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CRAWFORD SCHOOL
OF ECONOMICS AND GOVERNMENT

POLICY BRIEFS

Australia's Carbon Price: Good Policy or Not?

Trevor Breusch
Bruce Chapman
Henry Ergas
John Freebairn
Frank Jotzo
David Pearce
Anna Skarbek

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POLICY BRIEFS

Contents

Global temperature trends - beyond reasonable doubt	
Trevor Breusch	1
Climate change policy: the jobs issue	
Bruce Chapman	4
Should we impose a carbon tax?	
Henry Ergas	6
Taxation changes and households	
John Freebairn	8
Australia's carbon pricing scheme: prices, targets and trading	
Frank Jotzo	9
Carbon pricing: some business perspectives	
David Pearce	11
Australia can cut more carbon	
Anna Skarbek	13

About the authors

Trevor Breusch is the Deputy Director of the Crawford School of Economics and Government at the Australian National University. His research interests are varied and include econometric methods and computational tools in econometrics, applied social and demographic research, labour market participation and earnings, and data archives and replication studies. Trevor is a Fellow of the Econometric Society, Chair of the Standing Committee of Australasian Region Econometric Society, Member of the Methodology Advisory Committee of the Australian Bureau of Statistics and member of the ANU Human Research Ethics Committee.

Bruce Chapman is Professor of Economics at Crawford School of Economics and Government at ANU. He has worked directly on many labour market and education policies, such as HECS, Working Nation and the 2010 changes to Youth Allowance, and was a principal economic advisor to the Prime Minister Paul Keating, 1994-96. His research interests include education and labour market economics, income contingent loans, the economics of crime, the economics of cricket, and applied econometrics. He was awarded an Order of Australia (General Division) in 2003 for contributions to economic policy and is currently the President of the Economics Society of Australia.

Henry Ergas is the inaugural Professor of Infrastructure Economics at the SMART Infrastructure Facility at the University of Wollongong. The SMART Infrastructure Facility is a \$61.8 million world-class research and training centre concerned with integrated infrastructure solutions for the future. He is also Deloitte Australia's Senior Economic Adviser. Prior to these concurrent roles, Professor Ergas worked as a consultant economist at NECG, CRA International and Concept Economics. He was also an economist at the OECD in Paris and headed the Secretary-General's Task Force on Structural Adjustment. Since leaving the OECD in 1993, his work has focused on competition policy and regulatory economics.

John Freebairn holds the Ritchie Chair in Economics at the University of Melbourne. He has degrees from the University of New England and the University of California, Davis. Prior to joining Melbourne in 1996, his career has included university appointments at ANU, LaTrobe and Monash, and periods with the NSW Department of Agriculture and at the Business Council of Australia. Professor Freebairn is an applied microeconomist and economic policy analyst with current interests in taxation reform and environmental economics.

Frank Jotzo is Senior Lecturer at Crawford School, Director of the Centre for Climate Economics and

Policy, and Deputy Director of the ANU Climate Change Institute. He was an advisor to the Garnaut Climate Change Review, and has contributed commissioned analysis to Australia's Multi-Party Climate Change Committee. He has consulted for governments and international organisations, and is a lead author of the Fifth Assessment Report by the Intergovernmental Panel on Climate Change.

David Pearce is Executive Director of the Centre for International Economics — a private Australian economic research and advisory firm. He has 23 years experience as an applied economist and has been involved in greenhouse policy analysis for the past 17 years, undertaking a range of analyses for Australian and international governments as well as private firms and business groups. Mr Pearce has extensive international experience, including undertaking projects in Vietnam, China, India, Laos, Indonesia, Sri Lanka, Bulgaria, the Philippines and the Central Pacific.

Anna Skarbek is Executive Director of ClimateWorks Australia. She previously worked in London's carbon markets, as Vice President at Climate Change Capital. Her career has included senior policy adviser for the Victorian Deputy Premier, investment banker at Macquarie Bank and solicitor with Mallesons Stephen Jaques. Ms Skarbek currently sits on the Australian Government's NGO Roundtable on Climate Change and is a director of the Carbon Market Institute, Sustainable Melbourne Fund, Thermometer Foundation for Social Research on Climate Change and Linking Melbourne Authority.

Global temperature trends - beyond reasonable doubt

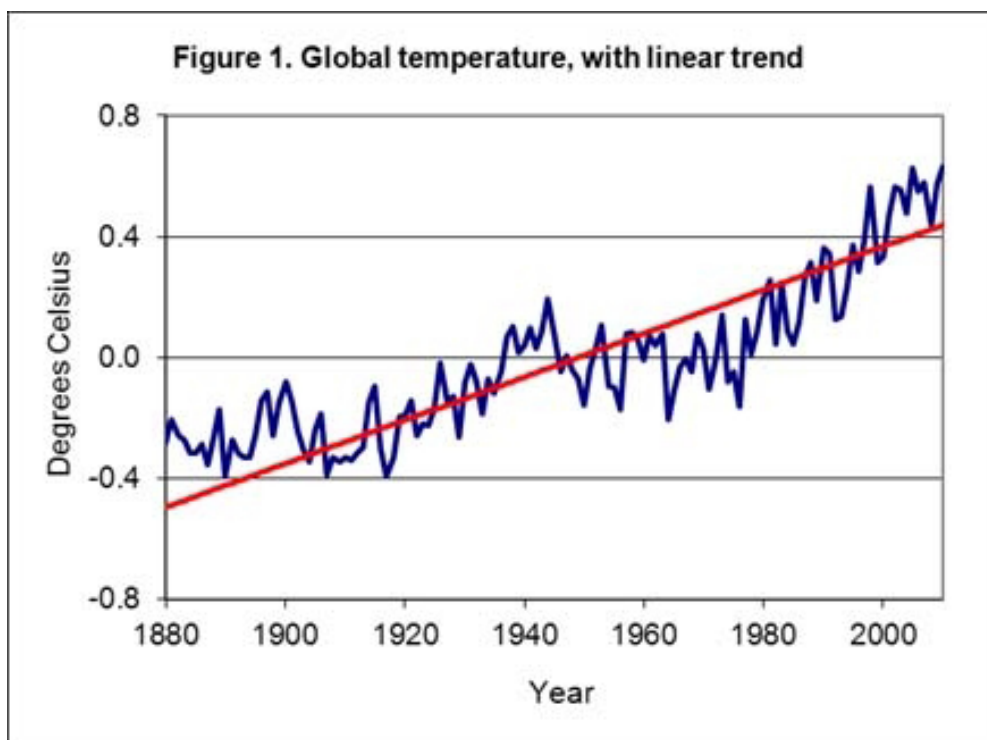
Trevor Breusch

In the introduction to his Climate Change Review 2011, Ross Garnaut explained how he had faced what seemed a particularly Australian tendency for dissenters to deny an upward trend in temperatures, or to claim that any earlier warming trend had gone into reverse in the late 1990s. This note is a non-technical explanation of the work I did with Professor Farshid Vahid (Monash University) to settle the issue (2011).

We took a broadminded view of the data sources and analysed all three of the long time series of global temperature. One such series comes from the Goddard Institute for Space Studies, which is part of NASA in the USA. The global annual temperature taken over both land and ocean, in degrees Celsius and measured as the deviation from a long-term average, is shown in Figure 1 from 1880 to 2010.

The upward trend line shown in Figure 1 could be calculated in any spreadsheet program and suggests warming at an overall rate of approximately 0.6°C per century. If a statistical calculation is made of the chance of observing such a trend from a completely random set of numbers, the answer is essentially zero.

However, no time series is completely random, because there is always a degree of persistence or dependence through time. To a first approximation, any point along the series can be thought of as a fraction of the preceding value plus some variability, which in turn might be completely random or may exhibit further correlation. We allowed the data to determine this pattern by standard time-series methods and estimated the overall trend to be closer to 0.7°C per century, but its statistical significance is reduced – in that case the



Australia's carbon price: good policy or not?

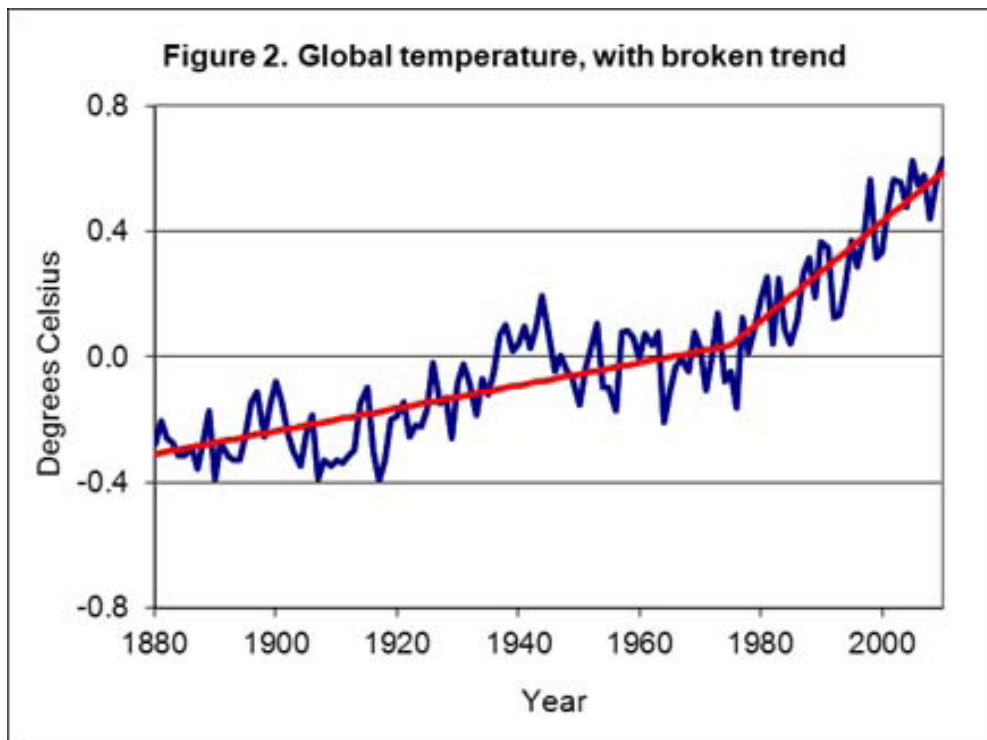
chance of a false positive is about 1 in 10 million.

It is well known to time-series analysts that the standard methods reported in the previous paragraph can falsely indicate a trend when the persistence is unusually large. One way to check this possibility is to assume an extreme degree of persistence as a worst-case scenario and re-estimate the trend. Even under this implausible assumption of persistence we found the trend to be almost as high as before and the probability of falsely inferring a warming trend is around four in one thousand. (The error probability is higher in the other series, but in no case does it exceed the conventional significance level of 5%.) Hence our confident conclusion in support of the warming trend.

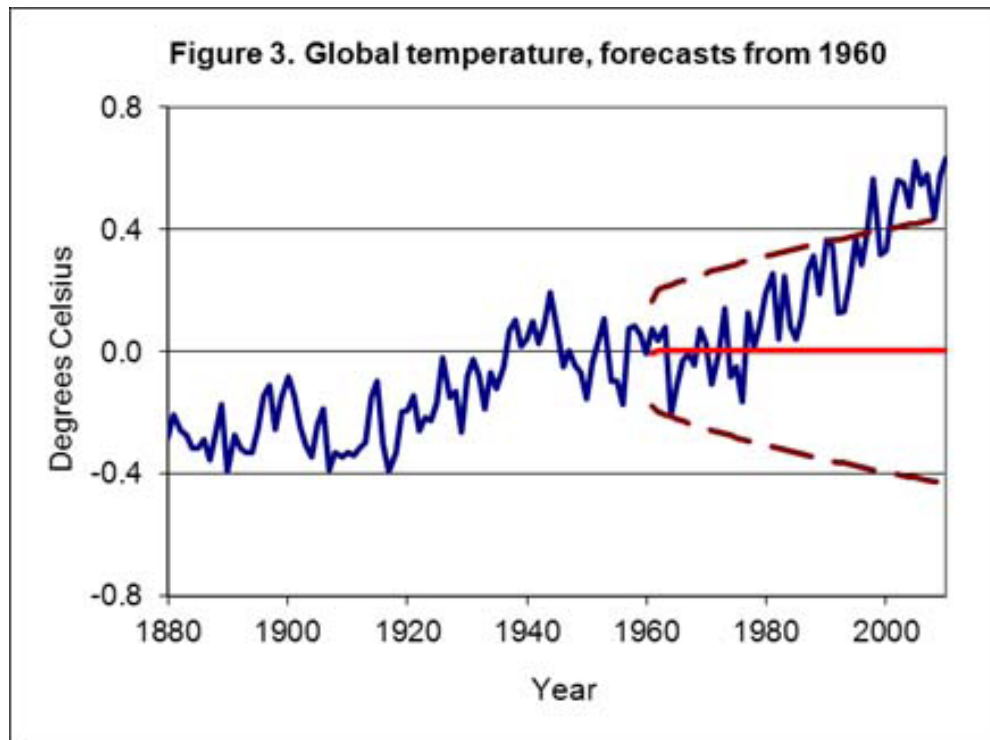
A related question in this debate is: Has the trend changed? Our analysis of this question located an increase in the rate of warming in the middle 1970s, from 0.4°C to 1.2°C per century, as illustrated in Figure 2.

Looking further suggests the next best candidate for a break is another increase in the trend in the years before World War I, although that one is not remotely statistically significant. Of great interest is that we could find no evidence to suggest a reversal of the warming trend in the late 1990s, as some commentators have suggested and as some still assert.

A novel way to assess the warming trend is to imagine an analyst 30, 40 or 50 years ago attempting to forecast today's temperatures without recognizing a warming trend in the data. Even if they assumed extreme persistence, and hence allowed a wide range of likely outcomes, they would be in for a surprise. As shown in Figure 3 for the case of the 1960 analyst, the actual temperatures for most of the last decade have been above the top of the forecast intervals.



Australia's carbon price: good policy or not?



From this analysis it is clear that the planet is warming and this conclusion is beyond reasonable doubt.

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Climate change policy: the jobs issue

Bruce Chapman

It is commonplace in Australian policy debate for groups presumed to be adversely affected by proposed policies to provide estimates of the undesirable consequences of change. A fashionable form relates to predictions of job losses for the group affected, usually accompanied by assertions of additional jobs made by the government of the day or other groups in favour of the policy.

A highly public example of the above is the claim by the Minerals Council of Australia (MCA), based on work done in 2009 by Concept Economics, that the then-planned Emissions Trading Scheme (ETS) would result in 23,510 fewer jobs in Australian mining than would otherwise be the case over the period 2010-2030. At around that time the Climate Change Institute contended that the ETS would add 31,743 additional green jobs over the period 2010 to 2030. Naturally, questions arise from these claims and counter-claims, such as: which group is likely to be correct on the employment effects of the ETS?; and, are these projections of job losses/job gains critical to public assessments of the effects of the carbon price package about to be presented to the Australian Federal Parliament?

A major background issue is that most economists would argue that any changes in the relative price of carbon-producing output must also be associated with offsetting increases in employment as a result of the higher level of activity in, for example, alternative energy production, and this is perhaps the critical point in the debate concerning the consequences of policy reform. While this should be acknowledged as a fact, there remains the interesting empirical question concerning the very large direct 'job loss' and 'job gain' figures in an aggregate sense. For many observers these projections might seem to be extremely large numbers, frightening for some and reassuring for others. Accordingly, it is useful to address the questions: how many jobs are 23,510 and 31,743 really?

The research from Chapman and Lounkaew (2011)

(and recent extensions of their analysis) reports on findings using different data series and methods. The goal is to improve understanding in an aggregate labour market context of the projected mining sector direct 'job losses' on the one hand, and 'green job gains' on the other, as a result of the 2009 planned ETS. While the focus is on the ETS, the illustrations apply in essence to considerations of the likely effects of the 2011 planned carbon price package, and to almost all public and political debate concerning the meaning of job loss or job gain projections from anticipated policy reform. It matters, for example, for the current debate concerning the Murray Darling Basin Plan.

The issues addressed are:

(i) In a static sense (not taking account of time), what would be the effects on the aggregate Australian unemployment rate if either the mining and green direct job losses/gains occurred instantaneously, and without any offsetting employment effects?;

(ii) In a dynamic sense, what would be the increase/decrease in the aggregate Australian unemployment rate by 2020 if the mining/green jobs projections came about, both occurring without any offsetting employment effects?; and

(iii) With respect to job losses concerning mining industry jobs, what might the consequences be in employment status terms for employees leaving mining industry jobs?

We recognise that there are some weaknesses with respect to the data and methods used. Even so, a very clear and consistent message has come through. It is that the projected job losses or gains from the 2009 ETS, particularly when considered over a 10-year time horizon, are in a statistical sense close to invisible with respect to employment and unemployment stocks, and they are both trivial compared with aggregate flows in the Australian labour market. It is apparently also the

Australia's carbon price: good policy or not?

case that with respect to both mining sector and green jobs employment the projected losses or gains are a tiny proportion of overall inflows to, or outflows from, employment. Further, from the use of the Household, Income and Labour Dynamics panel data (HILDA) it seems to be the case that those leaving the mining industry in periods of growth will not be then entering a protracted period, and more likely any period at all, of unemployment.

Our results should not be taken to mean that economic policy reform is costless to all employees (and their communities) who might be affected by sectoral changes in the labour market, and there remain clear roles for government to minimise the personal and social costs for those individuals and areas so disadvantaged. As well, the details of this research cannot be translated into precise estimates of the employment effects of the carbon price policy being developed by the current government. But the essential points concerning the size and meaning of both mining sector and green job employment effects should not be in dispute; the alleged 'jobs losses' and 'job gains' aspects of the climate change policy debate are not in any sense important to the overall policy discourse.

References

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Should we impose a carbon tax?

Henry Ergas

The issue, to my mind, is not whether a carbon tax is a good idea or a bad idea in theory; it is whether it makes sense for Australia to implement such a tax, followed in short order by a move to an Emissions Trading Scheme, at a time of great uncertainty both about the economic outlook and about the extent and nature of the international abatement effort.

These questions are especially acute for Australia because our prosperity is based on a resource endowment that is highly carbon-intensive, both in terms of minerals and in our agricultural sector. Moreover and importantly, much of that carbon-intensity is not amenable to technological quick-fixes – for instance there is little that can be done to reduce fugitive emissions in mining.

It is against that backdrop that we need to assess whether it is desirable for us to impose a carbon tax if many other countries, including the world's largest emitters and our major resource competitors, do not. To my mind it is not, for at least two reasons.

First, global warming is a global problem. Unless major emitting countries engage material abatement efforts, abatement action by Australia is pointless.

Second, as well as being pointless, that action would be highly costly. Economic analysis shows, and long experience confirms, that world minerals supply responds to relative prices, and does so reasonably quickly. If we tax our minerals exports, and competing sources of supply do not, world supply will shift to the untaxed sources, reducing our export volumes compared to the levels they would otherwise have attained. The result will be to reduce Australian real incomes (compared to the 'no tax' world), without yielding any gain in terms of diminishing the risks of climate change.

It is important to also note that this would be an extremely inefficient form of taxation. In effect, fugitive emissions from minerals extraction are essentially a function of output: the more minerals one digs out of the ground, the greater the fugitive emissions. As a result, a carbon tax acts like a supplementary royalty: it is an output-based tax and hence affects marginal sources

of supply. It is difficult to understand how the same government that has consistently criticised royalties as an inefficient form of taxation could overlook that defect in a unilateral carbon tax, all the more so one imposed for no social benefit.

In short, unless there is credible, comprehensive action on a global scale, it is difficult to see why we would impose such a tax.

Let me deal briefly with six criticisms of that conclusion.

The first is that the rest of the world is acting. True, voluntary commitments have been made, but the quantum of those commitments is uncertain, as is whether they will be implemented. For instance, while much has been said about China, there is no doubt that the subsidies China provides to emissions are very much greater than any measures it imposes to reduce emissions. Moreover, it is interesting to note that despite the glowing endorsement of China's efforts in the Garnaut Review, while Treasury's modelling in 2008 assumed (at pages 82 and 86) that China would join a world effort in 2015, its latest modelling assumes (at page 42) that it will only join that effort in 2021. And there is little realistic prospect at this point of significant action by many of our major resource competitors.

As a result, it is prudent to take account of the possibility that comprehensive, global agreement will not be reached, and factor that into the decision. It is strange to see advocates of the precautionary principle acting as risk-lovers when it comes to the carbon tax.

A second criticism is to say that if we act, that will encourage the rest of the world to follow. It may be so, though experience suggests it is doubtful, all the more so as it is contrary to the logic of free-riding, frequently invoked both by the Garnaut Review and by Treasury as underpinning the difficulties of the current international discussions. After all, that logic would suggest that if we impose a unilateral tax on our exports, that only increases the gain to our resource competitors from staying out of any global agreement. But even were it true that our action would positively affect outcomes in the rest of the world, any such effect would be slight at best and could hardly justify the costs and risks unilateral action

Australia's carbon price: good policy or not?

creates.

A third criticism is to say that acting now is less expensive than acting later. However, it would surely be even costlier to take action now only to discover later that it was futile. At that point, high costs would already have been incurred, not least in harming our export industries, and added costs would have to be incurred to dismantle whatever system had been put in place.

Indeed, the extent of those costs was strikingly highlighted by the Member for Isaacs, the Honourable Mark Dreyfus QC, Parliamentary Secretary for Climate Change and Energy Efficiency, when he said that any repeal of emissions permits would require expensive compensation under section 51(xxxi) of the Australian Constitution. In making that point, Mr Dreyfus was merely confirming that implementing this scheme before the global framework is clear imposes very substantial risks on taxpayers.

A fourth criticism is to say that we need such a scheme to reduce the uncertainties facing investors, for instance in electricity generation. I agree they face uncertainties, including those associated with the future international framework for climate change; unfortunately, however, those uncertainties cannot be wished away. Rather, they are a fact of the current global situation. Imposing a scheme such as the one proposed, merely so as to reduce the cost of capital to electricity generators, only shifts the risk on to the community (who may not be the party best placed to bear it) while also being a case of using a sledgehammer to crack a nut.

The fifth criticism is that we are in any event committed to reducing emissions by 5% and this scheme is the least costly way of doing so. As a general matter, it is my view that we should be willing to reconsider the 5% commitment if there is little sign of credible, comprehensive, global agreement. However, even if one takes that 5% commitment as given, it is hardly obvious that imposing such a unilateral tax, while throwing many billions of dollars at a range of rent-seeking projects, is an efficient way of meeting the goal. Rather, before leaping to that conclusion, one would want to see systematic modelling of alternatives.

This brings me to the sixth and last criticism, which is to say that Treasury's modelling shows the costs of such a scheme are low, so we should adopt it as a form of insurance.

However, Treasury's modelling shows no such thing. Rather, what Treasury has modelled is a scenario in which the rest of the world adopts such a scheme and we do too; and it also models the somewhat irrelevant case in which the rest of the world acts and we do not. But it has not modelled, or if it has modelled has

not released, the most relevant scenario, which is the one in which we impose such a scheme and our major competitors do not.

Moreover, Treasury's modelling is based on a range of assumptions that need to be tested – for instance, the assumption that we will be able to borrow permits from the future, and that such borrowing helps the world meet global abatement targets. Even with all those assumptions – and especially the assumption that the industrial countries all abate at a uniform price by 2016 – the costs Treasury estimates are anything but trivial. Rather, discounted at the Garnaut discount rate, they have a present value of \$1 trillion – i.e. about one year of Australia's GDP.

And that, as I noted, relies on numerous assumptions, not least the assumption of global action.

In saying this, let me emphasise that it is absolutely fair for Treasury to have made those and other assumptions – that is in the nature of modelling. But it is also fair for there to be an opportunity to assess the implications of varying those assumptions: indeed, the ability to undertake such sensitivity testing is one of the greatest strengths of economic modelling and is obviously vitally important where decisions of huge significance are at stake. That is why it is critical that researchers and the community generally should have full access to Treasury's model, which after all, has been paid for by taxpayers.

Finally, the notion that such a scheme is a form of insurance makes very little sense. Insurance is an arrangement that ensures some measure of compensation if adverse events occur. In more economic terms, it transfers income from states of the world where its marginal utility is low to states of the world where its marginal utility is high. But in this instance, the relevant adverse event is that attempts at global mitigation fail and we suffer the consequences of global warming. Were that scenario to eventuate, a unilateral carbon tax, far from making us better off when the harm occurs, would only mean we were poorer, and hence even less well-placed to adapt. To that extent, such a scheme comes closer to being anti-insurance: i.e. reducing income (relative to the 'but for' scenario) in states of the world where its marginal utility is high.

Taxation changes and households

John Freebairn

In its July 2011 document 'Securing a Clean Energy Future: The Australian Government's Climate Change Plan', the Australian government proposes to introduce a price on carbon, effectively an increase in indirect tax, and to return about a half of the revenue windfall to lower and middle income households in a combination of increases in social security payments and reductions in income tax. The government claims further that the income tax changes are in the spirit of the Henry Review recommendations to simplify the income tax rate schedule. This briefing evaluates the efficiency, equity and simplicity claims of the indirect tax increase for direct income tax decrease tax mix change package.

A price on carbon associated with either an emissions tax or a emissions trading scheme is designed to internalise the external costs of climate change. It increases the relative prices of pollution intensive products and production processes. At the same time, with no other tax changes, a price on carbon represents an increase in indirect taxation and a revenue windfall for government. While the statutory incidence is on about 500 businesses, most of the indirect tax will be passed forward to consumers as a higher average cost of living, as well as changes in relative prices. For example, the initial \$23/tonne of CO₂-e (albeit on a narrower base than a comprehensive one) is estimated to raise the CPI by about 0.7%. It also is regressive in its incidence.

There are three good reasons to redistribute the government revenue windfall back to households. The first is distributional equity to restore private real spending capacity. The second is to offset the effect of the additional tax compounding distortions of existing taxes on decisions to work, save and invest. Third, compensating households with lower income tax rates in a 2000 type GST reform tax package minimises the probability of households seeking compensating wage and nominal interest rate increases and initiating a wage-price inflation spiral. Each of these three arguments requires returning most of the revenue windfall to households, and not the 50% of the government

proposal. While the return of funds has an income increase effect on expenditure on pollution intensive products, the income effect is relatively small compared with the substitution effect of the changes in relative prices. Also, the three arguments point to reducing the income tax rates for all households, including for all middle and high incomes not compensated in the government proposal.

A part of the government rhetoric in its redesigned lower and more progressive tax rate schedule is that it has followed the Henry Review proposal for a simpler and more transparent tax rate schedule. The current schedule involves the formal rate schedule, a number of tax offsets, including the low income tax offset (LITO), and the Medicare Levy. The Henry Review argued for removal of all the offsets and Medicare levy, plus removal of most tax expenditures giving preferential tax treatment to remuneration taken as fringe benefits, lump sums and superannuation rather than as wages as salaries. The current income tax rate schedule proposal is to reduce but not eliminate LITO. Further, government makes exaggerated claims that the tax free threshold is being trebled from \$6000 to \$18201. In reality, including LITO and changes to it, the effective tax free threshold has been increased from \$16000 to \$20542, with the lower income tax paid to cover the 0.7% increase in the average cost of living. If government is serious about adopting the Henry review and simplifying the tax rate schedule, why not remove all the offsets?

Australia's carbon pricing scheme: prices, targets and trading

Frank Jotzo

Australia is on the verge of legislating for a price on greenhouse gas emissions. What will be the prices, the impact on domestic emissions, and the role of international trading in achieving a national emissions target?

Architecture

Australia's carbon pricing scheme starts out as a quasi-tax in mid-2012, and shifts to emissions trading three years later. This unusual policy architecture was born out of the political need to postpone the decision about the quantitative emissions targets, an issue that the Labor government and the Greens party could not agree on. More fundamentally, it assures that economic impacts on introduction are manageable, while letting future prices – the crucial factor for investment decisions – be determined in markets.¹

Prices

The fixed price starts at \$23 per tonne of carbon dioxide and rises to \$25.40 in 2014-15. This is broadly in line with the average price in the EU ETS over the last few years, but above current EU trading prices (around \$18 in mid-August 2011). Will Australia's carbon price be higher than Europe's? It might for a while – but only if EU prices do not recover from their recent fall that was triggered by fears of renewed financial crisis, and if the Australian dollar exchange rate remains exceptionally high.

Beyond 2015, the policy foresees trading in international markets. Australia's domestic price will be determined in the interplay of Australia's domestic target, and demand and supply from other countries. What the price might be is unknown.

1. See Jotzo, F. (2011), 'Carbon pricing that builds consensus and reduces Australia's emissions: Managing uncertainties using a rising fixed price evolving to emissions trading', CCEP working paper 1104, Centre for Climate Economics and Policy, Crawford School, March.

For a period of at least three years, the market price will be constrained within a corridor. There will be a floor price starting at \$15, as well as a ceiling price that will be set \$20 above the market price on introduction (and which will thus be unlikely to apply). The idea behind the price floor is that reducing downside price risk can encourage cost effective investment in low-emissions assets.² Fragmented markets in international offset credits could result in artificially low prices for some units. Already, credits produced by developing countries under the clean development mechanism are trading at a one third discount to EU permits, and further market segmentation is on the cards.

Targets

Australia's unconditional (and bipartisan) emissions target is a 5 percent reduction at 2020 relative to year 2000 levels. The full target range comprises a 25 percent reduction conditional on a strong global climate agreement, and a reduction up to 15 percent conditional on comparable commitments by developed countries and significant efforts by major developing countries. The goalpost for 2050 is an 80 percent reduction target.

For Australia, any reduction relative to historical emissions levels amounts to a significant abatement task. This is because of an underlying growth trend in emissions, fuelled by expansion of energy intensive industries. However this needs to be seen against the backdrop of Australia being the highest per capita emitter among developed countries, at four times the world average.

The 2020 target is likely to be decided by a future government, probably based on domestic political

2. See Jotzo, F. and Hatfield-Dodds, S. (2011), 'Price floors in emissions trading to reduce policy related investment risks: an Australian view', CCEP working paper 1105, Centre for Climate Economics and Policy, Crawford School, May; and Wood, P.J. and Jotzo, F. (2011), 'Price floors for emissions trading', *Energy Policy* 39(3): 1746-1753.

Australia's carbon price: good policy or not?

and economic considerations as well as international comparisons. The amount of permits issued under the carbon pricing scheme in turn is to be calibrated to the national emissions target, taking into account advice by an independent Climate Change Authority that is to be created. A stronger national target means fewer permits are for sale, and therefore the need to cut emissions or invest in mitigation overseas is greater.

Trading

Australia is likely to be a buyer in international emissions markets, and possibly a larger buyer for a long time. Treasury's modelling shows that under a carbon price, over 60 percent of Australia's abatement task at 2020 being fulfilled through imported reductions, at a cost of 3 billion dollars per year, and domestic emissions remaining near current levels for decades. The true picture may well turn out to be more positive, with a stronger domestic response to the carbon price and other policies, but a significant element of trading is likely.

Thus the scene is set for a major debate about international transfers. The case against 'sending money overseas' will invariably be made. Economic logic meanwhile dictates that we should facilitate emissions cuts wherever they can be had at the lowest cost, and industry will insist to have access to trading opportunities. Australia is a buyer of reductions under just about any plausible scenario of how the global emissions budget is divided up.

However to make large-scale international carbon trading not just economically beneficial but environmentally effective and socially acceptable, better mechanisms will be needed than those devised under the Kyoto Protocol. It will be in Australia's interest to find new ways for financing mitigation action in developing countries.

Carbon pricing: some business perspectives

David Pearce

The idea of a 'business perspective'¹

Even a cursory look at the debate surrounding the 'carbon tax' shows that there is a very wide range of business perspectives on carbon pricing.

Before considering whether there is any common ground to this, it is important to make a few points about the idea of a business perspective in general.

It is a mistake to overuse an artificial category of business interests that are in some way opposed to or sharply diverging with the interests of either government or the general community. While in some discussions there is of course a political distinction, from an economic perspective this distinction can be misleading.

The majority of Australians earn their living through business of some sort (only in Canberra does government employment dominate). Further, the majority of Australians have strong interests in business performance through share ownership: either directly or through the investments of superannuation funds. Third, it is business activity of some sort that provides the goods and services all Australians rely on to meet their various needs and wants.

Finally, and this point is easily missed, if Australia is to move to a low carbon economy then it is business that will actually effect this transition. Carbon pricing policies can be seen as a change in institutional arrangements designed to harness the creativity of businesses in finding new low carbon ways of doing things. Without harnessing this creativity, the task of abatement will, frankly, be impossible. From a business perspective then, the test of the policy framework

1. The views expressed in this briefing are those of the author based on a variety of industry interactions and discussion. They should not be viewed as representing the opinions or policies of any particular industry group. Specific business views can be found in the output of a variety of business peak bodies.

is just how effectively it does harness this creativity.

Economic effects on business

When working through the economic impacts of the proposed carbon price and related policies it is clear that the impacts on current businesses (given currently levels of technology and international competition) are sharply divergent. Some activities are expected to expand, and some are expected to contract (relative to where they would have been in the absence of the carbon policies).

The individual views of businesses will depend very much on where they stand in this regard. Currently energy and emissions intensive and trade exposed activities will suffer the biggest adjustment pressure as a consequence of the carbon price. This includes most of Australia's energy and minerals sector, but also some manufacturing activities (cement, steel, aluminium and so on) along with a range of service activities (construction and trade and transport services, in particular).

In contrast, renewable energy activities, agriculture, forestry and some wood related products are expected to expand (some quite substantially from their business as usual expectations).

Two examples of business concerns about the carbon price

At the broad policy level, it is possible to identify two broad sets of concerns that are common to many business views about the evolving carbon policy, particularly the views of businesses that are likely to face adjustment pressures.

Interaction of multiple policy measures

The first of these relates to the very large proliferation of policy measures in the current policy stance of the Government. The policy package is far more than a price on carbon alone. In addition to the carbon price

Australia's carbon price: good policy or not?

package it consists of a long list of targeted measures and policies including large subsidies to renewable energy, mandatory targets, energy efficiency subsidies and targets and a package of measures aimed at 'carbon farming'.²

One of the most difficult things in interpreting the package is in understanding how, economically, these different measures will interact. Many businesses are subject to more than one of them. In its quantitative analysis at least the government has provided very little guidance on how the measures will effectively interact. The Treasury analysis examines the effect of the carbon price, but does not pull apart the effect of any of the other measures.³ Are they all truly complementary, or are there inevitable conflicts?

International abatement

The second area of common concern is the outcome in the current package of the very high dependence on the purchase of international abatement in order to achieve Australia's targets. According to the Treasury modelling, over 60 per cent (a big majority) of Australia's abatement task will be delivered through the purchase of international units in some way.⁴

In some sense, of course, this reflects an efficient global outcome from Australia's point of view: countries with the lowest cost of abatement do most of the abating, paid for by countries with the highest cost of abatement. In principle this is a welfare enhancing outcome from the perspective of both sides of the transaction.

But the very high reliance on international abatement raises a number of questions from a business perspective. First, there is a great deal of suspicion about the integrity and veracity of some of these international units. There are some well known cases of dubious abatement in the international CDM market which has led some to doubt its future. In the absence of genuine international abatement, the cost to Australia of its targets may be considerably higher.

Second, the high level of international transfers raises a question about the nature of the Australian transition to a low carbon economy. In the mind of some, the large transfer of resources overseas represents funds that could otherwise have been spent on investments and R&D into alternative low emissions ways of doing things in Australia.

2. Details are available at <http://www.cleanenergyfuture.gov.au/> which summarises the broad policy measures.

3. The details of the Commonwealth Treasury's carbon price modelling are available at <http://www.treasury.gov.au/carbonpricemodelling/content/default.asp>.

4. See, for example, chart 5.2 in Strong Growth, Low Pollution available at: <http://www.treasury.gov.au/carbonpricemodelling/content/report.asp>.

The international aspects of abatement also link closely to questions about the competitiveness effects of Australia's carbon price. Here the concern is not with competitiveness in general (after all, the real exchange rate and the real wage rate are two important prices that will adjust downwards with a carbon price in place, mitigating competitiveness effects in general) but with specific commodity or industry competitiveness. Here the concern is that competitors in specific sectors will not necessarily face the same carbon price as will corresponding firms in Australia. Despite the proposed compensation package, it remains very hard to appropriately compensate Australian energy intensive exporters for the marginal cost differences between them and competitors.

Australia can cut more carbon

Anna Skarbek

With all the focus on the carbon tax, it is not surprising that many people are unaware that the government's carbon pricing package did indeed incorporate a suite of other measures to reduce emissions.

ClimateWorks has done a detailed analysis of the impact of all the measures in the government's carbon price package in achieving the abatement potential identified in the Low Carbon Growth Plan for Australia. Our research shows that if implemented successfully, the carbon price package as announced by the government with the default scheme cap of 5 per cent below 2000 levels by 2020 could reduce 124 million tonnes of carbon emission by 2020 within Australia – more than double Treasury's modelling through the carbon price alone.

The complementary measures in the package include the Carbon Farming Initiative where farmers and landholders receive carbon offsets for reforestation, fire management and reductions in emissions from livestock and fertilisers; the Clean Energy Finance Corporation, which will help finance cogeneration and projects developing renewable technologies; and a review of the fuel excise arrangement for all vehicles.

Other key measures include the proposed National Energy Savings Initiative for energy efficiency, a Clean Technology Investment Program and tax breaks for Green Buildings.

Our analysis of the government's package looked at financial and non-financial barriers to reducing carbon emissions in three key areas of energy efficiency, land use (forestry and agriculture) and cleaner power.

We found that the carbon price improves profitability for these actions by making it more cost effective for business to reduce emissions.

However, there are also non-financial barriers to reducing emissions, which include access to capital, information and market structures. These are not addressed by the carbon price but can be removed as a result of complementary measures in the package.

For example, the package provides financial support in the form of grants, loans, equity investments or load guarantees that will overcome some of the shortage of capital facing investors.

Measures that provide access to information and improve awareness and understanding of how to achieve energy savings will also help households and businesses reduce emissions.

A list of major programs in the government's carbon pricing package, and their associated abatement potential are in the table below.

Australia's carbon price: good policy or not?

Key programs (acting with carbon price)	Sector	Associated abatement (MtCO ₂ e)
Carbon Farming initiative (Kyoto compliant)	Agriculture, Forestry, Power	39.1
Clean Energy Finance Corporation (CEFC)	Power	12.1
National Energy Savings Initiative (NESI)	Industry, Buildings	12.0
Payment for closure	Power	11.9
Clean Technology Investment Program	Industry	6.5
Tax breaks for Green Buildings	Buildings	5.9
Other programs		10.4
Total from complementary measures (with carbon price)		98
Emission trading scheme (ETS) at default 5% target	All	Contributes to all above plus 26
Total potential to be achieved by carbon package		124

Treasury modelling indicated that the carbon price alone would produce domestic abatement of 58 million tonnes by 2020. Our research shows that abatement within Australia increases to 124 million tonnes when all measures in the package are considered.

These domestic abatement opportunities take Australia 76 per cent of the way to achieving its 5 per cent emissions reduction target by 2020. This would enable Australia to reverse its growth in domestic emissions to just above 2000 levels.

These opportunities are in addition to internationally sourced abatement. This provides solid evidence for increasing Australia's 2020 pollution cap, to be considered by the independent Climate Change Authority.

The governance measures in the carbon price package allow the ambition of the target to be increased on the basis of independent advice. ClimateWorks Australia's research shows that 25 per cent reductions below 2000 levels is achievable in Australia.

To unlock the remaining opportunities to achieve a 25 per cent reduction (272 MtCO₂e) it will be necessary to build upon the momentum that this carbon price package can create and extend its efforts through measures to deploy more low emissions power, more ambitious mandatory efficiency standards and incentives to make it easier for the remaining profitable activities to be implemented by those not currently reached by the carbon price package.

This is all within our reach.

However, every year we delay action, more opportunities are lost or become harder and more expensive to catch up. ClimateWorks' previous research found that delaying action on climate change to 2015 would increase the cost for business and households by \$5.5 billion to reach Australia's 5 per cent reduction target in 2020.

The good news for now is that the government's carbon pricing package can achieve more than is forecast from just the carbon price alone. Smart program design and delivery will be critical to ensuring the complementary measures in the carbon price package deliver their full potential for emissions reduction.

CRAWFORD SCHOOL OF ECONOMICS AND GOVERNMENT

J. G. Crawford Building 132

Lennox Crossing

The Australian National University

Canberra ACT 0200 Australia

+61 2 6125 4705

www.crawford.anu.edu.au