

Chapter 11

Alternative approaches to reducing emissions

The CPRS: a cap-and-trade approach

11.1 The Government's CPRS is a production-based cap and trade model. The production-based cap and trade model is often cited as the most common approach to emissions trading.

11.2 Under a cap and trade scheme, tradable permits are issued by the government which entitle the permit holder to emit a specified volume of greenhouse gases to the atmosphere (during a specified period). Some systems also allow 'banking' of permits for use in future compliance periods.

11.3 The specified volumes are a series of short- to medium-term targets reaching out to a longer term target, referred to as an 'emissions trajectory'. The duration of a cap or baseline is an important consideration. Too short a period may not provide adequate investor/market certainty; such certainty is desirable as it allows markets to develop a forward carbon price to guide investment decisions and encourage uptake in technology and its development over the long term. On the other hand, too long a period may provide certainty but reduce government's ability to make adjustments in response to, say, changes in climate change science or technology. Emissions reductions schemes may attempt to address this problem in various ways, such as by setting firm caps in early years of a scheme but a range for caps in later years.

11.4 Clearly, to achieve a reduction in greenhouse gas emissions, the total cap placed on emissions must be less than the emissions that would have been generated under a business as usual scenario. The market price for emissions permits must be high enough to provide an incentive to participants to reduce their emissions relative to business as usual projections. For example, too high a cap can result in over-supply and a low market price for emissions permits.

Alternative approaches

11.5 There are a number of alternative models to CPRS-like cap-and-trade emissions trading schemes that could potentially be used to restrain the emission of greenhouse gases. Among those presented to the Committee were;

- a) Carbon tax;
- b) McKibbin hybrid model;
- c) Baseline and credit (also known as the "intensity approach" and the "Canadian approach"); and

- d) Cap and trade based on consumption; and
- e) Regulatory approach.

11.6 Some of the factors relevant to assessing the worth or success of any proposed or operating emissions reduction scheme are:

- ability to deliver actual reductions in emissions;
- cost effectiveness;
- extent to which a scheme provides incentives for investment and performance improvement;
- flexibility to continually adapt to changes in climate change science/policy/technology;
- robustness of monitoring and verification systems for emissions;
- transparency; and
- fairness and equity.¹

(a) Carbon tax

11.7 A carbon tax is a tax levied on greenhouse gas emissions. The differences between a carbon tax and an ETS are often overstated. An ETS that gives rise to a carbon price of \$25 a tonne has essentially the same impact on emissions and on the economy as a carbon tax of \$25 a tonne if the coverage of the two schemes is the same.

Price certainty versus emissions certainty

11.8 The main advantage of a carbon tax is that it gives (at least in the short term) more certainty about the price impact. But it does this at the cost of less certainty about the volume of emissions. Hitting a medium-term target for emissions is likely to require adjustments to the carbon tax rate from time to time. This reduces the price certainty provided in the medium term. Views differ about the extent to which it would also be politically difficult to raise the carbon tax rate.

...an emissions trading scheme gives you certainty about how many emissions enter the atmosphere, whereas the carbon tax gives you certainty about price but does not give you certainty about the amount of emissions that enter the atmosphere, because that depends on the relationship between the carbon price and the responsiveness of the economy. That is really the

1 David Hodgkinson and Renee Garner, *Global climate change: Australian law and policy*, 2008, p 242.

fundamental difference between the carbon tax and the emissions trading scheme.²

11.9 There is a theoretical literature about whether certainty about prices or emissions volumes is more desirable:

The theory of prices versus quantities for pollution control (Weitzman 1974) shows that such uncertainty [about abatement costs] will invariably lead the policy to under- or overshoot the optimum. Imposing a quantitative target will lead to higher or lower marginal abatement costs than expected, while a given tax rate will lead to a greater or lesser abatement effort than expected. The resulting efficiency costs are thought to be lower under a price-based instrument for stock pollutants such as greenhouse gases, so getting the price wrong under a tax imposes smaller welfare losses than getting the quantity wrong under a quantity target.³

11.10 The Government's reasoning for preferring an emissions trading scheme over a carbon tax is that:

If the Government had full information about the relationship between carbon prices and the quantity of emissions reductions that such prices would induce, a carbon tax and an emissions trading scheme could deliver similar economic and environmental outcomes...The key benefit of an emissions trading scheme over a tax is that it secures the environmental objective by controlling the quantity of emissions directly. It is possible that emissions trading may provide greater long-term policy credibility, as the community can see the direct link between the policy instrument and the environmental objective. Australia's international commitments are likely to continue to be defined as quantitative targets, so this approach allows international obligations to be managed more effectively.⁴

11.11 As the Government put it:

Both a carbon tax and an emissions trading scheme would need to be adjusted over time to reflect new emissions targets as the international architecture matures and scientific understanding of the global mitigation effort improves.⁵

11.12 There may be desirable stabilising effects from the systems that involve more certainty about volumes:

...within a cap and trade system, demand for and price of permits can be expected to fall in response to any large increase in the price of fossil fuels.

2 Mr Blair Comley, Deputy Secretary, Department of Climate Change, *Proof Committee Hansard*, 18 March 2009, p 12.

3 *Garnaut Review*, p 196.

4 *White Paper*, pp 5-11, 5-12.

5 *White Paper*, p 5-12.

This would be to some extent stabilising, unlike the rigid application of a fixed carbon tax.⁶

Simplicity

11.13 Aside from short-term price certainty, a common argument for a carbon tax is that it is simpler and could therefore be implemented more quickly:

The simpler carbon tax would have lower transaction costs.⁷

A carbon tax is preferable to a carbon trading system because it is more efficient, effective, simple, flexible, and transparent.⁸

...it might be argued that a carbon tax has an air of justice or fairness — taxing those responsible for creating the harm. Emissions trading could mimic this effect but would do so in a less transparent manner.⁹

11.14 The Government rejects this argument, claiming that 'most of the implementation and administrative requirements apply equally to an emissions trading scheme and a carbon tax'.¹⁰

Revenue

11.15 It is also sometimes claimed that a carbon tax would raise more revenue and be less distorting:

A carbon tax is preferable to a carbon trading system ... a carbon tax has the added benefit of providing revenue which can be used to cut other taxes.¹¹

11.16 This argument is flawed as the revenue raised and the extent of distortions is a function of the coverage and exemptions in schemes, not the choice between an ETS and a carbon tax.¹²

International aspects

11.17 Some also see a common carbon tax as a better global aspiration than an international emissions trading scheme:

6 *Garnaut Review*, p 196.

7 *Garnaut Review*, p 196.

8 Mr John Humpheys, 'Exploring a carbon tax for Australia', *Centre for Independent Studies Policy monographs*, no 80, 2007, p ix.

9 Joshua Gans and John Quiggan, 'The practicalities of emissions trading', *Melbourne Review*, vol 3, no 2, November 2007, p 63.

10 *White Paper*, p 5-13.

11 Mr John Humpheys, 'Exploring a carbon tax for Australia', *Centre for Independent Studies Policy monographs*, no 80, 2007, p ix.

12 See, for example, Professor Ross Garnaut, *Proof Committee Hansard*, 23 March 2009, p 55.

Proponents of price-based emissions control have pointed out that a common global carbon tax or an agreement on an internationally harmonised price to apply in domestic permit trading schemes would avoid both questions of distribution between countries inherent in a cap and trade system, and the potentially destabilising effects of large-scale international financial flows.¹³

11.18 Probably the more common view is that a carbon tax is inferior to a cap-and-trade scheme because it does not offer scope for international trade in permits to allow abatement to occur where it is least costly.

Exemptions

11.19 A carbon tax is attracting support from some who see the CPRS as an excessively compromised form of emissions trading, with many industries being given free permits under complex rules. For example, exports could be exempted from a carbon tax, as they are from the GST, which may be simpler than the arrangements for shielding trade-exposed industries in the CPRS.

11.20 However, it is almost certain the same lobbyists who push for free permits for certain industries would be lobbying as hard for exemptions from a carbon tax for these industries. It may be that there is some political reason why it is easier to resist pressure for tax exemptions than for free permits, but the Committee has not heard it.

Committee comment

11.21 The Committee regards a carbon tax as sharing many of the features of an emissions trading scheme in reducing emissions by putting a price on carbon and raising revenue. However, the committee prefers an emissions trading scheme model, such as the CPRS, as it gives certainty about the maximum volume of emissions.

(b) McKibbin hybrid model

11.22 The McKibbin hybrid model involves a mix of long-term and annual permits. Governments would issue industry with 'books' of annual permits lasting for fifty to a hundred years. The total number of these long-term permits would be based on the long term emissions reduction target, for example an amount equivalent to 60 percent of Australia's 2000 emissions. These 'books' of annual permits would be traded in the market, providing a long term carbon price signal.

11.23 In addition, governments would sell to industry an unlimited number of annual permits at a fixed price. This aspect of the scheme is equivalent to a carbon tax.

11.24 The price of annual permits would be adjusted periodically, for example every five years. Eventually, the annual permit price and the price of long term permits will eventually converge.

11.25 Professor McKibbin argues that his design would achieve short term carbon price certainty as well as long term certainty as to the quantity of allowable emissions.

11.26 He draws an analogy with the way the Reserve Bank uses monetary policy tools to control the short-term interest rate and achieve an inflation target while the market sets long-term bond yields:

...this system should be run by an independent central bank of carbon not by a climate change department or by an Australian Treasury. An independent central bank of carbon should run a policy in a very similar way to the way the Reserve Bank runs monetary policy, where government sets the long-term goals and independent experts implement the policy. ... the short-term carbon price should be unambiguously fixed for five years at a time by something like a central bank of carbon.¹⁴

11.27 The most common criticism of the McKibbin hybrid model is its complexity:

It is a slightly complex model. I have heard Warwick speak to that model a couple of times now and I must admit I have not fully grabbed it.¹⁵

One of the recognised hallmarks of good policy is simplicity. The hybrid system is complex and many audiences have been left confused after being presented with the system.¹⁶

11.28 Professor Garnaut regards the basic feature of the McKibbin model as being the imposition of an upper limit on the price of permits in a cap and trade emissions trading scheme. He regards it as 'combining the disadvantages of both' emissions trading and a carbon tax, requiring the institutional and administrative apparatus of an emissions trading scheme but without giving certainty about emissions reductions.¹⁷

11.29 As with a carbon tax, emissions would be uncapped in the near term, making it difficult to achieve short to medium term emissions targets. The McKibbin hybrid scheme would also require governments to 'lock in' very long term targets. If the government subsequently wanted to reduce the number of long term permits (for example in response to new scientific evidence), it would need to buy these back from industry.

14 Professor Warwick McKibbin, *Proof Committee Hansard*, 25 March 2009, p 97.

15 Mr Rynne, *Select Committee on Fuel and Energy, Committee Hansard*, 20 February 2009 p 30.

16 Clive Hamilton and Frank Muller, 'Critique of the McKibbin-Wilcoxon hybrid emissions trading scheme', *Australia Institute Research Paper*, no 42, March 2007, p 7.

17 *Garnaut Review*, p 310.

11.30 It would be difficult for the market to price long term permits. The market would need to make predictions about the rate at which the government is likely to increase the price of annual permits, as well as the other market factors likely to impact on the supply and demand for carbon a long time into the future. This could result in volatile prices.

Committee comment

11.31 The committee views the McKibbin model as an interesting approach. However, it prefers to start with a more orthodox approach that can draw on experiences with similar schemes and be more readily linked with proposed schemes elsewhere. As noted when commenting on the carbon tax, the committee prefers a system which gives certainty about the maximum volume of emissions.

(c) Baseline and credit

11.32 Baseline and credit emissions trading systems are production based systems of emissions trading in which there is no explicit cap on emissions. Instead, participants are allowed to emit CO₂ according to a (usually historical and industry-specific) baseline level of emissions.

11.33 Where a participant in a baseline and credit scheme emits less than their baseline level (or allowance) of emissions, the unused part of the allowance forms an emissions reduction credit which is able to be banked for future compliance needs or else traded in the emissions market. This is what leads Garnaut to say such schemes 'effectively place the creation of permits in the hands of private parties (existing emitters) rather than the government'.¹⁸

11.34 A possible benefit of a baseline-and-credit scheme is that it involves less churning of funds than a cap-and-trade system.

11.35 A participant that exceeds their baseline level can purchase emissions reduction credits in the market to meet the shortfall in their allocated credits. Unlike cap-and-trade systems, in baseline and credit schemes credits are only issued where an emissions saving has been achieved; such credits are usually earned on a project-by-project basis. (A cap-and-trade model can be regarded as a baseline-and-credit system with a baseline of zero. Alternatively, a baseline-and-credit model can be thought of as like a cap-and-trade model with 100 per cent free permits to all existing polluters.¹⁹)

11.36 The baseline is usually expressed in terms of 'emissions intensity', which is a measure of carbon emitted for a given amount of production or revenue. The sum of

18 *Garnaut Review*, p 309.

19 Professor Ross Garnaut, *Proof Committee Hansard*, 23 March 2009, p 64.

all baselines for participants in the scheme amounts to a sort of implicit cap on emissions; although if total output is higher than expected, then so will be emissions.

The Canadian scheme is an emission intensity target, so you can never be sure—even though firms might be improving their emissions intensity—what quantity adjustment is going to occur in your economy.²⁰

11.37 Baseline and credit systems, by allowing credits to be generated from abatement activities, should create economic incentives for participants to invest in lower emissions technology or abatement activities to reduce their actual emissions.

11.38 Environmental outcomes become uncertain due to the difficulties of verifying and certifying emissions reductions, such as differences in or changes to the methodology used to set baselines, or double-counting problems associated with attributing credits to more than one emitter for a particular emissions reduction action. Such problems mean that baseline and credit schemes may carry far higher transactional costs than the cap-and-trade approach, which calls into question their cost effectiveness relative to environmental outcomes.

11.39 Baseline-and-credit schemes can work well when applied to a single industry, but are more problematic when applied across the economy.

11.40 The main problem appears to be setting the baselines. Firstly, it will be arbitrary deciding what is the relevant 'peer group'. Consider the case of power stations. If all those fuelled by coal are regarded as one group, then the users of black coal will earn credits while the users of brown coal will need to buy them. If users of black coal are distinguished from users of brown coal, both types can meet the baseline. But if all power stations are treated as a group, then users of both types of coal would need to buy credits from those running on hydro power.

11.41 Secondly, if the aim is to drive reductions in emissions rather than just keep them static, another set of arbitrary decisions need to be made about how much individual industries should be required to cut.

11.42 Baseline-and-credit schemes can also be criticised for rewarding existing heavy polluters, whereas the CPRS will over time move towards being more like a 'polluter pays' system once free permits are removed.

11.43 It has been claimed that the baseline-and-credit scheme has less impact on households. But this is a mixed blessing:

If you have a scheme that suppresses the price impact on households, which I think some have advocated that the Canadian scheme does, that has the

20 Dr Martin Parkinson, Secretary, Department of Climate Change, *Proof Committee Hansard*, 18 March 2009, p 22

effect of reducing the incentive for households to reduce... the net effect is that you push the cost of the scheme up.²¹

11.44 While less common than the cap and trade approach, there are some notable examples of baseline-and-credit systems in place. Two of the emissions reduction measures already operating under the Kyoto Protocol use such a system: the Clean Development Mechanism (CDM) and the Joint Initiative (JI) project. The CDM, for example, essentially allows developed countries to gain credits by investing in emissions-reduction projects in less developed countries. These credits can then be used to meet Kyoto targets.

11.45 In Australia, the NSW Greenhouse Gas Abatement Scheme (GGAS) is also an example of a baseline and credit scheme.²² The aim of the scheme is to reduce per capita greenhouse emissions associated with electricity consumption. In simple terms, it works by imposing a declining per capita greenhouse gas target on all electricity retailers, whose emissions reduction targets are based on relative market shares. Regulated entities can comply with their targets by achieving lower-emissions energy generation or through a range of offset activities. Examples of the latter are schemes which create NSW Greenhouse Gas Abatement certificates through ensuring households use low-energy light bulbs and low-flow shower heads. These certificates can be surrendered to comply with a reduction target, or else traded amongst scheme participants.²³

11.46 While the baseline and credit model has often been applied to individual industries, most work on its application to a national emissions reduction strategy has been done in Canada. However the Canadians view it as a transitional scheme before moving to cap-and-trade.

Committee comment

11.47 Schemes based on 'intensity', such as baseline and credit, share the disadvantage with the carbon tax and McKibbin hybrid model of not setting a firm cap on emissions. In addition, setting an appropriate baseline for each industry (and indeed defining what is a distinct industry) would be a difficult task, fraught with conceptual difficulties and subject to heavy lobbying by vested interests.

21 Dr Parkinson and Mr Comley, Department of Climate Change, *Proof Committee Hansard*, 18 March 2009, p 32.

22 The ACT introduced a scheme that mirrors the NSW GGAS in January 2005.

23 For an analysis of the NSW GGAS see Robert Passey, Iain MacGill and Hugh Outhred, 'The governance challenge for implementing effective market-based climate policies: a case study of the New South Wales Greenhouse Gas Reduction [sic] Scheme', *Energy Policy* 26 (2008), pp 3009-18.

(d) Emissions trading – cap and trade based on consumption

11.48 An alternative to a cap and trade scheme based on production is one based on consumption. Former Treasury and Access Economics economist Geoff Carmody suggests a better way of avoiding concerns about carbon leakage is to have an emissions trading scheme based on consumption rather than production.²⁴ The Carmody approach has been suggested as an alternative to the CPRS by the Australian Industry Greenhouse Network.²⁵

11.49 The consumption model means the cap is being applied to indirect emissions. Direct emissions result from activities at the source, such as those arising from the manufacture of a particular good. Indirect emissions are embedded in consumed goods, such as those arising from the electricity used to produce a good or product—these emissions occur at the point at which the electricity was created (as opposed to where it was consumed).

11.50 The Government has essentially two objections to this idea; administrative difficulty and international agreements:

The Government would need to design and implement a methodology that could measure carbon emissions ‘embodied’ in a range of products and which was flexible enough to be kept up-to-date to account for new products or production methods.²⁶

The design of the Australian scheme as a production-based emissions trading scheme is intended to ensure it is consistent with our international obligations...the international community, including Australia, agreed that production, rather than consumption, should be the basis for international greenhouse gas emissions accounting rules...Calling for a new approach globally would not be seen as a constructive contribution to international efforts to reach a global solution to climate change. The Government assesses it as unlikely that the international community will support a move toward a consumption-based approach.²⁷

11.51 Professor Garnaut also rejected this model, on essentially the same two grounds.²⁸

Committee comment

11.52 The committee agrees that there are practical difficulties in measuring the emissions embedded in goods and services and prefers the more common

24 Geoff Carmody, 'Effective climate change policy: the seven 'Cs'', *Geoff Carmody and Associates Policy Notes*, no. 1, July 2008.

25 *Submission 54*, p 3.

26 *White Paper*, p 3-4.

27 *White Paper*, p 3-4.

28 *Garnaut Review*, p 327.

production-based approach that can draw on experiences with similar schemes and be more readily linked with proposed schemes elsewhere.

e) 'Command and control' regulatory approaches

11.53 All alternative approaches considered in this chapter can be characterised as regulatory approaches, in that their establishment requires direct government intervention (in the form of legislation) and that participation would be required by law. This applies equally to the CPRS, a carbon tax, or other models discussed in this chapter.

11.54 However, discussion of possible approaches generally distinguishes between command-and-control regulations (for example, by limiting emissions and/or mandating the use of low-emission or no-emission energy sources) and more market based approaches, such as emissions trading. Mandatory emissions standards for cars are examples of the former.

11.55 Such approaches can be combined with tax incentives or payments to encourage reductions in emissions. An example would be purchase rebates or lower tax for more fuel-efficient cars. Areas particularly well suited to command and control style regulation includes some forms of pollution, such as dangerous chemicals or noise pollution.

11.56 Until recently, these approaches, combined with voluntary programmes, have been the primary method adopted in Australia (although mandatory market based approaches have been attempted at state level).

11.57 However, to craft a package of regulatory measures and incentives to bring down emissions to the government's proposed 2020 target level could prove challenging, as Mr Comley from the Department of Climate Change noted:

In principle, there is a broad range of policies that would be available to government to meet emissions targets. You could go down the part of a market based scheme—that is, either a CPRS style scheme or a carbon tax. If those had been rejected, other policies available would be mainly regulatory policies. These are the sorts of policies that to a large extent have been pursued to date in the climate change mitigation area. They could include things like imposing regulatory restrictions on large or significant projects or moving to more command-and-control measures that might limit or ban certain activities. Where any government or future government may go in that area is very much a set of policy questions. If the CPRS were not imposed, you would need to look at successively more restrictive regulatory measures to achieve any target, or you could do it on the outlay side.

To put that into context, the government has announced energy efficiency measures that were part of the stimulus package. These were estimated to make a contribution to reducing emissions by around five megatons a year. If you looked at the government's target of minus five per cent by 2020,

you would need policies that would deliver around 135 megatons of emission reductions. If you are looking at the minus 15 per cent target, it is more like minus 195 megatons. So it really would be a policy question, but with[out] a comprehensive CPRS you would need a very extensive suite of measures to achieve the sorts of reductions are being considered within the government's target range.²⁹

11.58 Relying solely on such approaches is regarded by many as less efficient than market-based measures. As Professor Garnaut noted:

Regulatory, or prescriptive, approaches to reducing emissions can be haphazard. They are inevitably informed by assessments of current and future mitigation opportunities by officials, based on expectations about the rate of technological development and the changing state of consumer preferences. Such policy mechanisms have difficulty in responding to the sometimes rapid but usually unpredictable evolution of technology and consumer preferences.³⁰

Committee comment

11.59 The committee's view is that such forms of regulation may have a role to play in mitigating climate change emissions. However, it seems likely that regulatory measures will most effective when operating as a complement to a price signal, rather than a substitute for one. This is discussed further in Chapter 9.

29 Mr Blair Comley, Department of Climate Change, *Proof Committee Hansard*, 30 March 2009, p 2

30 *Garnaut Review*, p 308.