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Can Emissions Trading Save the Planet?

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Climate scientists distinguish between naturally occurring and anthropocentric (human-induced) climate change, but throughout this chapter the term 'climate change' will be used simply to refer to anthropocentric climate change.

Climate change occurs because of the excessive release of greenhouse gases into the atmosphere. Not only is Australia one of the largest polluters in the world, the growth in its emissions in recent years has been among the fastest in the developed world. Emissions in China and India have been growing rapidly too because their populations are working their way out of poverty. However, their per capita emissions remain a fraction of those of Australia's. Australia's emissions have grown rapidly because we have increased:

- our reliance on the most emissions-intensive form of electricity generation, brown coal
- the amount of energy required to run the average Australian home and Australian car.

Without doubt, the largest component of greenhouse-gas emissions is carbon dioxide (CO_2), which is released from the burning of fossil fuels, particularly coal and petrol.

Why Are We Releasing So Many Greenhouse Gases?

Before explaining what we need to do to reduce Australia's greenhouse- gas emissions, it is first necessary to understand why we are producing so many in the first place. Fortunately, unlike the science of predicting the impact of climate change and the politics of implementing a solution, describing the cause of the problem is simple. Because polluters do not have to pay to use the atmosphere to dispose of their waste gases, they are generating too many of them.

When producers don't have to pay the cost of disposing of their waste, or the cost of the damage that their waste does to others, it is called an 'external cost' or 'externality'. Externalities are a form of 'market failure' and occur because decisions left to the market miscarry. The end result is both inefficient and undesirable.

Imagine, for example, if companies were allowed to leave their garbage accumulating on the streets. There is no doubt that this would make it cheaper for them to manufacture their products, but there is also no doubt that it would make our cities less healthy, less safe and less attractive places to live. We regulate where firms can leave their garbage and require that they pay to have it removed, but at present we allow them to pump as many greenhouse gases into the atmosphere as they want and we don't make them pay a cent to use 'our' atmosphere to dispose of their pollution. Providing something for free is the same as granting a subsidy and has the same consequences as well; producers produce too much and their customers don't pay enough.

Reducing Greenhouse-Gas Emissions

When it comes to tackling climate change, the policy objective is to reduce the amount of pollution. This can be done in several ways:

- by regulation
- by introducing a carbon tax
- with an Emissions Trading Scheme (ETS).

The Rudd Government has decided to focus on the third option and proposes to introduce a partial emissions trading scheme in 2010. As the following sections will show, however, there are significant differences between the form of ETS described in most economics textbooks and the partial ETS, known as the Carbon Pollution Reduction Scheme (CPRS), proposed by the Rudd Government. It is also impor-

tant to note that, despite claims that the Rudd Government relies on 'evidence-based policy', the decision to develop the CPRS rather than pursue a carbon tax or the regulation of big polluters was made without any formal evaluation of the costs and benefits of each option.

The 'market-based nature' of an ETS has led to repeated claims that it will ensure a reduction in Australia's emissions at the lowest possible cost (often termed 'least cost abatement') and that it will provide greater 'incentive' for firms and individuals to invest in innovation. These claims are critically assessed in detail below.

A Textbook ETS and the CPRS: A Comparison

As the Rudd Government has relied on theoretical arguments about the benefits of an ETS, it is important to asses the degree of similarity between the textbook version and the proposed CPRS. For if the CPRS does not closely resemble the textbook ETS, in fact there is no evidence on which to base the argument that it is the best policy choice. This section compares the steps in a textbook ETS with the design features of the proposed CPRS.

Step 1: Selecting the Target

The Textbook ETS

The first step is to decide how much pollution is acceptable and to set a commensurate emissions-reduction target. An 'evidence-based' approach would rely heavily on scientists to determine the level of pollution required to prevent climate change; however, in Australia the Government will be relying on a combination of politicians and economists to ensure that it gets the right 'balance' of environmental conservation and economic growth.

Given the long-lived nature of greenhouse-gas emissions and the need for large-scale investment in new technologies to reduce them, greenhouse-gas emissions targets are usually expressed as 'trajectories' over long time periods. It is important to understand that although the debate is principally about what Australia's emissions should be in 2020 and 2050. Such 'point estimates' are attached to implied trajectories of emissions reductions for the intervening years. That is, calls for a 30% reduction in Australia's emissions by 2020 implies a gradual reduction of emissions between now and 2020, rather than continued inaction until 2019 followed by a very large reduction in 2020.

The CPRS

Despite overwhelming scientific consensus that Australia needs to reduce its emissions by between 25% and 40% by 2020, the Rudd Government has proposed a mere 5% reduction, rising to 15% if other countries are deemed to have 'done their bit'.

It is interesting to consider the role of evidence in the selection of such a modest target. The single reason to tackle climate change is because climate scientists have persuaded policy-makers that action is essential. It seems illogical, therefore, to ignore those same scientists when selecting an emissions-reduction target. It is often suggested that business groups want 'certainty' when it comes to climate change, so it is interesting that the Rudd Government has received no criticism from the large polluters for not providing certainty in relation to the actual annual emissions targets for each year between 2010 and 2020.

This failure to provide precise annual emissions targets exposes both the annual targets and the ultimate 2020 target to the lobbying of the large polluters. It seems that big polluters are comfortable with uncertainty about the level of targets as long as those targets are not too ambitious.

The Government has relied heavily on the argument that Australia's emissions reductions will be more ambitious on a per capita basis, but such an argument contains a number of flaws.

1. From the point of view of the atmosphere, it is the absolute level of emissions that is important, not the per capita level.
2. The Australian Government has more control over population growth than most due to the country's growing reliance on the importation of skilled labour. It is hard to see how the Government can argue that population growth is somehow beyond its control.
3. Australia's per capita emissions are among the highest in the world.
4. If China had not previously undertaken substantial population control, their emissions would be substantially larger than they are at present.

While the Australian Government urges special treatment due to Australia's strong population growth, it has not suggested that China should be awarded special treatment for the population-reduction efforts the Chinese have already made.

Step 2: Converting the Target Into Permits

The Textbook ETS

Step 2 is to convert the acceptable level of pollution into a fixed number of permits. For example, if the Government wanted to restrict Australia's emissions to one million tonnes per year, it would print one million permits, each of which would allow its owner to emit one tonne of pollution over that year.

The main advantage of emissions trading is that the creation of tradeable permits to pollute will provide firms with a financial incentive to reduce their pollution. If they can find a way to emit one tonne less pollution, they can either sell one of their permits or buy one fewer. Either way, they can save money on permits if they can think up ways to reduce pollution. Thus, an ETS can deliver 'least cost abatement' if it is operating correctly.

The CPRS

The argument that an ETS delivers 'least cost abatement' is based, in part, on the mechanism that allows polluters to purchase permits from each other. However, in the Australian CPRS, some sectors of the economy will be 'covered' while others, including agriculture, will remain 'uncovered'. This will require the subset of 'covered' Australian producers to meet the Government's 5% emissions-reduction target.

Agricultural producers will not be obliged to reduce emissions. They will not have to measure their emissions, purchase or remit permits, or pay any penalties if their emissions increase. There are a number of good reasons to exclude agriculture from the CPRS, most significantly the impossibility of measuring the emissions from 130,000 small farms. But the consequences of leaving agriculture out of the CPRS cannot be overstated and denies the claim that the scheme will deliver 'least cost abatement'. Consider the following example.

In a textbook ETS, a firm faced with a permit price of $25 per tonne of emissions would be willing to spend up to $24.99 per tonne either investing in emissions-reduction technology or paying some other organisation to reduce its emissions. So a big polluter, required to pay $25 per tonne to emit, would be willing to pay a beef farmer, say, who realises only $5 of profit on every tonne of greenhouse gas generated on the farm, $24.99 to grow less beef, freeing up capacity

for the big polluter to pollute more and yielding more profit for the farmer. However, under the Australian CPRS such a trade cannot occur because there is no nexus between 'covered' and 'uncovered' sectors of the economy. The existence of 'uncovered' sectors means that the CPRS cannot deliver 'least cost abatement'.

Furthermore, as discussed below, the decision to oblige only the 1000 largest polluters to purchase permits significantly reduces the capacity to achieve 'gains from trade' between large polluters, the household sector and the commercial property sector.

Step 3: Deciding Who Will Be Responsible for Remitting the Permits

The Textbook ETS

Step 3 is to decide who will be held responsible for the pollution. This might seem simple, but consider the following examples.

- A power station burns 1000 tonnes of coal to generate electricity, which is on-sold to an electricity retailer who then sells it to householders. In this scenario, which entity should become responsible for buying the pollution permits?
- A mining company drills for oil and sells the oil to a petrol refinery, the refined petrol is then sold to a petrol station and, finally, motorists buy the petrol for their cars. Which entity in this scenario should have the responsibility for buying the permits?

The CPRS

In the economics textbook, the 'final consumer' is expected to buy the permits, but the Australian CPRS requires only the big 'upstream' polluters to do so. This does make the system administratively simpler, but it does not reduce the costs faced by households because the big polluters simply add the price of the permits on to the price of their electricity and petrol. Furthermore, requiring the big polluters, rather than households, to buy permits results in some unintended consequences, including the fact that efforts by individual households to reduce their carbon footprint will have absolutely no impact on the magnitude of Australia's emissions. Households using less electricity, and therefore needing to buy less electricity, will simply mean that their power station will be left with 'spare' permits to sell to other large polluters. This 'unintended consequence' will be discussed in detail below.

Under the CPRS, only polluters emitting more than 25,000 tonnes of carbon dioxide per year (or an equivalent amount of other greenhouse gases) will be required to purchase and remit permits. Thus, the Government will monitor the production of oil refineries and will require them to buy and remit permits instead of individual petrol stations or individual drivers.

It is estimated that there will be around 1000 polluters emitting more than the threshold 25,000 tonnes of greenhouse gas per year and only those polluters will be required to monitor their emissions, purchase permits and remit them to the government each year. Millions of small and medium-sized businesses and 10 million households will not have any direct involvement in emissions trading, although they will experience the indirect effects of the scheme as the 1000 big polluters increase the prices they charge for their products.

There is no doubt that requiring the big oil companies and the big coal-fired power stations to buy and remit permits will involve a lot less paperwork but this 'administrative simplicity' imposes an enormous cost, both to the economy and to the environment.

The Environmental Cost of Limiting Pollution Obligations to the Big 1000 Polluters

The decision to limit the purchasing and remitting of permits to the 1000 largest polluters makes it impossible for concerned individuals, through their own actions, to have an impact on Australia's emissions. When the CPRS begins operation in 2010,[1] households will not reduce Australia's emissions by a single kilogram when they install solar panels, take shorter showers or drive their cars less frequently. Unfortunately, the only consequence of their reduced energy use will be to 'free up' pollution permits that will allow the big polluters to increase their own emissions.

Consider the following example. A household reduces its electricity use through investment in new technologies and behavioural change. As a result, the coal-fired power station that supplies its power will burn a bit less coal and thus produce fewer emissions. Now that the power station has lowered its emissions, it needs fewer permits. However, as the number of permits issued by the Government remains unchanged, the reduced demand for permits by the power station simply means that now there will be additional permits available for the aluminium industry, or any other large polluter, to increase pollution.

The fundamental design flaw in the proposed CPRS is that the 1000 big polluters will continue to 'own' any spare permits that result from emissions reductions — even if those reductions are the result of efficiency gains made by individuals. Community groups, local councils and even state governments willing to reduce Australia's emissions by their personal efforts will actually be prevented from making any difference whatsoever.

This situation is bad enough, but it gets worse. The harder individuals work to reduce their energy use the lower the demand for, and therefore the price of, the pollution permits purchased by the big polluters will be. And, to rub salt into the wound, the power stations will be able to profit from selling the 'spare' permits that were created by the efforts of well-meaning households and communities.

The system need not be so absurd. It is possible to amend the CPRS so that those who invest in energy efficiency receive credit for the 'spare' permits they have created. If these permits were then retired rather than sold to the big polluters, the result would be a genuine reduction in Australia's emissions. It's not surprising that the big polluters think this problem is not worth solving, but it is surprising that so soon after ratifying the Kyoto Protocol the Prime Minister is not only happy to introduce unambitious targets, but also to ensure that anyone who wants to contribute further efforts will make no difference at all.

To restate this problem in its boldest terms, the CPRS, as it is currently proposed, not only sets a cap above which emissions cannot rise, it also creates a floor below which they cannot fall. Individual action, community action, and even the action of councils and state governments, can have absolutely no impact on the level of Australia's emissions. In the words of the NSW Government's electricity regulator, the Independent Pricing and Regulatory Tribunal of NSW (IPART):

> Under an emissions trading scheme, the quantum of allowable emissions will be fixed. The limit on emissions will apply to all emissions sources covered by the scheme. Additional measures to reduce emissions in sectors covered by the scheme would not result in an increase in emissions abatement — under the global cap, the emissions avoided through undertaking an additional measure would result in an equivalent increase in emissions elsewhere. How and/or where emissions are reduced changes, not the amount.[2]

There has been much talk of cooperative federalism since the election of the Rudd Government, but absolutely no discussion about the desirability of the Commonwealth creating an emissions trading process that literally prevents Australia from achieving a reduction in greenhouse-gas emissions over and above the mooted 5% limit. The grassroots communities in Australia have begun to be concerned with climate change and to take some action to address it, but unless the CPRS is modified in the Senate, its advent will make the continuation of such efforts entirely futile.

The Economic Cost of Limiting Pollution Obligations to the Big 1000 Polluters

The decision to require only the 1000 largest polluters to buy and remit permits will, as mentioned above, save a lot of paperwork, but in doing so it will also significantly reduce the economic benefits afforded by an ETS. In the language of economists, the CPRS trades off lower administrative costs for a substantial reduction in 'allocative efficiency'.

Allocative efficiency refers to the capacity of a market to allocate resources efficiently. It is the main reason that economists generally prefer emissions trading to a carbon tax because, under a textbook emissions trading system, individual polluters can trade with each other to ensure that those who are able to reduce their emissions at lowest cost are the ones that do so.

For example, consider a mining company that owns a generator at a mine and rents serviced accommodation to 2000 workers in a 'town' it owns. Provided the capital costs of the investment are less than the cost of permits, the company, under a textbook ETS, would be happy to invest in energy-efficiency measures at the hotel to achieve internal abatement. However, under the CPRS, the mining company would not be able to capture directly the 'spare' permits resulting from the hotel's reduced energy use. The result of any increase in energy efficiency achieved by entities other than the 1000 large polluters will result in an increase in permits available for ALL large polluters. The mining company, which invested in increased energy efficiency at the 2000-room hotel, would secure only a very small percentage of the benefits of its investment.

The CPRS completely prevents the 1000 big polluters from achieving these 'gains from trade'; they cannot trade with the millions of households, small and medium-sized businesses or state and local

governments because these entities do not have any permits to sell. The major advantage of an ETS is that it ensures that organisations able to achieve emissions reductions at least cost are the ones that do so, but the design flaws in the CPRS actively prevent a big polluter from investing in energy efficiency in an externally owned facility.

Step 4: Allocating the Permits

The Textbook ETS

Step 4 allocates the permits. In the textbook version of an ETS, permits are auctioned to the highest bidder. In fact, this is one of the main advantages of an ETS. It ensures that producers who value pollution very highly (for example, the airline industry, which cannot significantly reduce pollution without reducing the number of flights) will always be able to purchase a large number of permits. On the other hand, polluters who can avoid polluting at low cost (for example, by investing in new technology) will choose to buy new machinery rather than additional permits.

The CPRS

A textbook ETS relies on the auctioning of pollution permits to ensure that the 'polluter pays' principle is observed, but the CPRS gives away the majority of permits, with the biggest polluters receiving 90% of their permits for free and smaller polluters receiving 60% of their permits for free.

In one of the more unusual elements of the CPRS, the faster a big polluter's emissions grow, the more free permits it will be entitled to in future years. Indeed, the emissions of large polluters are forecast in the Government's White Paper to grow so rapidly that by 2020 around 45% of all permits will be given away.

Step 5: Trading the Permits

The Textbook ETS

Step 5 is where the trading comes in. If polluters find they have 'spare' permits, they are free to sell those permits to other polluters who would like to increase their levels of pollution. The buying and selling of permits will determine their price in the same way that the buying and selling of stamps or shares or houses determines the price of stamps, shares and houses.

In the textbook version of emissions trading, the supply of permits is determined solely by the desire to achieve a given reduction in pollution. The demand for permits is determined by the willingness of firms to either pay for permits, thereby increasing demand, or invest in 'abatement' technologies, thereby freeing up permits and causing, perhaps, a glut in the market. These forces of supply and demand are responsible for setting the permit price.

It is important to point out that, in the textbook at least, it is the target that largely determines the permit price, not the permit price that determines the target. Given that the whole point of an ETS is to achieve a safe reduction in the level of emissions, it would be self-defeating to change the target in response to concerns about the price.

The CPRS

Under a textbook ETS, the forces of supply and demand set the price of the permits. Under the CPRS, however, the price of permits will be capped at $40 per tonne, so if the demand for permits is sufficiently strong, the Commonwealth Government will intervene in the market to ensure that the price does not rise above $40.

This decision, while providing businesses with the 'certainty' they suggest they need, means that rather than having a 'market-based' ETS, in which market forces set the price, Australia will have a government-managed CPRS, in which polluters will benefit if the market price is low, but taxpayers, not polluters, will bear the risk if the market price is high.

The benefits of providing business with 'certainty' about the maximum price of permits is acknowledged, but it is important to emphasise that those same businesses operate in an environment in which they have very little idea what the exchange rate, interest rate, inflation rate or unemployment rate will be in five years' time. Nor do they have much certainty about the cost of coal, oil or wages in five years' time. It is absurd to suggest that big businesses cannot invest unless they have 'certainty' about emissions permit prices.

Step 6: Remitting the Permits

The Textbook ETS

Step 6 involves polluters 'remitting' their permits to the Government. If a polluting organisation is responsible for producing 1000 tonnes of

emissions in a given year, it must hand over 1000 pollution permits at the end of that year. The Government will need to construct an entire regulatory system to ensure that emissions from all polluters are measured accurately, that firms are remitting the correct level of permits and that any firms found guilty of either concealing emissions or failing to remit their permits are prosecuted. For an ETS to work effectively, it is essential that the cost of noncompliance is significantly higher than the cost of purchasing permits; otherwise, some firms will decide that the 'rational' strategy is to ignore the requirements of the ETS and simply pay any fines if they are caught.

The CPRS

The process of measuring and reconciling individual emissions with the number of permits remitted by the big polluters will, by necessity, be a complex and expensive task. While the exact details of this process are yet to be finalised, it is already apparent that the administrative cost of operating the CPRS is probably not justified by the very small benefit associated with a 5% emissions-reduction target.

Although a textbook ETS has some theoretical advantages over policy tools such as a carbon tax, it is also much more complex and expensive to administer. It could be argued that if Australia were to pursue an ambitious emissions-reduction target of more than 20% by 2020, the administrative cost of an ETS-type scheme might be justified. But the large administrative cost of the CPRS, combined with the small 5% emissions target, suggests that the Government is using a bureaucratic sledgehammer to crack a tiny emissions reduction peanut.

Conclusion

At every step in its design, the CPRS diverges significantly from the textbook model of an ETS. In particular:

1. The targets are not based on science.
2. The coverage of the scheme is incomplete.
3. The structure of the scheme will destroy incentives for voluntary action and ensure that least cost abatement is not achieved.
4. Free permits will be given to the largest polluters, negating the polluter pays principle.

5. The permit price will be capped at $40, preventing the market from setting the price.
6. The administrative costs of the scheme will be disproportionate to the small benefits associated with a 5% emissions-reduction target.

The Government has relied on theoretical evidence about the relative benefits of an ETS compared to options such as a carbon tax. Nevertheless, given the degree of disparity between a textbook ETS and the Rudd Government's CPRS, it appears that there is, in fact, no substantial piece of evidence to support the assertion that the CPRS is the best mechanism for Australia to rely on in its efforts to reduce greenhouse-gas emissions. A well-designed ETS could help to save the planet, but the CPRS is not a well-designed ETS.

Endnotes

1 At the time of writing, the Rudd Government was giving no indication of its willingness to address this problem. It is possible, however, for the CPRS to be amended in such a way that the problem could be rectified.

2 IPART New South Wales, 2008. Review of NSW climate change mitigation measures, Other Industries — Issues Paper, December, p. 20.

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