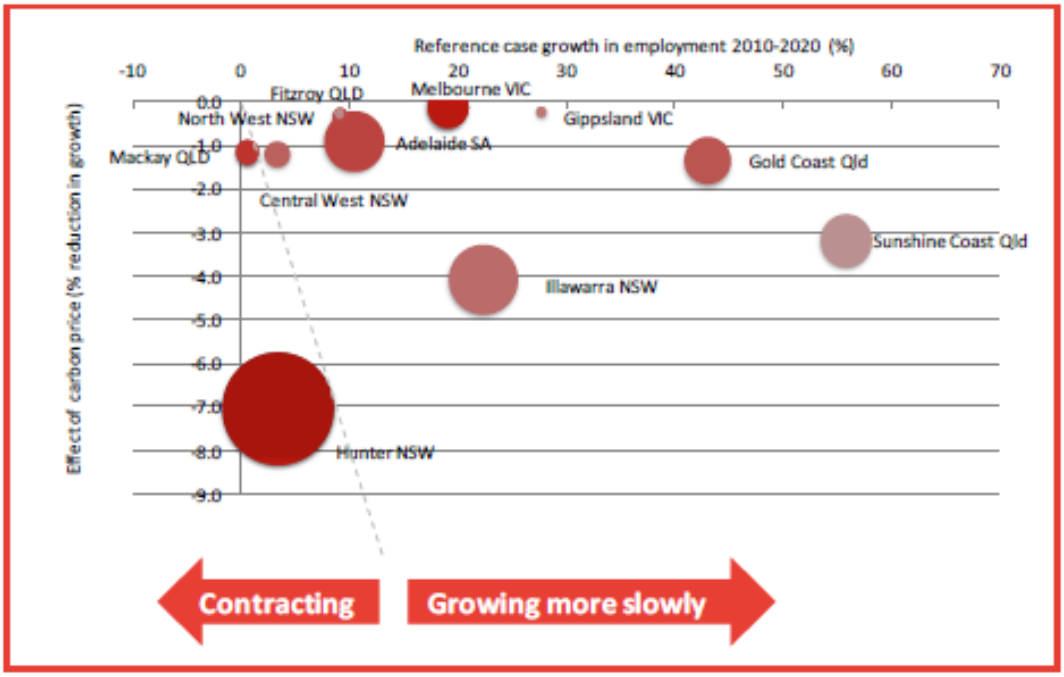
Source of data: Commonwealth Treasury (2011), *Strong Growth, Low Pollution*, Table 5.18.

As noted, the Commonwealth's report does not incorporate sub-State regional impacts. Modelling by Frontier Economics commissioned by NSW suggests that in terms of proportionate impacts on regional employment, the most adversely affected region in Australia is the Hunter, while the Illawarra and Central West NSW are among the worst-affected regions in the country.

- Introducing a carbon price sees 18,500 fewer jobs in the Hunter at 2020.
- Under a carbon price employment in the Illawarra contracts by more than 7,000 jobs at 2020 relative to the reference case.
- In the Central West introducing a carbon price in Australia results in the loss of almost 1000 jobs at 2020 relative to the reference case.

Figure 3 below depicts the relative impacts on the most adversely affected regions. The size of the circles represents the relative scale of employment changes in those regions.

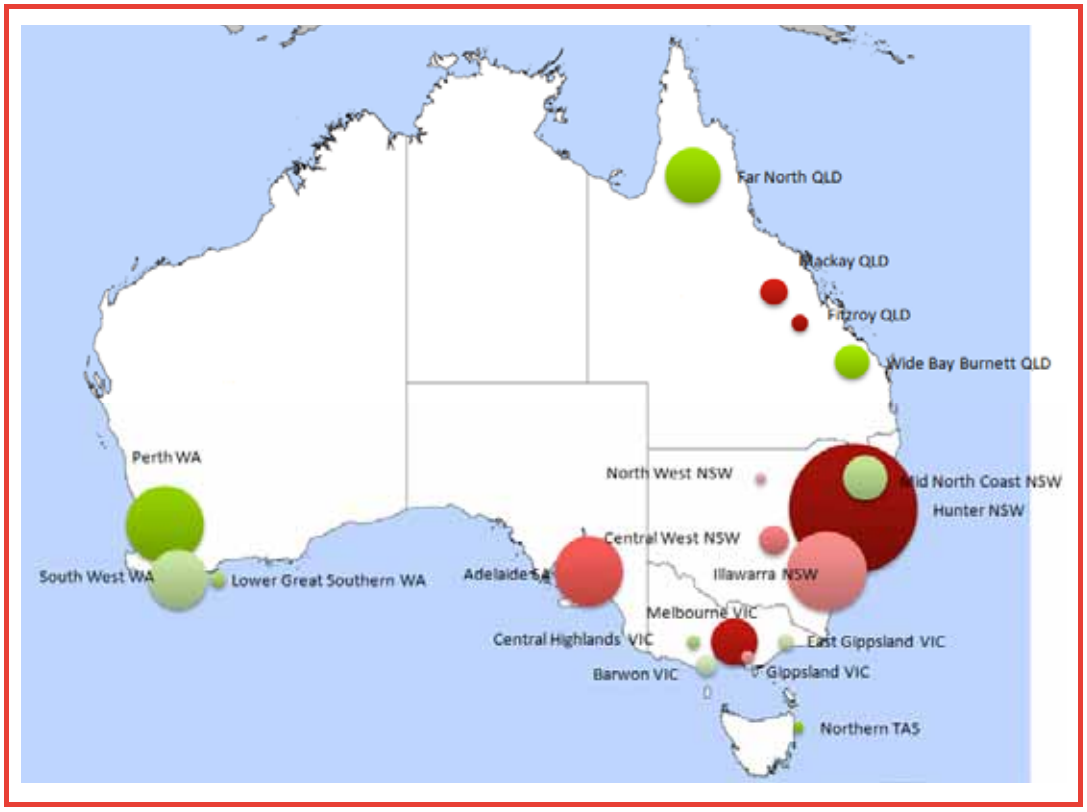
Figure 3: Regions Most Adversely Affected by the Carbon Price: Employment (Percentage change, carbon price scenario vs reference case)



Source: Frontier Economics, *Carbon Price Modelling*, final report to the NSW Government, August 2011, p.28

Frontier's modelling also bears out the geographic dispersion of impacts from the carbon price package across Australia. Figure 4 demonstrates the adverse impacts are generally confined to the regions, and the prominence of NSW regions among the adverse impacts.

Figure 4: Geographic Dispersion of Employment Effects of the Carbon Price Package (Difference, employment levels in carbon price scenario vs reference case



Source: Supplementary chart provided by Frontier Economics to NSW Treasury, 20 July 2011.

Frontier's findings take into account the Commonwealth's Jobs and Competitiveness package and household assistance measures. Since Frontier's findings are based on a general equilibrium model, it also takes into account job gains in other sectors and regions, including from other policies such as the renewable energy target. Frontier found that Australia-wide, the renewable energy sector is the sector that benefits the most from a carbon price.

4. IMPACT ON HOUSEHOLDS

4.1 Impact of carbon price on residential electricity prices

The most clearly visible impact of a carbon price is on retail electricity prices.

Energy costs represent approximately forty percent of a residential electricity bill[4]. The Commonwealth's modelling shows that the wholesale electricity price will rise by approximately 40% on average across Australia from 2013. Year by year prices are shown below.

[4] Box 1 of IPART's "Consumer Fact Sheet" on " Reviewing electricity price increases for 1 July 2011" at http://www.ipart.nsw.gov.au/files/Consumer%20fact%20sheet%20-%202011%20Annual%20review%20of%20wholesale%20energy%20costs%20and%20cost%20pass%20through%20applications%20-%20February%202011%20-%20Website%20version.PDF

Table 1: Average wholesale electricity prices, Australia

Average wholesale electricity prices ($ per MWh)	2012	2013	2014	2015	2016	2017	2018	2019	2020
Global action	43	44	44	47	48	46	49	51	52
Core policy	43	61	63	65	66	67	69	67	67
Core Policy Price Increase over Global Action	0%	39%	43%	38%	38%	46%	41%	31%	29%

Source: Commonwealth spreadsheet for Chart 5.27, p.111 of modelling report.

The Commonwealth modelling document states that the average New South Wales wholesale electricity price increase is 38% for the period between 2013 and 2017.

Energy costs for small consumers are higher than average energy costs. Small consumers have a different load profile to the average market profile and the energy purchases supporting small consumers are largely met through energy contracts rather than from the spot market. However, it is reasonable to assume that wholesale electricity prices for small consumers will rise approximately in proportion to average wholesale electricity prices. A thirty eight percent increase in wholesale electricity prices would therefore be expected to have around 15% impact on final retail electricity prices, inclusive of network costs.

The Commonwealth estimated that average household electricity prices will increase by 10% over 2013-17 under the core policy scenario.

IPART's 2010 analysis estimated that annual average household electricity bills would increase by 15% to 22% in 2012-13 as a result of a $26 carbon price under the former CPRS scheme. The Commonwealth Government is now proposing a $23 carbon price in 2012-13 but has stated that they expect the average household electricity price increases due to the carbon price to be only 10% in 2012-13. One possible explanation for the difference between the two estimates is a difference in the assumed carbon cost pass-through, although this cannot be confirmed from the Commonwealth documentation.

IPART would need to fully re-model their determination in order to determine the actual residential price impact of the current proposal.

4.2 Social Impacts from Dislocations

Prospective social impacts would stem from employment impacts and real wage and income impacts. No State level detail is provided in the Commonwealth modelling report. The Commonwealth modelling contains no information on social impacts from possible dislocations.

As is the case with macro models, the difficulties of economic adjustment are assumed away, presuming that workers adjust their wage demands and move to where the jobs are in a more or less costless fashion. Clearly, the relevance of those assumptions to the real world assumptions is open to challenge.

Social costs flow from the process of economic adjustment and consequent dislocations of economic activity. Dislocations can see industries and businesses stagnate or even shut down, with many workers facing a choice between unemployment and a change of occupation, if not geography.

As demonstrated, the adjustment task for the regions will be larger in relative terms than it is for metropolitan areas. This is because of a number of reasons:

- many of the most emissions intensive activities are essentially regionally based
- in general, there is a wider, deeper pool of potential occupations available in metropolitan areas
- some aspects of life in large metropolitan centres are more anonymous, which can mean social impacts from significant changes can be less apparent.

Among regions, the Hunter, the Illawarra and Central West regions in NSW can be expected to be disproportionately impacted by carbon pricing because of the regional impacts identified earlier in this report.

4.3 Cost of Living Impacts for Sydney

The modelling report provides no data which provides for an analysis of cost of living impacts specifically for Sydney households. There is no information given on housing costs. Further analysis and modelling would be required to properly investigate this.

5. IMPACTS ON THE NSW BUDGET

Generally, the long run impacts of any major policy change could be expected to affect both the revenue side and expenditure side of the Budget.

On the revenue side, the direct impacts of a carbon price would be reflected in dividends from NSW electricity generators – this aspect is discussed in the next section. A carbon price could also affect NSW tax revenue indirectly via its effects on the general economy, which in turn would affect specific state tax bases. (For instance, a drop in employment due to the carbon tax could reduce payroll tax revenues.) Estimates of this second aspect would depend on the change in GSP and employment at the State level. This is considered further below.

On the expenditure side, the immediate impact would occur via an increase in electricity prices faced by government agencies, discussed below. Expenditure will also be increased to the extent that the carbon tax impacts on the costs of the goods and services the Government purchases. The carbon tax could also flow onto the expenditure side by changing the demand for government services or concessions. The Commonwealth report does not cover this. Both of these impacts are considered further below.

5.1 Revenue

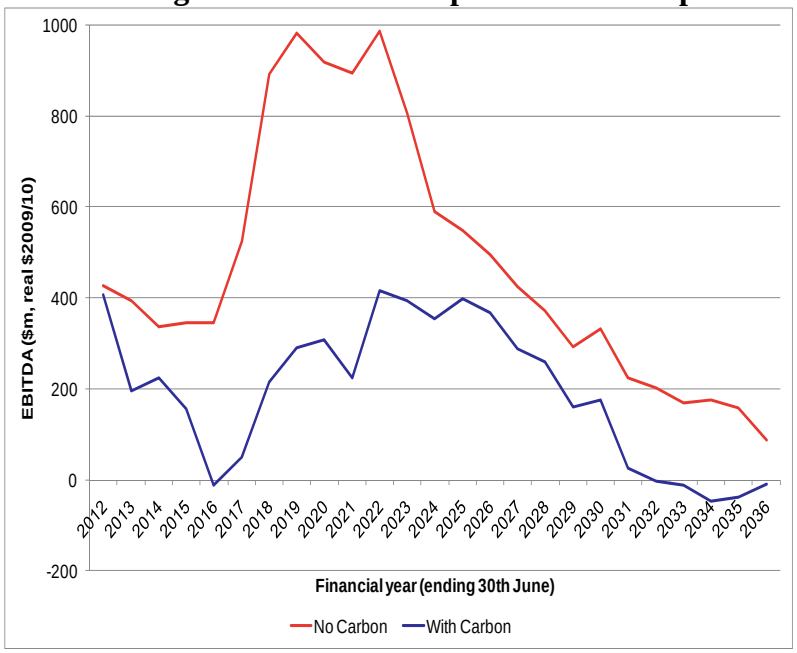
5.1.1 Impact on NSW generators

Latest estimates provided by Macquarie Generation and Delta show a reduction in total financial distributions (dividends and tax equivalents) of $45 million in 2011-12, $215 million in 2012-13, $150 million in 2013-14 and $290 million in 2014-15.

In view of its adverse impact on generator profitability, in the event the Commonwealth does not phase out the Renewable Energy Target (RET) with the introduction of a carbon price, the NSW Government could consider the option of NSW seeking Commonwealth compensation for the adverse impacts of the RET on generator profitability. (See section 2 above for further discussion of issues with the RET.)

Modelling undertaken by Frontier Economics for NSW Treasury shows the following cash flows and net present value impact on the Government's operating non-gentrader coal fired power stations (Vales Point, Bayswater and Liddell):

Figure 5: Modelled impact of a carbon price on Cash Flows (EBITDA)



Case	NPV (7%)
No carbon	$6,091
With carbon	$2,530
Loss	$3,561
% loss	58%

As with all modelling, the modelling behind the above graph and NPV analysis adopts a number of underlying assumptions. The underlying assumptions in the above analysis include energy and peak demand growth that is consistent with the Australian Energy Market Operator's 2010 forecasts, and (at NSW Treasury's request) uses projected gas prices that were 50 cents above the level forecast by ACIL Tasman for AEMO in April 2009. This gas price adjustment was made in order to better align projected gas prices with more up to date views. Frontier Economics are also Macquarie Generation's modeller, and the above modelling also incorporates some of Macquarie Generation's assumptions, including assumptions on forward coal prices.

As a result of the NSW energy reform transactions, Delta now operates two distinct businesses after half of Delta's assets (Western Power Stations: Mt Piper and Wallerawang) was transferred to TRUenergy under the Gentrader model. In relation to the Western Power Station business, Delta's core activities are to manage and operate the plant while TRUenergy undertakes all electricity trading functions and assumes all carbon risks and associated benefits. As Delta West will operate as a break-even business from 1 March 2011, Treasury does not expect annual dividend and taxes from the Delta West portfolio.

The other half of Delta is still engaged in electricity trading activities and assumes all carbon risks in relation to the Delta Coast Power Stations, namely coal-fired plant Vales Point and an open cycle gas peaker, Colongra. Last year Colongra generated 67GWh of energy, whilst Vales Point generated 6,196GWh. This part of Delta's business will continue to operate as a profit making entity and to pay annual dividend and taxes where applicable.

The proposed carbon tax will impact Delta Coast's profitability as well as asset value. Delta has undertaken modelling of their Coastal operations with assistance from ACIL Tasman to determine the impact of the proposed carbon tax. Based on ACIL spot price forecasts, Delta Coast expects to suffer losses from 2012-13 to the end of the forward estimates period in 2014-15 but expects to recover after that year. Delta also forecasts a $340 million reduction in asset value (in 2010-11 terms) as a result of a carbon tax that commences in 2012-13.

Eraring Energy is also subject to Gentrader agreements, so the Government is not financially impacted by the carbon tax applying to them.

The Commonwealth has been quoted in the Australian Financial Review (28/7/2011) suggesting that renewable energy assets have grown in value as a result of introducing a carbon price, and that the Commonwealth, NSW and Victoria (as the shareholders in the Snowy Hydro scheme) stand to benefit from a carbon price. This issue is under investigation. Preliminary indications are that any benefits to NSW would offset around 11 percent of the estimated value impairment of Bayswater, Liddell and Vales Point (shown in Figure 5).

Public vs private ownership

The Australian Government appears to have accepted the in-principle argument for assistance to emissions-intensive coal-fired power stations, and will provide assistance through an Energy Security Fund[5].

However, the criteria for eligibility for assistance effectively are a stronger bias against Australian public ownership than was present in the assistance arrangements proposed for the Carbon Pollution Reduction Scheme. This is because the thresholds for eligibility for all forms of assistance under the current scheme (payment for closure, free permits, or concessional loans for debt refinancing or the purchase of future vintage carbon permits) are based on emissions intensity levels that are set too high to include any NSW coal-fired generators. Macquarie Generation – which will be one of the biggest losers in the country from the introduction of a carbon price - will not be eligible for any assistance.

This treatment of electricity generation will have the probably unintended consequence of benefiting foreign governments who have an ownership interest in Australia's brown coal assets. In particular, Hazelwood and Loy Yang B power stations in Victoria are owned by GDF Suez (which bought out the former owner, International Power, in February 2011) which is 36% owned by the Government of France[6]. A Victorian Government analysis estimates that assistance to those two facilities would be in the order of $2.3 billion in nominal terms or $1.6 billion in net present value terms[7]. This implies that over $800m in nominal terms (or about $570m in net present value terms) will effectively be assistance to the Government of France.

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5 Australian Government (July 2011), *Securing a Clean Energy Future*, pp.116-117.

6 Ownership of GDF Suez shareholder capital as at 31 December 2010 is shown in http://www.gdfsuez.com/en/finance/share-price/shareholder-structure/shareholder-structure/ (downloaded 18/07/2011 3:01 PM). Owners include the Government of France (36%); institutional investors (40%); Groupe Bruxelles Lambert (5%); employee shareholders (3%); and CNP Assurances (1%) which is itself partly owned by another financial organisation controlled by the French Parliament.

7 *Briefing Note: Clean Energy Future Package – High level impacts on Victorian energy markets*, Brief prepared by ACIL Tasman for the Victorian Department of Primary Industry, 12 July 2011, p.9.

This is not an argument against excluding foreign ownership, but rather an argument for even-handed treatment of Australian publicly owned generators. The long-standing principle of competitive neutrality between private and public assets, which has underpinned much of the structural reforms in Australia over the past two decades, should apply in either direction.

5.1.2 Tax Revenues

Previous work by Access Economics for the Council for the Australian Federation

Analysis previously done by Access Economics for the Council for the Australian Federation (CAF) in May 2009[8] (based on the CPRS) estimated that among state tax revenue sources, payroll taxes and property taxes would be most adversely affected by the CPRS. This result was based on Access' modelling of economy wide impacts, and Access' assumptions regarding the responsiveness of specific state taxes to changes in macro variables[9] and relative prices.

Access assumed that movements in prices and wages would tend to affect revenue to a greater degree than outlays. The study estimated that under a CPRS, declines in state taxes would occur due to lower economic activity, employment and wages growth. In particular:

- payroll tax was assumed to respond to employment and wages such that a 1.0 percent fall in either variable would cause a 1.12 percent decrease in payroll tax relative to the baseline.
- a 1.0 percent fall in house prices would cause a 1.57 percent decline in land tax and a 1.40 percent fall in conveyancing duty relative to the baseline.

Access projected that NSW tax revenues would be reduced by $200m after two years of the CPRS.

Access' results on state own-source tax revenues were a consequence of the assumed high responsiveness to macro variables (i.e., high elasticities) rather than from larger negative economic impacts (which were similar in magnitude to the Commonwealth's carbon tax estimates). NSW Treasury regards these elasticities as being large. The Access study acknowledged that "*...the elasticities for the various revenue streams for various line items for the key economic variables may be zero*" (p.42), highlighting the margin of uncertainty around the estimates and the potential criticism that Access' estimated impacts were too high.

NSW Treasury estimates

Commonwealth modelling does not provide state-specific employment impacts, which are a key determinant of impacts on major state taxes.

Modelling by Frontier Economics for the NSW Treasury showed a reduction in the annual rate of employment growth of around 0.1 percent per annum, and a reduction in growth of real Gross State Product (GSP) of around 0.15 percent per annum as a result of the introduction of the carbon tax. Frontier's modelling is done in real terms, but revenue reflects nominal aggregates. For this reason, the Commonwealth's CPI impact (a one off increase of 0.7 percent in 2012-13) was used for the estimates described below. No changes are assumed for nominal wages growth.

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8 Access Economics, *Impact of CPRS – Fiscal Report*, May 2009.

9 For example, some drivers of state taxes assumed in the Access study included wages and employment (driving payroll taxes); non-energy prices (driving some stamp duties); house prices (driving land taxes and conveyancing duty); and the gross domestic product deflator (driving GST revenue, gambling revenue, motor vehicle and insurance taxes).

It should be noted that a carbon price may produce offsetting impacts on state tax revenue. While a reduction in economic activity can be expected to reduce the tax base and thereby reduce revenue, many revenue sources are CPI-indexed and would be expected to increase some tax revenues. The impacts outlined below are only partial.

Based on the assumptions above, some estimated impacts on tax revenue include:

- Payroll tax - a reduction of $23 million in 2012-13, $32 million in 2013-14 and $42 million in 2014-15. The reduction of $97 million over the three years to 2014-15 includes (-)$29 million from an increase in the threshold, which is indexed to the CPI.
- GST revenue is up around $209 million over the three years to 2014-15 allowing for both volume and price effects – $82 million in 2012-13, $69 million in 2013-14 and $57 million in 2014-15.

Indicative impacts have been estimated for the following charges which are indexed to the CPI:

- Vehicle weight tax - up around $17 million over the three years to 2014-15.
- Motor vehicle stamp duty - up around $15 million over the three years to 2014-15.

The impact of other charges which are also adjusted periodically in line with the CPI (e.g. parking space levy, health insurance levy, fines and drivers' licences) have not been estimated, as they are relatively minor.

No estimate has been made of transfer duty or land tax, as it is not obvious at this point how the carbon tax would affect these revenues. However, if it is assumed that adverse confidence effects led to a 0.5 percent reduction in the growth rate of transfer duty in 2012-13, the impact over the three years to 2014-15 would be around (-)$71 million – a reduction of $21m in 2012-13, $23m in 2013-14 and $27m in 2014-15.

5.1.3 Coal Royalties

It is not expected that the carbon tax would affect international coal exports, so that royalties on these sales would be unaffected until export prices start to be impacted by global abatement actions. Domestic sales of coal could be reduced if electricity generators reduce their demand for coal. Domestic sales to power stations represent over 20 percent of total NSW coal sales[10].

Coal consumed by power stations will be broadly proportional to the energy that they produce. Whilst the Commonwealth's modelling report (chart 5.31) contains projections of the changes to total installed generating capacity, there is no equivalent information on changes to the expected energy output from the coal fired power stations that remain in service. This information will likely be contained in the consultants' reports that the Commonwealth is yet to release.

Whilst we do not have sufficient information to estimate the reduction in coal that will be used by generators, a 10 percent reduction in domestic coal demand is estimated to reduce coal royalties by around $11 million in 2012-13.

The Access study for CAF estimated a fall in NSW coal royalties of $181m after two years of the CPRS. This reflects a combination of reduced coal production and lower prices. NSW Treasury does not expect either such impact to occur after two years of the carbon tax.

[10] Summary of NSW Coal Statistics at http://www.dpi.nsw.gov.au/minerals/resources/coal/summary-of-nsw-coal-statistics

5.2 Expenditure

5.2.1 Electricity price impacts for NSW government entities

The direct impacts of a carbon price on the Budget are likely to be most immediately felt via increases in electricity prices faced by agencies. All NSW general government agencies are required to purchase energy under the NSW State energy supply agreement (contract 777). (Note: sites classified as 'small users' purchase under a different contract – 776). Government businesses can choose to purchase through this contract, but are not obliged to. Under this contract, the cost of electricity will rise upon the introduction of a carbon price.

The value of this increase will depend upon assumptions around the proportion of the carbon price which is able to be passed on by generators. Some generators are predicting far more limited pass throughs, some as low as 40 percent. The rise in wholesale prices in NSW of 38 percent which the Commonwealth Treasury modelling forecasts, represents around a 62 percent cost pass through, based on an average $40/MWh wholesale price.

Table 2 outlines the range of potential electricity price increases the NSW Government may face under a number of pass through scenarios. Note that this includes all electricity purchased by general government sector agencies and key government businesses. These estimates do not account for the full impact on all NSW government entities, but do cover the substantial majority of NSW Government electricity use.

The NSW government also purchases natural gas, prices of which will rise under a carbon price. However, Treasury estimates this impact to be minimal.

Table 2: Possible impacts of a carbon price on electricity costs of NSW agencies

	MWh per annum	Full pass through ($m 2010)*	40% pass through*	80% pass through*	Based on Commonwealth Treasury estimate#
777	1,560,000	$38.0	$15.2	$30.4	$23.7
776	220,000	$5.4	$2.2	$4.3	$3.3
Rail Corp	780,000	$19.0	$7.6	$15.2	$11.9
Sydney Water	357,000	$8.7	$3.5	$7.0	$5.4
Total	2,917,000	$71.1	$28.5	$56.9	$44.3

* Note that all the pass through columns relate to the 2012-13 impact of a $23 carbon price – the Commonwealth Treasury impact refers to a price rise over the period in 2013-17, which they expect to be concentrated in 2012-13.

The Commonwealth Treasury modelling forecasts that wholesale electricity prices in NSW will rise by around 38% over the period from 2013-2017, translating to a 9% rise in retail prices for NSW (and 10% for all of Australia) (Chapter 5, *Strong Growth, Low Pollution*, pp.111-112). The estimates in this column are calculated on an assumed base wholesale price of $40/MWh.

5.2.2 Other impacts on NSW Government expenditure

Recurrent

Recurrent expenditure could increase to the extent that the carbon tax impacts on the prices of the goods and services the Government purchases. The Commonwealth's projected increases in the CPI suggest a cost for the NSW Government of around $50 million a year, not including the direct impacts on electricity purchase costs.

Changes in demand for Government services will also impact on government expenditure. Earlier work by Access Economics for the Council for the Australian Federation (CAF) in May 2009[11] (based on the CPRS) estimated that the most significant impacts of a carbon price on NSW expenditure would likely be increases in health and rail transport. Increases of $190m for each of these were projected after two years of the CPRS. This relatively large impact critically depended on:

- Access' modelling of the economy wide impacts
- Access' assumptions regarding the responsiveness of the demand for government services to changes in macro variables[12] and relative prices, and
- specific design features of the CPRS which no longer apply in the Commonwealth package of 10/7/11.

Access surmised that under the CPRS the cost of private transport would increase relative to *public transport* with a consequent $190m cost impact for the NSW Government. But this will not occur under the new policy, because while a carbon price will not directly apply to the price of fuel at the petrol bowser[13], it will apply to domestic aviation, domestic shipping, rail transport and non-transport use of fuels. This could increase the cost of public transport relative to private transport if the cost of a carbon tax were fully passed through.

In relation to *community health* – the Access report surmised that demand for community health services would significantly increase as petrol prices (individual travel costs) increased under the CPRS. Even if this were the case, Access's projected $190m cost increase, based on such a behavioural response, is very speculative. However, it will not be the case under the new policy, because petrol prices for households are being protected from increases due to the carbon tax.

A carbon price could also increase budget pressures in relation to energy concessions. Energy concessions under NSW schemes for low income households and households experiencing difficulties paying their power bills are not directly related to energy prices. However, as electricity prices increase there will be pressure to increase the level of concessions and relax eligibility criteria.

Capital

It is conceivable that a carbon price may affect the cost of inputs for the Government's capital program. However, given the differences in projects comprising the $16 billion infrastructure program, it is not possible to quantify the impact of a carbon price on the program without heavy qualifications. Ultimately, the impact of a carbon price on the state infrastructure program would depend on:

- Cost pass-through - the extent to which a carbon price is passed through to increases in the manufacturing costs (including electricity and fuel) of inputs to the construction sector.

[11] Access Economics, *Impact of CPRS – Fiscal Report*, May 2009.

[12] For example, the Access Economics analysis assumed that demand for health and welfare services increase as employment declines; and that transport services are sensitive to petrol prices (demand increases for public transport as petrol prices increase) and employment.

[13] Household and small business use of light on-road vehicles will not face a carbon price on their fuel, but from 2012-13 some businesses will face an effective carbon price on their use of transport fuels through reduced fuel tax credits. Fuel tax credit arrangements will apply to the heavy on-road vehicle industry from 2014-15.

- Input substitution - the extent to which construction firms are able to offset increases in manufacturing cost (due to a carbon price) by adjustments in other inputs - e.g., a construction firm faced by increases in the cost of materials may offset these increases with reductions in the cost of other inputs (e.g., minimising labour costs or adopting more energy-efficient manufacturing processes).
- Cost structure - the share of total capital cost accounted for by those inputs that are most heavily affected by a carbon price. For instance, some projects have a relatively higher share of project planning costs which are labour intensive and would be less affected by a carbon price; residential construction uses a larger proportion of manufactured materials and a smaller proportion of electricity inputs than non-residential construction and heavy civil engineering construction; roads may have a significantly different input cost profile from that of a water supply network; and so on.
- Alternative modes of delivering capital services – for example, the RTA makes extensive use of subcontracting, whose carbon price-dependent inputs would not be separately identifiable and may differ from the RTA's own carbon price-dependent cost profile; an agency may lease its accommodation, reflecting a different carbon price impact from that of another agency which may opt to construct the asset itself.

Due to the complexities and the difficulty of predicting what may be offsetting impacts of a carbon price on the State's capital program, NSW Treasury has not quantified the impacts on NSW capital spending. However, Australia-wide input-output data suggest the realistic limits of what one may expect those impacts to be. The production cost of a number of manufacturing outputs that are used in construction (the major ones being electricity and fuel supply, wood and ceramic products, cement, concrete, plaster, iron and steel) could potentially be affected by a carbon price. Australian Input-Output tables for 2006-07 suggest that these manufacturing inputs to construction account for an average 9 cents for every dollar of construction output. Therefore, any increase in cost due to a carbon price would likely affect only this proportion (and not 100%) of total capital expenditure.

5.2.3 Other expenditure risks

Expenditure pressures due to termination of NSW GGAS

The Commonwealth assumes the NSW GGAS scheme will cease upon commencement of the national carbon price "in line with NSW Government policy" (Commonwealth modelling report, p140). Under the CPRS, the Commonwealth had agreed to a compensation package valued at up to $130 million for GGAS participants. This included up to $50 million for scheme participants who would lose their certificate income stream under the shift away from the GGAS baseline and credit model, and $80 million for holders of unused NGAC certificates. Based on recent trading prices of $3.00-$3.50 for NSW Greenhouse Gas Abatement Certificates (NGACs), the value of unused certificates is now around $70-$80 million. .

The Commonwealth has not made any provision for compensation to GGAS participants under the current carbon tax proposal. NSW has no legal obligation to provide compensation to GGAS participants arising from the closure of the scheme. However, without Commonwealth compensation the NSW Government could be expected to provide compensation to scheme participants from the State budget. This could represent a substantial cost in the event that there are significant numbers of unacquitted NGACs when the scheme is closed, or if there are a significant number of existing projects undertaken on the presumption that GGAS would continue until 2020.

There are currently around 23 million unused NGACs in the GGAS registry. Work is currently underway to assess the possible magnitude of impacts of the carbon price policy on GGAS participants, and the estimate of possible compensation claims may be refined further.

Expenditure pressures due to termination of NSW Energy Efficiency Scheme (EES)

The Commonwealth Government has indicated that it will establish a national energy savings certificate, or 'white certificates' scheme. A timeframe for this work has not been outlined, but the Commonwealth has indicated that it would expect the national scheme to replace existing state schemes, including the NSW Energy Savings Scheme (ESS)[14]. If so, the certificates created under the NSW scheme must be recognised at their existing value under the national scheme.

As at 31 May 2011 there were about 453,000 live certificates yet to be surrendered under the ESS. At a rate of $31 (the reported price on forward trades for these certificates as at January 2011), these certificates would be valued at up to $14 million. Activities accredited under the NSW scheme must also be eligible under the national scheme. If these criteria were not met, the NSW Government may come under pressure to compensate NSW ESS participants. However, like GGAS, NSW has no legal liability to provide this compensation.

[14] Australian Government, *Securing a Clean Energy Future* (main report), July 2011, p82.

Appendix 1:

Price Impacts: Differences between analyses by IPART (March 2010) and Commonwealth (July 2011)

The Commonwealth states that "household retail electricity prices are projected to increase by 10 percent on average….over five years after carbon pricing starts." (*Strong Growth, Low Pollution: Modelling a Carbon Price*, p.111). The detail that supports this conclusion has not been released.

Previous work by the Independent Pricing and Regulatory Tribunal (IPART) suggests a larger impact on retail electricity prices. In the March 2010 final report [15]*Review of regulated retail tariffs and charges for electricity 2010-2013*, IPART estimated the impact of the then CPRS on retail electricity prices in NSW. The price impacts were based on the modelling published by the Commonwealth Treasury at the time, which was going to cap the carbon price in the first year of operation in 2011-12 at $10/tCO2, and then revert to a market price estimated at $26/tCO2 in real terms ($2009-10) in 2012-13. Based on these carbon prices, IPART estimated the following impact of a carbon price on customers' annual electricity bills (Table A-1).

The Commonwealth announced a carbon price of $23/t CO2-e in 2012-13. Table A-2 shows the prorated changes in customers' annual electricity bills in 2012-13 assuming a carbon price of $23/tCO2 from a 2010-11 bill and a 2011-12 bill for each retailer.

Forecasts for retail electricity prices are based on wholesale energy prices, transmission and distribution costs and retail margins. It should be noted that after the IPART 2010 estimates were done, conditions in the electricity market changed over the last 18 months, including the energy reform transactions in NSW, which could result in changes to generators' bidding behaviour and the outcomes for electricity wholesale prices.

The Commonwealth policy envisions a fixed carbon price over three years, starting at $23/tonne CO2-e in 2012-13, which increases in nominal terms by 5% annually (or by 2.5% above inflation) until July 1, 2015. The carbon price is forecast by the Commonwealth to reach $29/tonne CO2-e by 2015-16 - the first year of the flexible price period. This means that retail electricity prices would continue to increase beyond 2012-13 as a result of the carbon tax.

In its modelling report, the Commonwealth estimated that average household electricity prices would increase by 10% over 2013-17 under the core policy scenario and 17% under the high price scenario. IPART 2010 analysis – on which Tables A-1 and A-2 are based - estimated that annual average household electricity bills would be likely to increase by 15%-22% in 2012-13 as a result of a $26 carbon price under the CPRS.

[15] IPART, *Review of regulated retail tariffs and charges for electricity 2010-2013*, Final Report March 2010.

Table A-1: IPART estimates of impact of a $26 carbon price on electricity bills (sourced from IPART's *Regulated Retail Tariffs and Charges for Electricity 2010-2013*, March 2010)

EnergyAustralia - IPART Indicative increases in annual bills for typical customers (nominal $)

		2010-11 bills	2012-13 bills			
		No carbon	No carbon	With carbon	Carbon price impact	
				$26/tCO2*	$	%
Residential						
Low usage	(3,000 kWh per year)	$ 739	$ 910	$ 1,074	$ 164	18%
Medium usage - no controlled load^	(5,600 kWh per year)	$ 1,229	$ 1,515	$ 1,788	$ 273	18%
High usage with controlled load^	(11,000 kWh per year)	$ 2,215	$ 2,730	$ 3,221	$ 491	18%
Business						
20 MWh per year		$ 4,882	$ 6,018	$ 7,101	$ 1,083	18%
40 MWh per year		$ 10,376	$ 12,790	$ 15,091	$ 2,301	18%
80 MWh per year		$ 21,364	$ 26,334	$ 31,072	$ 4,738	18%

Integral Energy - IPART Indicative increases in annual bills for typical customers (nominal $)

		2010-11 bills	2012-13 bills			
		No carbon	No carbon	With carbon	Carbon price impact	
				$26/tCO2*	$	%
Residential						
Low usage	(3,000 kWh per year)	$ 831	$ 930	$ 1,135	$ 205	22%
Medium usage - no controlled load^	(5,600 kWh per year)	$ 1,372	$ 1,537	$ 1,876	$ 339	22%
High usage with controlled load^	(11,000 kWh per year)	$ 2,279	$ 2,552	$ 3,115	$ 563	22%
Business						
20 MWh per year		$ 4,249	$ 4,759	$ 5,807	$ 1,048	22%
40 MWh per year		$ 8,411	$ 9,420	$ 11,496	$ 2,076	22%
80 MWh per year		$ 16,735	$ 18,743	$ 22,873	$ 4,130	22%

Country Energy - IPART Indicative increases in annual bills for typical customers (nominal $)

		2010-11 bills	2012-13 bills			
		No carbon	No carbon	With carbon	Carbon price impact	
				$26/tCO2*	$	%
Residential						
Low usage	(3,000 kWh per year)	$ 1,062	$ 1,333	$ 1,540	$ 207	16%
Medium usage - no controlled load^	(5,600 kWh per year)	$ 1,694	$ 2,128	$ 2,457	$ 329	15%
High usage with controlled load^	(11,000 kWh per year)	$ 2,735	$ 3,435	$ 3,967	$ 532	15%
Business						
20 MWh per year		$ 5,993	$ 7,529	$ 8,694	$ 1,165	15%
40 MWh per year		$ 11,565	$ 14,528	$ 16,776	$ 2,248	15%
80 MWh per year		$ 22,708	$ 28,526	$ 32,941	$ 4,415	15%

*Based on CPRS 5% reduction as per IPART's analysis in March 2010

^Control load is (mostly) off peak hot water heater

Table A-2: Indicative increases in annual electricity bills for typical customers (Prorated from $26/t CO2 IPART estimates 2010)

EnergyAustralia - IPART Indicative increases in annual bills for typical customers (nominal $)

		2010-11 bills	2012-13 bills			
		No carbon	No carbon	With carbon	Carbon price impact	
				$23/tCO2*	$	%
Residential						
Low usage	(3,000 kWh per year)	$ 739	$ 910	$ 1,055	$ 145	16%
Medium usage - no controlled load^	(5,600 kWh per year)	$ 1,229	$ 1,515	$ 1,757	$ 242	16%
High usage with controlled load^	(11,000 kWh per year)	$ 2,215	$ 2,730	$ 3,164	$ 434	16%
Business						
20 MWh per year		$ 4,882	$ 6,018	$ 6,976	$ 958	16%
40 MWh per year		$ 10,376	$ 12,790	$ 14,826	$ 2,036	16%
80 MWh per year		$ 21,364	$ 26,334	$ 30,525	$ 4,191	16%

Integral Energy - IPART Indicative increases in annual bills for typical customers (nominal $)

		2010-11 bills	2012-13 bills			
		No carbon	No carbon	With carbon	Carbon price impact	
				$23/tCO2*	$	%
Residential						
Low usage	(3,000 kWh per year)	$ 831	$ 930	$ 1,111	$ 181	19%
Medium usage - no controlled load^	(5,600 kWh per year)	$ 1,372	$ 1,537	$ 1,837	$ 300	20%
High usage with controlled load^	(11,000 kWh per year)	$ 2,279	$ 2,552	$ 3,050	$ 498	20%
Business						
20 MWh per year		$ 4,249	$ 4,759	$ 5,686	$ 927	19%
40 MWh per year		$ 8,411	$ 9,420	$ 11,256	$ 1,836	19%
80 MWh per year		$ 16,735	$ 18,743	$ 22,396	$ 3,653	19%

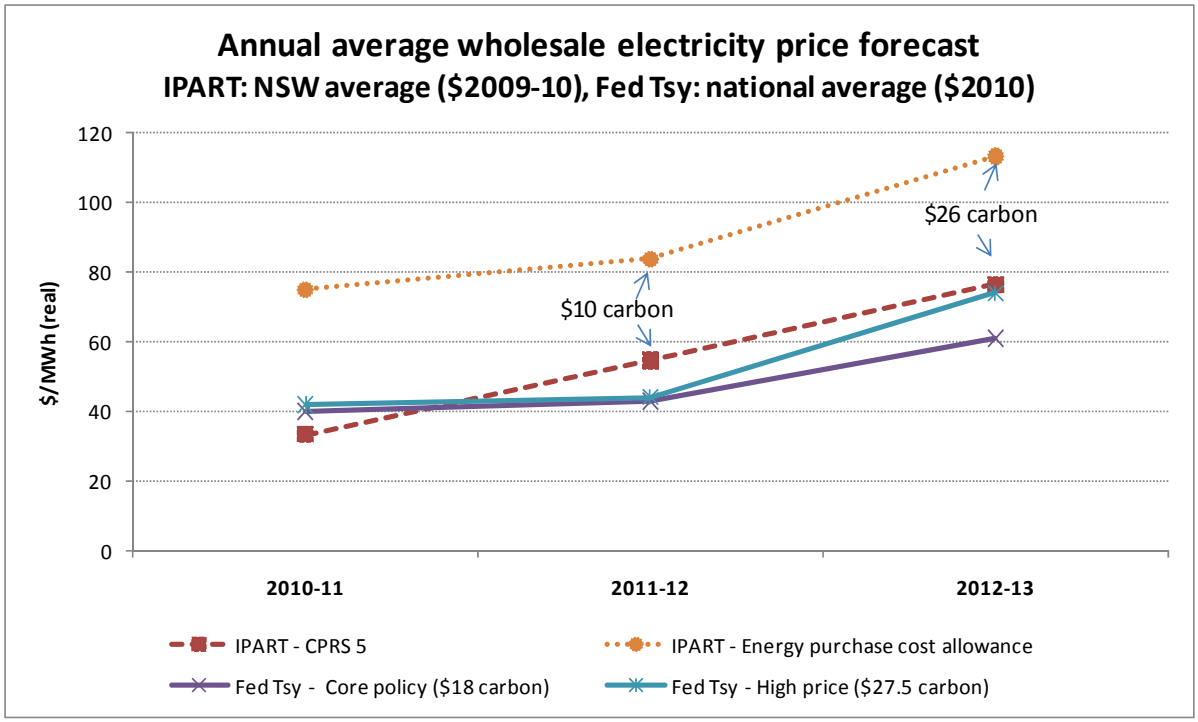
Country Energy - IPART Indicative increases in annual bills for typical customers (nominal $)

		2010-11 bills	2012-13 bills			
		No carbon	No carbon	With carbon	Carbon price impact	
				$23/tCO2*	$	%
Residential						
Low usage	(3,000 kWh per year)	$ 1,062	$ 1,333	$ 1,516	$ 183	14%
Medium usage - no controlled load^	(5,600 kWh per year)	$ 1,694	$ 2,128	$ 2,419	$ 291	14%
High usage with controlled load^	(11,000 kWh per year)	$ 2,735	$ 3,435	$ 3,906	$ 471	14%
Business						
20 MWh per year		$ 5,993	$ 7,529	$ 8,560	$ 1,031	14%
40 MWh per year		$ 11,565	$ 14,528	$ 16,517	$ 1,989	14%
80 MWh per year		$ 22,708	$ 28,526	$ 32,432	$ 3,906	14%

*Pro rated from $26/tCO2 in IPART's analysis in March 2010

^Control load is (mostly) off peak hot water heater

The figure below shows a number of differences in the underlying assumptions between IPART (2010) and the Commonwealth's analyses (July 2011).



The reasons for these differences include:

Firstly, the annual average wholesale electricity price forecasts are different:

- The IPART forecasts are based on the NSW average price while the Commonwealth forecasts are a national average.
- The IPART forecasts are consistently higher than the Commonwealth forecasts in 2011-12 and 2012-13 in scenarios with and without carbon.
- The differences between the two estimates are much less under the Commonwealth high price scenario, where the carbon price is at $27.5 in 2012-13.

Secondly, household electricity prices are based on the energy purchase cost allowance rather than the wholesale electricity price:

- IPART determined an energy purchase cost allowance for each of the NSW retailers based on the higher of the long run marginal cost (LRMC) of electricity or the market-based energy purchased cost.
- Both the LRMC and energy-based purchase cost are higher than the wholesale electricity price because -
    - The LRMC takes into account the generators' fixed costs in the long run while the wholesale electricity price merely reflects the generators' short run marginal cost (mainly coal).
    - The energy-based purchase cost includes a volatility premium on top of the wholesale electricity price.

- The energy purchase cost allowance is derived from the regulated load for each of the retailers. As the shape of a typical regulated load is generally peakier than the average NSW load due to households' electricity consumption patterns, and the cost for retailers to hedge such a load is higher than the average NSW wholesale price.

In addition to the above factors, differences in carbon cost pass-through may also account for some of the difference in retail price impacts, although this cannot be confirmed because the Commonwealth report does not explicitly report its carbon cost pass-through assumptions. However, it is possible to deduce this through indirect means. The Commonwealth report states that average wholesale electricity prices in NSW will increase by 38% during the period 2013 to 2017 (Table 5.14, p.111 of modelling report). Based on an assumed wholesale price of $40/MWh, the 38% increase in wholesale prices would imply a cost pass-through in the order of 62%.

On the other hand, IPART estimates of March 2010 were based on Frontier modelling which assumed higher rates of carbon cost pass-through. These rates increase from 96% in 2012 to 111% in 2013 under the market based approach, and are in the order of 80% in 2012 and 77% in 2013 under the LRMC approach. Frontier's report to IPART noted that a high pass-through would typically be expected at the beginning of an emissions trading scheme but where new investment has not yet come into the National Electricity Market in response to that scheme (Frontier Economics, *Energy Purchase Costs: Final Report to IPART*, March 2010, p.80).

To the extent that the latest Commonwealth policy package no longer envisions an immediate introduction of emissions trading, it is possible that the assumption of a very high carbon cost pass-through (previously expected in the early years of a CPRS) may be reduced or postponed to later years when the scheme transitions to a flexible price regime.