



The Carbon Price and the Cost of Living

Assessing the impacts on consumer prices and households



Key findings: The Carbon Price and the Cost of Living

- The proposed carbon price, starting at \$23 per tonne, could result in an increase in consumer prices of 0.6% in 2012/13, and a second impact of up to 0.1% in 2015/16, assuming full cost pass through of the carbon price liability. These results are slightly lower than the impacts of 0.7% and 0.2% estimated by Treasury (2011a).
 - These results are considered 'upper bound' estimates, implying actual impacts on prices could be smaller than 0.6-0.7%, with actual impacts depending on the degree to which costs are passed through to prices over time.
- The impact of the carbon price on consumer prices is around one quarter of the 2.5% impact on consumer prices of introducing the GST, and smaller than the impact of drivers of other major events that led to an increase of consumer prices over the last two decades, such as the trade and exchange rate impacts of the mining boom (2007/08) which had a 1.6% impact on consumer prices.
 - Unlike most major recent consumer price impacts, other than the GST, the introduction of a carbon price will be accompanied by assistance to households through tax cuts and increases in government benefit payments.
- Estimated impacts on electricity prices are similar to other studies. While the carbon price impact on
 electricity prices is smaller than the impact of recent increases network costs, the carbon price adds to
 these, continuing recent trend price increases. This highlights the importance of household energy
 efficiency, and of minimising increases in network costs.
 - The impacts on food prices are likely to be small (around 0.5% on average), and less than historical variability in food prices over time.
- We estimate that the carbon price will result in an overall increase in expenditure of \$9.10 per week in 2012-13, less than the Treasury estimate of \$9.90 per week. This estimate is based on applying the price changes to the latest household expenditure data. Price impacts are made up of increases of \$3.20 in electricity and gas costs, \$1.20 in food costs, and \$4.70 in other costs (such as clothing, recreation costs).
- Households with higher incomes and expenditure are estimated to face higher dollar increases in costs, but lower impacts as a share of expenditure. This is because low income households spend a larger share of their income on electricity and gas, which have larger price impacts from the carbon price.
 - The carbon price impact on low income households is equivalent to 0.8% to 0.9% of expenditure across all low income households, ranging from \$4.30 per week for a single adult to \$8.60 per week for couples with dependent children (reflecting different expenditure levels).
 - For high income households the carbon price impact is typically equivalent to 0.6% to 0.8% of expenditure, ranging from \$6.60 per week for a high income single adult to \$17.90 per week for a high income couple with dependents.
- Household assistance is focused on low and moderate income households, with middle income households typically receiving assistance that offsets most but not all of the impact of the carbon price.
 - Low and moderate income households receive significant assistance, generally outweighing the average price impact for these households by a significant margin.
 - The balance between impacts and assistance for middle income households is sensitive to the specific
 circumstances of households. In most of the cases examined, middle income households receive
 assistance that is larger than the average impact for that household type. However, in some cases,
 middle income households examined are eligible to receive assistance equivalent to 60-95 percent of
 the carbon price impact.
 - High income households typically receive only limited assistance under the government's policy.
- Overall, the analysis finds that the projected impacts of the carbon price fall well within the range of recent historical experience of changes in consumer prices and household cost of living, and that most households will receive assistance that offsets all or a significant portion of the impact of the carbon price.

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Summary Report: The Carbon Price and the Cost of Living

This study provides an independent analysis of the impacts of the Government's proposed carbon price on the cost of living for Australian households. The main goals of the report are to:

- provide an independent analysis of the economic impacts of the introduction of a carbon price;
- outline the methods and assumptions used in the analysis;
- bring together estimates of price impacts and announced government assistance to households; and
- put the projected impacts into historical context so that readers are able to better evaluate their significance.

The project provides an in-depth and transparent analysis of one aspect of the economic analysis undertaken by Treasury (2011a, 2011b) with other government agencies. While the broad approach is similar, some data and assumptions are likely to differ, and so results are also likely to be different – particularly for specific sectors. The study does not take account of any benefits that might arise from reducing greenhouse emissions, such as avoided likely or potential storm damages, lost agricultural production, or increases in food prices caused by more extreme weather events.

The study uses input-output analysis to estimate the increase in prices associated with the introduction of the carbon price, and applies these price increases to the latest available expenditure data from the Household Expenditure Survey conducted by the Australian Bureau of Statistics (ABS 2011). More details are provided in the full report (Hatfield-Dodds et al 2011).

Assessing the impact of the carbon price on consumer prices

To assess the impact of the carbon price, the study calculates the economy-wide carbon price liability, models how this flows through to different sectors, and calculates how this will increase consumer prices.

The Government's carbon price package would impose a \$23 price per tonne of carbon across a wide range of energy sources and industrial emissions. The carbon price does not apply to passenger vehicles and light transport vehicles, or to off-road fuel use by the agriculture, forestry and fishing industries. While the carbon price is only applied to around 500 large carbon emitting firms, the analysis assumes this cost is passed though to their customers (i.e. other firms), and through the economy to consumers.

The analysis finds that the impact on prices in most sectors will be small, even assuming 100% pass through of the carbon price to final consumers. This is because the economic value of the carbon price is very small in relation to the economy as a whole: total value of carbon permits is estimated at around \$8.5 billion in the first year, less than 0.6% of the \$1,550 billion projected value of the economy in 2012-13.

Electricity and gas prices rise the most because these products are highly emissions intensive.
 Electricity prices rise by around 10%, and gas prices by around 5%, relative to what they would be without a carbon price.

Prices in all other sectors rise by around one third of a percent (0.3-0.4%), on average, as shown in Figure ES 1.

12.0 10.0 8.0 per cent 6.0 4.0 2.0 0.0 Household trunishings & .. Miscellare out Book & service's Claring of odtweet , alcoholic beverages Acondicideretales Housing

Figure ES 1: Estimated increases in the prices of consumer goods and services

Note: Assumes full cost pass through to prices. Source: AECOM and CSIRO calculations.

Other economic modeling suggests the revenue from a carbon price will remain small relative to the economy over time, with increases in carbon prices being offset by reductions in emissions. Related economic analysis also suggests that global action to retain temperature increases to 2°C or less would provide net economic benefits (see Stern 2008, Nordhaus 2010, and Garnaut 2011).

Overall, the carbon price is estimated to increase consumer prices by 0.6% in 2012-13, with a potential second impact of 0.1% in 2015-16 (including the impact of the proposed extension the carbon price to trucks and heavy transport in this year).

- These estimates are slightly lower than the official Australian Government estimate of 0.7% and 0.2% in 2012-13 and 2015-16.
- Actual impacts could be lower than these estimates, in the same way that the estimated impact of the GST was 2.75% before it was introduced, but analysis afterwards found the impact was 2.5%.

This overall impact is made up of the effect of different price rises, as shown in Figure ES 2 and Table **ES 1**.

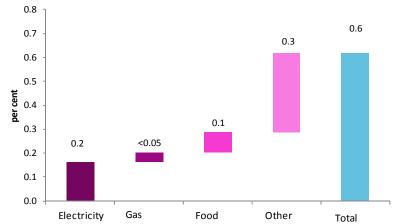


Figure ES 2: Components of the price rise from the carbon price, 2012-13

Note: Assumes full cost pass through to prices. Source: AECOM and CSIRO calculations.

- Electricity and gas account for around one third of the impact on consumer prices, as shown in Figure ES.2. This reflects the impact of the price increase for electricity and gas, multiplied by their share of total household expenditure. (Average expenditure on electricity and gas is \$36 per week, equal to 2.5% of total household expenditure of \$1,422 per week.)
- Food prices rise by around half a percent (0.5%), accounting for one sixth of the effect on consumer prices, because food accounts for around 15% of total expenditure.
- Other prices rise by a third of one percent (0.3%), but make up around half the total impact on the consumer price index (representing the average household consumption bundle). This is because this small price increase applies to expenditure of around \$1,150 per week, accounting for more than 90% of average household spending on goods and services.

Table ES 1: Estimated household expenditures and price increases, 2012-13

	Household expenditure	Price increase	Contribution to increase in consumer price index
Electricity	27.90	10.0%	0.2%
Gas	7.60	5.3%	< 0.05%
Food	234.90	0.5%	0.1%
Other	1,151.60	0.3%	0.3%
Total impact	1,421.90	0.6%	0.6%

Notes: Assumes full cost pass through to prices. Source: AECOM and CSIRO calculations

Putting these impacts in historical context

Comparing the projected overall impact on consumer prices to other events that have contributed to annual inflation outcomes increases suggests that the carbon price impact is likely to be smaller than the drivers of other major events that affected consumer prices over the last two decades, including the introduction of GST, the trade and exchange rate effects associated with the mining boom before the GFC (2007/08) and higher food prices associated with floods and storm damage in 2005/06.

The carbon price impact on retail electricity prices is noticeable, continuing recent trend increases in electricity prices, but the size of the impact is not as large recent increases in network costs. The projected carbon price impact is around half to two thirds of the anticipated increase in network costs from 2010-11. Nevertheless, the carbon price will add to electricity prices, highlighting the importance of household energy efficiency, and of minimising growth in peak demand and increases in network costs.

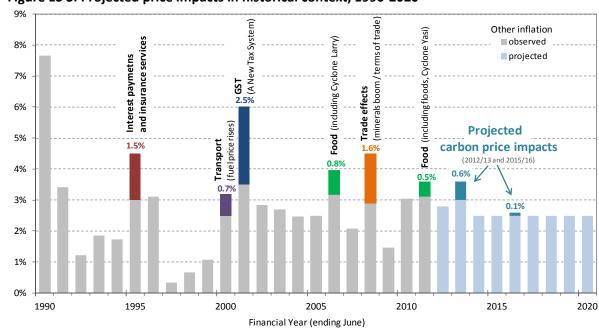


Figure ES 3: Projected price impacts in historical context, 1990-2020

Annual inflation

Notes: Analysis of detailed ABS inflation data identifies the major expenditure categories that have driven inflation in each year with inflation of 3.5% or more since 1991. This identifies five primary contributions to inflation, ranging from 0.5% to 2.5%, with impacts of 1.5% or more occurring every five to seven years over the period. The analysis also identifies a 'secondary contribution' to inflation from increases in petrol prices, and includes one of these years as an additional comparison, although it was not a primary inflation driver and occurred in a year where inflation was below 3.5%. In this report the term inflation is used to include a one off impact on the price level but does not necessarily imply a change in the overall rate of inflation. The findings of the study suggest there will be no impact on the rate of inflation apart from the one off impacts identified in 2012/13 and 2015/16.

Source: Calculated from ABS 2011a, with CSIRO and AECOM carbon price impacts, and GST impact from Treasury (2001)

The impact of the carbon price on food prices is also smaller than historical variations in food prices, particularly the prices of meat, fruit and vegetables, which are influenced by weather events such as floods, storms and droughts – as shown in Figure ES 4 below.

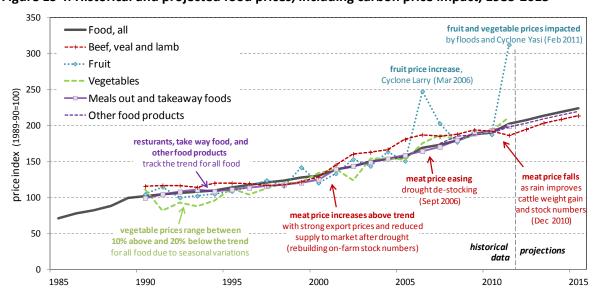


Figure ES 4: Historical and projected food prices, including carbon price impact, 1985-2015

Source: Calculated from ABS (2011a), Adams (2011), and sources for Figure 11 in the main report.

Impacts on household cost of living

Applying these price changes to the latest household expenditure data, from 2009-10, we estimate that the carbon price will result in an increase in expenditure of \$9.10 per week in 2012-13 for an average Australian household. This is made up of increases of \$3.20 in electricity and gas costs, \$1.20 in food costs, and \$4.70 in other costs. This overall impact is less than the official Government estimate of \$9.90 per week, but a little more than the \$8.90 estimated by NATSEM, as shown in **Table ES 2**. (The official Government estimates are based on 2003-04 expenditure data, which was the most recent available at the time.)

Table ES 2: Summary of estimated average household impacts and assistance

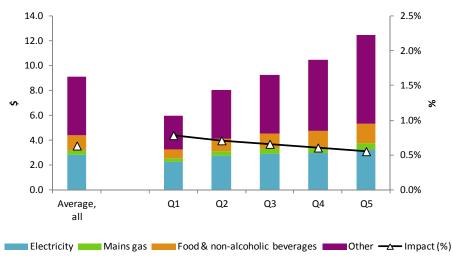
\$ per week, 2012-13	AECOM and CSIRO	Australian Government	Phillips and Taylor (NATSEM)
Electricity	\$2.80	\$3.30	not reported
Gas	\$0.40	\$1.50	not reported
Food	\$1.20	\$0.80	not reported
Other	\$4.70	\$4.30	not reported
Total impact	\$9.10	\$9.90	\$8.50
Financial assistance	not estimated	\$10.10	\$10.90

Source: AECOM and CSIRO calculations, Australian Government (2011), Philips and Taylor (2011)

The full report calculates impacts for low, moderate, middle and high income levels across four main household types: couples with dependent children, single parent families, couples without dependents, single adults. Results are also presented for senior couples and senior singles, and for all household types across capital cities and non capital cities (referred to as balance of Australia).

Households with higher incomes and expenditure are estimated to face higher dollar increases in costs, but lower impacts as a share of expenditure. This is because low income households spend a larger share of their income on electricity and gas, which have larger price impacts from the carbon price. Low income households also receive proportionally more assistance under the Government's policy package, as discussed below.

Figure ES 5: Impact of a carbon price on weekly expenditure (dollars) and impact as a share of expenditure (%), all households and relative income quintiles, 2012-13



Notes: Quintiles divide households into five qual groups by equivalised income levels, with Q1 the 20% of households with the lowest household income, and Q5 the 20% with the highest income. Source: AECOM and CSIRO calculations.

The carbon price impact on low income households is equivalent to 0.8% to 0.9% across all low income households, ranging from \$4.30 per week for a single adult to \$8.60 per week for couples with dependent children across the households examined (reflecting different expenditure levels).

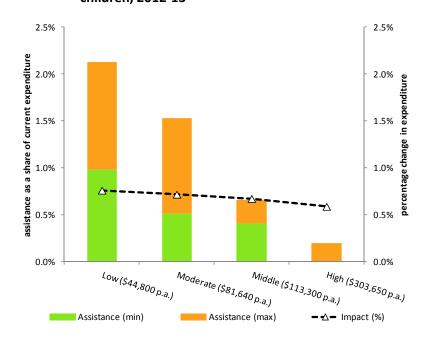
For high income households the carbon price impact is typically equivalent to 0.6% to 0.8% of expenditure, ranging from \$6.60 per week for a high income single adult to \$17.90 per week for a high income couple with dependents.

Assistance to households

The Clean Energy Future package also includes assistance to households, delivered mainly through increases in benefit payments and reductions in personal income tax. This assistance is focused on low and moderate income households, with middle income households typically receiving assistance that offsets most but not all of the impact of the carbon price. This 'assistance gradient' is shown in **Figure ES 6** below for couple families with dependent children, along with the impact of the carbon price.

- Low and moderate income households receive a financial assistance that generally outweighs the average price impact for these households by a significant margin.
- For middle income households, the balance between impacts and assistance is sensitive to their specific circumstances. In most of the cases examined, these households receive more assistance than the average impact for middle income households. In some cases, the middle income households examined would receive assistance equivalent to 60-95 percent of the carbon price impact.
- High income households typically receive limited assistance under the government's policy.

Figure ES 6: Impacts and assistance as a share of expenditure, couple family with dependent children, 2012-13



Notes: 'p.a.' refers to per annum. Source: AECOM and CSIRO calculations.

In addition, households can reduce the impact of the carbon price by reducing their energy consumption, and by buying goods and services that are less emissions intensive. These actions will not reduce the assistance received by households, as assistance is based on income and household characteristics (such as the age and number of children, and eligibility for benefit payments such as the age pension). The potential for changes in energy use and expenditure patterns is not taken into account in the estimates of impacts.

Overall conclusions

Overall, the analysis suggests that:

- the projected impacts of the carbon price are relatively modest, and fall well within the range of recent historical experience of changes in consumer prices and household living costs; and
- most households will receive assistance that offsets all or a significant portion of the cost impact of the carbon price.

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