

14 AUSTRALIAN MITIGATION: OVERVIEW OF THE POLICY CHALLENGE

Key points

Australia's mitigation effort is our contribution to keeping alive the possibility of an effective global agreement on mitigation.

Any effort prior to effective, comprehensive global agreement should be short, transitional, and directed at achievement of global agreement.

The emissions trading scheme is the central instrument of Australian mitigation.

A well-designed, broadly based emissions trading scheme has important advantages over other market-based arrangements (such as carbon taxes and hybrid schemes). In particular, it is able to accommodate more easily international trade to lower mitigation costs and to facilitate developing country participation in international agreements. However a carbon tax would be better than a heavily compromised emissions trading scheme.

The role of complementary measures is to lower the cost of meeting the emissions reduction trajectories of the emissions trading scheme by correcting for market failures.

Once a fully operational emissions trading scheme is in place, the Mandatory Renewable Energy Target will not address any additional market failures. Its potentially distorting effects can be phased out naturally as the emissions trading scheme takes up the load of encouraging low-emissions technologies.

The Stern review referred to climate change as the 'greatest example of market failure we have ever seen' (Stern 2007: 1). A market failure occurs when the market alone is unable to allocate a resource efficiently, in which case it will be either over- or under-used compared to its true scarcity value. In the context of avoiding dangerous climate change, the misallocated resource is the atmosphere's limited capacity to absorb emissions.

To mitigate human-induced climate change effectively, a restriction must be placed on rights to emit greenhouse gases to the atmosphere. This limit must be reduced over time to the level that prevents any net accumulation in the atmosphere.

This chapter outlines the nature of the domestic mitigation challenge and offers a framework for considering how Australian policy makers should approach this task. Consequently, this chapter serves as a bridging point between the earlier and later chapters of this report. Chapters 3 to 10 present

the global and Australian impacts of climate change and a policy framework for considering those impacts. Chapters 11 to 13 discuss the challenges and policy options for reaching a global agreement on limiting greenhouse gas emissions. Chapters 15 to 20 discuss a range of policy interventions.

There would be no point in Australia alone introducing mitigation policies. The entire purpose of Australian mitigation is to support the emergence of an effective global effort.

Is a comprehensive international agreement to reduce global greenhouse gas emissions possible or likely?

Reaching a comprehensive international agreement will not be easy, but there is a chance that Australia and the world will manage to develop a position that strikes a good balance between the costs of dangerous climate change and the costs of mitigation. The consequences of the choice are so grave that it is worth a large effort to take that chance while we still can. A significant mitigation effort by Australia and other developed countries is the cost of preserving some hope of a more comprehensive international agreement for avoiding dangerous climate change.

How Australia defines and implements its mitigation policy will establish its credibility and its place in negotiating a global agreement.

Nevertheless, until there is a comprehensive international agreement, there will be little difference between gross and net costs to the Australian economy from domestic mitigation policy. There will be no countervailing benefit arising from climate change avoided. Setting emissions limits will rely on a series of judgments about the value of Australia, with other wealthy countries, moving ahead of a comprehensive global agreement.

The period of Australian mitigation effort before there is an effective global effort will be short, transitional and directed at achievement of a sound global agreement. Section 14.1 therefore proposes a number of emissions trajectories, which balance the requirements of developed country policy leadership, with the costs of acting ahead of a comprehensive global agreement.

The supplementary draft report will provide estimates of the cost of unilateral mitigation as well as the costs and benefits of a global approach to reducing emissions. The modelling analysis now under way will enable the Review to provide guidance on the setting of interim targets in the supplementary draft and final reports.

Having established as a policy objective the reduction of Australia's greenhouse gas emissions according to a set of trajectories (and the conditions by which those trajectories might be changed), governments will have a range of implementation options for limiting emissions (see section 14.3). Chapter 15 discusses the preferred design features for an Australian emissions trading scheme in detail.

14.1 Emissions entitlement limits for Australia

Australia's average annual emissions entitlement limit under the Kyoto Protocol is currently 108 per cent of 1990 emissions over the period 2008 to 2012. There is no Australian limit for the post-2012 period. There is some prospect that one will be agreed as part of current negotiations for the second Kyoto commitment period, but this cannot be guaranteed. In any case, post-2012 limits need to be established quickly for the emissions trading scheme, since the latter will be derived from the former. (Because not all sectors will be covered by the scheme, the two will not be equal.) How then to determine an emissions limit for the post-2012 period in an environment of uncertainty?

Chapter 11 argued that developed countries should take a dual approach to the setting of carbon reduction goals. An initial commitment (or offer), set unconditionally, would meet the requirement that richer countries show leadership on climate change mitigation by going first. Another, more ambitious, offer would represent what Australia would be prepared to do in the context of effective, global action involving all major emitters. This would be Australia's conditional offer within an international negotiation.

Making both the initial commitment and the subsequent offer conditional on the basis of an assessment of comparative effort would ensure that Australia was playing its full role, without being isolated—either in front of or behind—other developed nations. Using the logic of the dual approach, Australia's initial commitment would be comparable with proposals put forward by other developed countries. The more ambitious conditional offer would be comparable with the efforts required by all major emitters in an effective response to climate change.

In Australia, adoption of emissions commitments also requires analysis of the domestic economic costs to ensure that they are feasible, and also justified by the benefits of mitigation. Since the modelling of economic costs is still under way, the Review's recommendations on emissions limits are reserved for the supplementary draft and final reports.

Subject to modelling to establish economic feasibility and desirability, Australia's initial emissions limit for the post-2012 period would be a limit comparable to those of other developed countries. When and if an international agreement is in place, Australia would adopt the limit agreed for it as part of that agreement.

Because Australian action alone will be of little consequence to climate change impacts, there seems to be no case for adjusting Australian limits for new information and developments of an economic or scientific kind. The changes to tighter trajectories would be triggered by developments in international policy. International policy discussion would consider changes in the science or the

economics. As Australia revises its emissions limits in response to international agreements, the revisions would indirectly reflect scientific or economic developments.

Emissions goals are typically announced as end-point targets. There are two key end points in the current international discourse, 2020 and 2050. So as to influence the international dialogue, it would make sense for Australia's initial and conditional offers be made in terms of these end points. However, as discussed in Chapter 12, different trajectories to the same end-point target can give rise to very different cumulative emissions (that is, the carbon budget) and greenhouse gas concentration levels. The end-point targets should be defined simultaneously with trajectories for the release of permits to that point.

The ultimate trajectory of Australia's emissions limits will be given by successive commitment periods of the Kyoto Protocol and successor international agreement. For example, if the Kyoto Protocol is followed with five-year commitment periods then it will contain limits for emissions entitlements for 2013 to 2017, 2018 to 2022, 2023 to 2027, and so on. Over time, for the mitigation effort to be effective, successive commitments will need to be known in advance through the adoption of more explicit allocation criteria.

Since these variations to the emissions limit cannot be known in advance, the Review considers that smooth indicative trajectories should be defined between the end points, that is, between 2012 and 2020, and 2020 and 2050.

An emissions trajectory may take any number of paths:

- A linear movement from one point in time, to another in the future. This embodies a steadily increasing annual percentage rate of emissions reduction as the level of emissions declines. The European Union has opted for this approach (European Commission 2008).
- A concave curve, that begins with a more gradual emissions reduction in the early years, and then sees reductions occurring with increasing speed later. Such an approach may reflect an expectation of a highly efficient, low-emissions technology becoming available in later years.
- A convex curve would be the opposite, with steep emissions reductions occurring early, and the rate of reduction slowing later. This could reflect the assumption that there was ready access to 'low-hanging fruit' for reducing emissions in early years.
- A different shape determined, for example, through economic modelling, as the least-cost rate of emissions reduction. This would be subject to a range of limitations, and depend heavily on arbitrary assumptions, for example, on the rate of technological improvement.

There seems no strong rationale for preferring one shape of trajectory over others, provided that they define identical emissions budgets over time. Because there will be a deviation in actual emissions from any trajectory chosen (due to

the prospect of hoarding, lending and trade, as discussed in Chapter 15), a linear trajectory is preferred for reasons of simplicity.

The linear trajectory for the emissions trading scheme proposed in Chapter 15, which would be derived from the overall limit, would be firm for a period of five years. That is, the scheme's emissions limit would be guaranteed or fixed for a period of five years and updated every year by one year (see section 15.2). In the years beyond the five-year outlook, the trajectories would be indicative only.

If, for some reason, Australia's international obligations were to change within the fixed five-year period, the Australian government would have to manage that change without changing the scheme's limits for the following five years. Any shift to a different trajectory for the scheme that was commenced in 2011 (for example, one that reflects a new international agreement) would only commence in 2016. Following this logic, the initial trajectory, based on the unconditional offer, would provide the basis for an aggregate limit for the emissions trading scheme from 2013 until at least 2015 (assuming the market commences in 2010). The Australian Government would need to take responsibility for purchasing international permits to cover any underperformance on agreed targets in the intervening years.

The ongoing relevance of the initial and conditional offers would need to be reassessed from time to time. Say, for example, that there were no comprehensive international agreement until 2020 (rather than from 2012). Then the conditional goal announced by Australia in 2008 might no longer be relevant. Likewise, if there were no progress towards an effective international agreement over the next decade, and if other developed countries failed to adopt or implement emissions reduction commitments, then Australian mitigation policy might need to be reassessed. This situation would require a less stringent emissions trajectory. The need for less or more stringent emissions trajectories would be reviewed with each material change in the international policy context.

Some countries and regions have moved to provide legislative backing to their emissions limits. This approach would have the advantage of reducing uncertainty, and providing a clear framework within which goals and trajectories could be changed.

14.2 Addressing the greatest market failure ever seen

The options for meeting the policy objective—reducing Australia's greenhouse gas emissions in a manner that reflects the atmosphere's true scarcity value—are typically categorised as being either regulatory or market based. Within these two categories, numerous policy instruments can be applied.

14.2.1 Regulatory responses

Regulatory responses to the mitigation objective work by either:

- mandating restrictions or banning particular items from the set of product choices available to consumers, and/or
- mandating, licensing or banning particular technologies or production techniques used by local firms.

Prescriptive approaches to reducing emissions can be haphazard. They are inevitably informed by officials' assessments of current and future mitigation opportunities, based on expectations about the rate of technological development and the changing state of consumer preferences. They are inevitably poorly based, and have difficulties in responding to the evolution of technology and consumer preferences.

14.2.2 Market-based approaches

Market-based approaches seek to alter price relativities in a way that reflects the externality embedded in goods and services—that is, direct and indirect emissions arising from the production and distribution process. Consumers are left to choose whether, when and how to substitute from high to low carbon-intensive products. As they do so, firms begin responding to new consumption patterns by investing in alternative technologies and new products.

Governments cannot simultaneously control both the price and the quantity of emissions. The choice of approach should take into account the importance placed on having control over the level of emissions, relative to the importance attached to being able to control the emissions price.

Four market-based approaches are reviewed below.

Emissions (or carbon) taxes

The administratively simplest pricing mechanism is to impose a tax on emissions, typically known as a carbon tax. Carbon taxes are straightforward to apply and avoid the need for governments to take discretionary decisions about who ought to be allowed to emit. Carbon taxes also provide certainty about the marginal costs of mitigation.

However, while avoiding the arbitrariness of regulatory interventions, the meeting of emissions reductions targets cannot be guaranteed. Compatibility with other systems internationally may also be limited. Moreover, the achievement of ongoing and increasing reductions in accordance with one of the trajectories outlined in section 15.2 would require variation of the carbon tax rate on the basis of continuing reassessment of the relationship between the rate of the tax and the level of emissions.

Emissions trading scheme 1: cap and trade

Under a cap and trade scheme, government issues tradable permits that allow the holder of the permit to emit a specified volume of greenhouse gases to the atmosphere. A permit is an instrument with clearly established property rights. The sum of all permits on issue equates to the total greenhouse gases that may be emitted to the atmosphere. Permits are issued according to the trajectories discussed in section 14.1.

The issuing of permits may involve government auction, or free allocation to particular parties. The decision about how to allocate permits involves a judgment over the allocation of the rent value of the permits.

Trading between parties allows permits to move into the hands within which they have greatest economic value.

As permits are traded, the price comes to reflect the balance between scarcity of permits and options to abate. The price is the balancing variable between the supply of, and demand for, permits. The price is determined by the market, not the government. It may entail some volatility, especially at the outset of the scheme when there is no or limited experience about abatement responses and costs. A well designed scheme will not eliminate volatility in the permit price but it can avoid the unnecessary dissipation of resources arising from second-guessing of policy makers by market participants.

Poor design would put at risk the environmental effectiveness and the economic efficiency benefits that are the reason for establishing an emissions market (see Chapter 15).

A cap and trade emissions trading scheme requires rules governing:

- the limit on emissions
- the creation and issuance of permits
- who must or can participate in the scheme
- the means by which permits are exchanged between buyers and sellers
- the timing and method of acquittal of obligations
- the consequences for non-compliance
- the roles of government and other bodies in operating the scheme.

Sectors not covered by the scheme can participate by creating offsets that can be sold to liable parties within the scheme. This provides incentives for mitigation beyond the scheme. As discussed in Chapter 12, cap and trade schemes also provide greater potential to access least-cost abatement opportunities internationally.

Emissions trading scheme 2: baseline and credit

Baseline and credit schemes also rely on the creation of tradable permits. These schemes differ from cap and trade schemes in that they effectively place the creation of permits in the hands of private parties (existing emitters) rather than the government.¹

The baseline feature of these schemes involves an algorithm that provides existing emitters with some level of entitlement to emit. If their actual emissions are below this entitlement, then the surplus entitlement is converted into tradable permits (or credits). Emitters that exceed their entitlement must purchase permits to account for any emissions above their respective baseline.

Options for calculating the baseline entitlement include:

- emissions in a particular base year
- average emissions per unit of production based on installed technology in a base year
- average emissions per unit of production based on best practice technology
- any combination of these or other approaches.

The choice of algorithm introduces a high and unavoidable degree of arbitrariness into the design of a baseline and credit scheme. This would raise transaction costs and encourage rent-seeking behaviour (as the entire rent value of permit scarcity accrues to existing emitters).

Hybrid schemes

Hybrid models address the tension between wanting certainty in both price and quantity. The basic feature of these models is the establishment of an emissions trading scheme (cap and trade) with an imposed upper limit on the price of permits (McKibbin & Wilcoxon 2002; Pizer 2002). This involves initially issuing tradable permits up to a cap, but with a commitment by government to issue unlimited amounts of extra permits at a specified ceiling price.

Like the carbon tax, the hybrid approach with a ceiling price has the advantage of providing certainty about the maximum permit price while preserving some aspects of an emissions trading scheme to the extent that the market price can be expected to remain below the cap. However, it also combines the disadvantages of both worlds. In particular, the full institutional and administrative apparatus—and therefore cost—of an emissions trading scheme is required, without any guarantee of the required domestic emissions reductions. The use of ceiling prices would create a problem for Australia's role and credibility in international mitigation negotiations, since it would not allow firm commitments on levels of emissions.

A floor price for permits would require the scheme administrator to enter the market to purchase permits whenever the permit price fell below a specified value. A floor price is incompatible with international trade in permits as it would effectively create an unlimited liability for the Australian scheme administrator.

Ceiling and floor prices would dampen the incentive for development of secondary markets. The emergence of these markets is important in transferring risk to the parties best able, and most willing, to manage it.

14.2.3 The preferred approach for Australia

In determining the preferred approach for Australia's mitigation effort, the primary policy objective must be to meet a specified trajectory of emissions reductions at the lowest possible cost. Policy must be designed to facilitate this transition to a lower-emissions economy, with as little disruption as possible and at least cost to the overall economy.

Australian mitigation policy needs to be considered in the international context of action and commitments. The world is now some way down the track towards an international system based on emissions reduction targets, starting with developed countries. Regulatory approaches, carbon taxes, hybrid schemes and baseline and credit schemes would not be readily integrated with existing and emerging international arrangements that could provide Australia with lower-cost mitigation opportunities.

A well-designed emissions trading scheme (cap and trade) can be relied upon to constrain emissions within the specified emissions limit (or trajectory). Current as well as future prices are set by the market, without the need for bureaucratic clairvoyance in relation to prices or mitigation options and costs.

As with any policy intervention, an emissions trading scheme will involve transaction costs that represent a deadweight loss to the economy. Chapter 15 discusses optimal scheme design in detail. A well-designed emissions trading scheme needs to be free of disputation over key parameters and cannot provide opportunities for special interests to exert political pressure for favourable treatment—most notably, permit allocation. Policy makers would be better off to abandon an emissions trading scheme in favour of a broad-based emissions tax if they felt unable to resist pressures on the political process for ad hoc assistance arrangements.

With a well-designed and comprehensive emissions trading scheme in place, price signals will begin flowing through the economy reflecting the scarcity value of the emissions of greenhouse gases to the atmosphere. Consumers will begin modifying their behaviour and businesses will respond accordingly.

The scale and scope of this reform agenda cannot be underestimated.

14.3 Mitigation policy: a broader reform agenda

The emissions trading scheme will correct the biggest market failure by establishing the right to emit greenhouse gases to the atmosphere as a tradeable commodity. It is the most direct instrument for securing Australia's emissions reductions, if properly designed and allowed to play its role without extraneous interventions (for example, by attempts to control the permit price).

The supply side of the market is represented by the government-controlled issuing of permits in accordance with an agreed emissions reduction trajectory. As such, the Australian emissions profile is capped by the force of law and no further measures are required to control national emissions in covered sectors.

On the demand side are all the goods and services whose production or consumption results in the release of emissions. The demand side of the market is given force by the government requiring emitters to acquit permits if they wish to release greenhouse gases to the atmosphere. In so doing, the government must have the administrative machinery to enforce such a requirement credibly.

14.3.1 Understanding the impact of an emissions trading scheme

A fully functioning market mediates between the variety and priority of wants of consumers and the productive capacity of the economy. There are innumerable decisions by households and firms that determine the demand for permits. The price of permits will be determined by the balance between demand for, and supply of, permits.

A credible market will establish a forward price for permits that reflects expectations about the future demand for permits. The price rises at a rate of interest corresponding to the opportunity cost of capital.^{2,3} The whole price curve—the spot price and all of the forward prices, together—embody the market's expectations of what is required to induce the necessary substitution of low-emissions alternatives for high-emissions goods and services, and for economising on the use of goods and services that incorporate high proportions of emissions.

The price curve provides fundamental stability to the market, with opportunities for hedging price risks, and adjusting quickly to new information. Any change in expectations in demand or supply or in the interest rate would see the spot and forward prices adjusting immediately.⁴

Economic effect of an emissions price

The emissions price flows through the economy in two ways.

First, it causes the substitution of higher-cost, low-emissions processes or goods and services for lower-cost established processes, goods and services. The former is a real cost to the economy as it involves the reallocation of resources to uses that would not otherwise have attracted them.

This substitution effect gradually decouples economic growth from its former reliance on processes and products with high greenhouse gas emissions. If permits are defined so that there is flexibility about when they are used (that is, allowing hoarding and lending as defined in Chapter 15), there is less price volatility, and the market can determine the optimal timing of use of permits.

Even though the price of permits can be expected to continue increasing, as reflected by the forward price curve, the proportion of the economy exposed to this higher cost will be ever-diminishing. Once substitution of some new lower-emissions for a higher-emissions process (or product) has been induced at a specified permit price, technological and institutional improvements and scale economies in the new process (or product) are likely to lead to relative cost reductions over time.

The second way in which the emissions price will flow through the economy is by generating rents from the scarcity of the permits. This involves a transfer of wealth from the economic agent to whom the price is ultimately transferred (in some cases businesses, but mostly households), to whomever receives the scarcity rents of the permits (established emitters if the permits are simply given to them; or to the government in the first instance, and then to the beneficiaries of reduced taxation or increased public expenditure, if the permits are sold competitively).

On the basis that this major environmental reform—the introduction of the emissions trading scheme—is not meant to arbitrarily increase the proportion of the economy under the control of the public sector, the proceeds of the sale of permits should be identified for return to the community, either to households or to business. Demonstration that revenues from the sale of permits had been returned to the private sector in one way or another would neutralise what could otherwise become a rallying point for opposition to effective mitigation policies.

Detractors of market-based mechanisms often argue that additional emissions reduction measures (be they regulatory or programmatic) are required in order to reduce greenhouse gas emissions. They are wrong.

Programs and other regulatory interventions—whether federal, state or territory—that seek to reduce emissions from specific activities within the community will not reduce emissions below the levels determined by the trajectory defined for the emissions trading scheme.

Under a cap and trade emissions trading scheme, emissions will not exceed the adopted emissions reduction trajectory unless private parties have contravened the law. If the sum of all decisions across the economy implies demand for emissions is in excess of supply, the price of permits will increase, and continue to increase, until demand is subdued and brought into line with the quantum of permits on issue.

Integration of the scheme within the broader economy

For the emissions trading scheme to have the desired effect of driving new consumption behaviour and investment decisions, it must be well integrated within the broader economy. Barriers to change must be removed or minimised in order that there may be an efficient economic response to the ever diminishing supply of permits.

The introduction of an emissions trading scheme, then, needs to be accompanied by a commitment to a broader economic reform process—one that allows carbon price shocks to dissipate across the economy quickly and smoothly.

Modelling major economic reform

As with all reform agendas, the commitment by government and the community must be ongoing and firm. Decisions must be made even in the face of unknown prospects for an international agreement and some uncertainty about how the domestic economy will respond. Economic modelling can be of some assistance. Building on the results reported in Chapter 9, the Review is undertaking further modelling of the costs of mitigation and the economic benefits from the climate change avoided. This will be an important input into the Review's consideration of interim targets for Australia's emissions reduction trajectory.

Modelling economic reform is always difficult. By definition, reform programs are intended to alter fundamentally some set of economic relationships within the economy. On the other hand, economic models are built upon known and measurable past behaviours. Experience shows that once economic agents have accepted the inevitability of change, they will alter their behaviour to account for the new conditions more efficiently and effectively than previously predicted. This experience suggests that economic models are likely to underestimate the benefits or overestimate the costs of economic reform. This bias may be further exacerbated by lack of data about the full costs of climate change impacts and a corresponding downward bias in the estimated benefits of avoiding climate change.

In the case of this reform, there is a possibility that costs will be higher than anticipated by standard models, because of the danger that it will promote a large diversion of resources away from commercially focused profit maximisation, towards seeking favours in permit allocation from governments. Avoidance of such outcomes should be a major objective of scheme design.

This lack of knowledge about how consumers and producers will respond should serve to constrain the ambitions of those who expect government not only to impose an emissions limit on the domestic economy, but also to manage the economy's response.

Policy makers must take care when determining the overall emissions reduction goal. If they determine the goal solely on the basis of assumed technological developments and known consumer preferences at a particular moment, they will probably underestimate the true potential of the economy to reduce emissions in the future—that is, overestimate the price of permits and the economic cost of adjustment. This course of action risks raising political resistance to the reform agenda. On the other hand, goal-setting that is based on assumptions about unknown technologies and unobserved preferences runs the risk of overestimating the capacity of the economy to adjust. Economic

modellers and policy makers will tend to err on the side of caution, preferring the former approach (that is, modelling on the basis of existing technologies and known preferences).

14.3.2 Viewing mitigation as a reform agenda

Australians are well placed to deal with the challenges of this economic reform agenda. The reforms of the past have made the Australian economy more open, market-oriented and adaptable than at any time in its history. We have a good record in institutional design and in establishing genuinely independent agencies to implement those arrangements. In the case of an emissions trading scheme, we have the benefit of learning from schemes that have been implemented internationally, most notably, the three phases of the European Union's scheme.

Although it is tempting to compare the mitigation challenge to earlier Australian programs of economic reform, we must exercise caution here. Previous reforms—such as trade liberalisation, financial regulation and competition policy—were targeted at raising incomes by allowing the allocation of resources to their most productive uses. By contrast, the climate change reform agenda must be focused on minimising the potential for loss of income after the introduction of measures to limit the release of greenhouse gases.

As with all reform programs, altering pre-existing economic relationships within the economy is likely to generate winners and losers. Consumers who are willing and able to replace higher-emissions products with lower-emissions products will adjust relatively painlessly. Firms with less dependence on emissions-intensive production processes, or which have the ability to switch production process quickly in order to minimise their exposure to a carbon price, may find that their market share and profitability increase. Firms that have less flexible capital structures could be faced with having to choose between passing on the price (and losing market share) or absorbing the price of emissions at the expense of profitability. All things being equal, such firms may face some loss of market value.

As with all programs of economic reform, mitigation policy must be forward-looking. Policy interventions and the use of scarce resources should focus on improving future economic prospects rather than reacting to past decisions by governments or the private sector.

While it is not possible to foreshadow all the demands that will be placed on the revenue raised from the sale of permits, the case for compensatory payments to shareholders in firms that lose value is a relatively low priority for a number of reasons.

First, it will be difficult or impossible to assess the effects of the emissions trading scheme on an individual firm's profitability as the counterfactual supply

and demand conditions in those markets cannot be observed. The potential information asymmetry problem would lead to disputation.

Second, there is no tradition in Australia for compensating capital for losses associated with economic reforms of general application (for example, general tariff reductions, floating of the currency or introduction of the goods and services tax) or for taking away windfall gains from changes in government policy (for example, reductions in corporate income taxes).

Third, alternative forms of assistance such as structural adjustment assistance that is targeted at the future competitiveness of firms (or in some cases, regions) is likely to provide a greater benefit to the overall economy than a backward looking, private compensatory payment to existing emitters (see following discussion on market barriers).

Fourth, this is a difficult reform, and a permit price that is high enough to secure levels of emissions within targets and budgets will have major effects on income distribution—including workers and communities dependent on emissions-intensive industries that may be unable to adjust readily to alternative employment. Directing scarce resources towards addressing these impacts will be a significant challenge and an unavoidable priority. There will also be large calls on the revenue from sale of permits for support of research, development and commercialisation of new low-emissions technologies, and for avoiding 'carbon leakage' through payments to trade-exposed, emissions-intensive industries.

Stationary energy, which in Australia is a particularly large source of emissions, is the dominant industry with expectations of compensation. It is the subject of detailed discussion in Chapter 20.

Trade-exposed, emissions-intensive industries

Trade-exposed, emissions-intensive industries represent a special case. All other factors being equal, if such enterprises were subject to a higher emissions price in Australia than in competitor countries, there could be sufficient reason for relocation of emissions-intensive activity to other countries. The relocation may not reduce, and in the worst case may increase, global emissions. This is known as the problem of carbon leakage.

Policy makers are therefore faced with a truly dreadful problem. Shielding these industries from the effects of a carbon price either undermines attempts to limit national greenhouse gas emissions or it increases the adjustment burden elsewhere in the economy.

Chapter 13 outlines the benefits of sectoral agreements in avoiding this problem while Chapter 15 suggests that Australia will need to show global leadership in pursuing such arrangements. Failing this outcome, Australia is faced with implementing special domestic arrangements (see Chapter 15). These transitional arrangements would be based on efficiency in international resource allocation and not on some false premise of compensation for lost profitability. There can be no doubt that the inherent arbitrariness of such assistance

measures will make them the subject of intense lobbying, with potential for serious distortion of policy-making processes. Their continuation for more than a few years would be deeply problematic. The establishment of comparable carbon pricing arrangements in countries that compete with Australia in global markets for emissions-intensive products is an urgent matter.

14.3.3 Addressing the relationships between an emissions trading scheme and other policies

A variety of policies have been discussed or put in place with the aim of reducing greenhouse gas emissions from the sectors to be covered by an emissions trading scheme. The scheme is expected to deliver required reductions in emissions. Other policies operating alongside an emissions trading scheme can have no useful role in reducing emissions once the emissions trading scheme is in place. From that time, the only useful role for additional policies of this kind is to reduce the effect of market failures in adjustment to the emissions price, so as to reduce the cost of adjustment to the low-emissions economy. Rather, other policies should allow the scheme to achieve its emissions reduction goal at a lower cost than would occur if the scheme was operating alone.

The Mandatory Renewable Energy Target and the emissions trading scheme

The Mandatory Renewable Energy Target (MRET) was introduced in 2000 to drive the uptake of renewable energy and reduce emissions. MRET operates by placing an obligation on energy retailers to purchase a proportion of their energy from renewable sources in the form of renewable energy certificates. The value of a certificate is equal to the difference in the cost of producing the renewable energy and the average wholesale price of electricity. By design, MRET causes deployment of the lowest-cost eligible technologies. To date, the increase has been mostly wind and solar hot water. As renewable energy production is currently more expensive than alternative sources, this higher cost is passed on by retailers to households and businesses.

An important design feature of MRET is the shortfall penalty of \$40/MWh, which operates as a cap on the certificate price. The shortfall penalty is not indexed. To date, the price cap has been largely untested because, although the price of renewable energy has been increasing, the average wholesale price of electricity has been increasing at a similar rate.

MRET is set to expand from the current 9500 gigawatt hours to 45 000 gigawatt hours (around 20 per cent of energy demand) by 2020. The expanded MRET will drive increasingly expensive options for the deployment of currently favoured technologies (for example, building wind farms in more remote areas) as well as the deployment of newer and more expensive technologies (such as geothermal and solar photovoltaic). This will lead to a higher renewable energy

certificate price and higher electricity prices for consumers. Conversely, the recent uplift in world energy prices (coal and gas) raises the average wholesale price of electricity and puts downward pressure on the certificate price.

The emissions trading scheme differs in objective and operation from MRET, in that it caps the level of emissions and is neutral as to how that is achieved. The market is left to determine how the necessary reductions will be achieved. In some cases, this may lead to investment in renewable energy production, but in other cases it may lead to fuel switching or the deployment of more efficient operating practices among existing energy producers. The market, rather than government, is left to find the solution. A competitive market can be expected to deliver these emissions reductions at the lowest cost to the community and business.

Implementing the expanded MRET alongside the emissions trading scheme means that these two policy instruments, with their differing objectives, will be interacting in the electricity market. This clash of objectives will potentially be detrimental to electricity users (households and businesses) and electricity producers (incumbent and new providers). Many factors will affect the extent of this adverse interaction. The most notable is the trajectory of the emissions trading scheme and the ramp-up rate of MRET (see Table 14.1). Both schemes must, by force of law, meet their mandated targets. The concerns are threefold: What is the cost? Who will bear the cost? What are the long-term consequences?

On balance, the Review considers that carrying forward the existing, non-indexed shortfall penalty of \$40/MWh into the expanded MRET provides the best opportunity for a smooth transition from MRET into the broader emissions trading scheme. The units of account are different for MRET and the emissions trading scheme, but it happens that \$40/kWh in MRET under current conditions roughly corresponds to \$40 per tonne of CO₂-e in the emissions trading scheme. Since the price cap is a feature of the current MRET, its retention would seem to be fully consistent with the government's commitment on the MRET. As the price of permits increases above \$40–45 per tonne of CO₂-e, the emissions trading scheme would come to dominate investment decisions and the economic effects of MRET would be subsumed within the emissions trading scheme.⁵ Maintaining the shortfall penalty will place an upper limit on MRET's higher costs relative to the emissions trading scheme, and on electricity prices, while maintaining the incentive for investment in renewable energy that can be delivered below this level. Furthermore, as the emissions trading scheme takes over from MRET, some of the rents previously accruing to investors in renewable energy (who will now be competitive with other forms of carbon-intensive energy) will shift to government and can be used to support research, development and commercialisation of newer technologies (see Chapter 16).

Modelling will be important to provide some indication of likely impacts of MRET on the permit prices and mitigation occurring under the emissions

trading scheme. It will be critical that the interactions between MRET and the emissions trading scheme are fully understood when the parameters of the scheme are being finalised. These matters will be discussed quantitatively in the supplementary draft report.

Table 14.1 Interaction between the emissions trading scheme and the Mandatory Renewable Energy Target

		MRET ramp-up rate	
		Gentle	Aggressive
Emissions trading scheme trajectory	Gentle	<ul style="list-style-type: none"> • Low permit price • Moderate renewable energy certificate price • Moderate impact on retail electricity prices • Abatement activity outside MRET unlikely 	<ul style="list-style-type: none"> • MRET cannibalises emissions trading scheme • Very low (even zero) permit price • Emissions trading scheme becomes non-functional • High renewable energy certificate price • High impact on electricity prices • Little abatement activity outside MRET • No incentive for investment in other low-emissions technologies
	Aggressive	<ul style="list-style-type: none"> • Permit price steadily increases over time • As wholesale electricity prices rise, renewable energy certificate prices decline, possibly to zero—implying early phase-out of the MRET • Moderate-to-high impact on retail electricity prices—depending on level of mitigation undertaken elsewhere in the economy • Investment in portfolio of renewable and other low-emissions technologies 	<ul style="list-style-type: none"> • Permit and certificate price paths would be highly dependent on interaction of the two schemes • Prices could be range from high to very low • MRET most likely to cannibalise emissions trading scheme • High impact on retail electricity prices • Most investment likely to be in increasingly expensive renewable energy options

Greenhouse Gas Reduction Scheme

The New South Wales Greenhouse Gas Reduction Scheme (GGAS) is one of the world’s first mandatory greenhouse gas emissions trading schemes, originally designed to run until 2012.

Both the emissions trading scheme and GGAS cause a price to be applied to greenhouse gas emissions associated with energy consumption. It is not efficient or appropriate to have multiple emissions price signals. Therefore, NSW legislation provides that GGAS will cease to operate upon commencement of the emissions trading scheme (NSW Department of Water and Energy 2008).

There are several issues to consider in ensuring a smooth transition from GGAS to the emissions trading scheme, including:

- Treatment of accredited abatement providers. If emissions reduction projects under GGAS were not reaccredited at all under the emissions trading scheme, or they were reaccredited but scheme permit prices were lower than certificate prices under GGAS, this could reduce the income stream and project value.

- Forestry carbon sequestration projects. Reaccreditation under the emissions trading scheme would be necessary, and depend on rules developed for the inclusion of forestry in the emissions trading scheme.
- Unused GGAS certificates, which may be held by existing providers, intermediaries or parties with an obligation. Transition arrangements should not provide an incentive for oversupply of certificates, or holding of them in expectation of a higher price under the emissions trading scheme (and non-compliance with GGAS).

The voluntary market for emissions reductions

There is a growing market for individuals, households and businesses wishing to voluntarily purchase credits for greenhouse gas reductions, to offset emissions associated with their activities. Such measures include the purchase of Green Power, and offset credits from the Commonwealth Government Greenhouse Friendly program.

As the emissions trading scheme develops, both in depth and breadth, it is likely to cannibalise the market for such measures, although the nature and pace of such changes are uncertain.

Voluntary demand for offsets is likely to continue even with an emissions trading scheme. For example, the South Australian Government believes offsets will play a role in meeting its commitment to be carbon neutral by 2020 (Government of South Australia 2008).

Robust standards for voluntary offsets are important. It is likely, and desirable, that the voluntary emissions market will move increasingly toward the compliance market, in terms of standards.

As well as buying domestic offset credits, under an emissions trading scheme those looking to purchase emissions reductions voluntarily may buy and surrender compliance-grade credits, including emissions permits and domestic and international offset credits.

Electricity pricing

Consideration will need to be given to existing power purchase agreements with fixed prices, or which are silent on or prohibit the pass through of a carbon price. Early announcement of the emissions trading scheme design will allow retailers and customers to better manage the uncertainty about future carbon prices in new contracts. Parallels with issues that arose in relation to the introduction of the goods and services tax at the turn of the century will be helpful in the management of this transitional issue.

Electricity pricing issues are discussed further in Chapter 20.

14.3.4 Addressing market failures and other barriers to reform

While an emissions trading scheme will address the primary market failure of unpriced greenhouse gas emissions, other market failures have the potential to raise the economic cost of the structural adjustment process. Three market failures must be vigorously addressed if the benefits of an emissions trading scheme are to be maximised.

First, the market failure associated with research and development and innovation (or commercialisation of new technologies) must be corrected. Policies are required that recognise that private investors are not able to capture for themselves the full social value of their innovations. There is therefore a need for high levels of public expenditure on research, development and commercialisation of new, low-emissions technologies and approaches. Public assistance must be introduced in different forms for different stages of the innovation process.

Second, governments must address the possibility of market failures associated with the external benefits from pioneering investment in the provision of network infrastructure related to electricity transmission, natural gas pipelines, carbon dioxide pipelines associated with geosequestration, and transport infrastructure linked to urban planning. This may or may not require public expenditure.

Third, there are market failures in end use of energy, as a result of misplaced incentives, and externalities in gathering and analysing information. Correcting this market failure would reduce energy consumption and lower the overall demand for permits. Government intervention would include mechanisms for subsidising the provision of information related to innovation in reducing the demand for energy, and regulatory responses where these were the most efficient means of correcting market failures in information.

These market failures are addressed in chapters 16, 17 and 18 respectively.

A comprehensive mitigation strategy will also require government intervention to promote abatement activity in sectors not covered by the emissions trading scheme. The scheme's coverage should be as broad as possible as quickly as practicable. Sectors that are not expected to be covered should be provided with incentives and be allowed to interact with the scheme through other measures—most notably, the creation of offsets (see Chapter 15). The most significant opportunities may be in the area of improved carbon sequestration through better management of soil carbon.

The ideal mitigation strategy would embody measures that correct the tendency for regulatory and institutional arrangements, and policy uncertainty, to create significant barriers to change.

As already noted, governments will need to review existing policies to ensure that they do not adversely interact with the emissions trading scheme. Reviews should cover federal and state taxes and subsidies, procurement policies, industry assistance programs, product and technology standards, accounting standards and taxation rules. Such reviews will need to extend beyond programs and policies that directly compete with the emissions trading scheme for emissions reductions. The aim should also be to identify perverse incentives that might inadvertently inhibit investment in low-emissions technologies or promote activities associated with high emissions.

While Australian mitigation policy must be viewed as a wide-ranging reform agenda, it should also be considered within the broader economic context.

Commitments already exist for reducing the regulatory burdens on business, expanding investment in infrastructure, reviewing federal tax arrangements and reforming Australia's approach to human capital formation. The successful implementation of these other policy reform programs would assist the introduction of the emissions trading scheme.

As a market-based measure, the efficiency benefits of an emissions trading scheme will be enhanced by a broader suite of market-oriented reforms. Measures that seek to promote the development of global and domestic markets for products and commodities (beyond carbon) will assist in dissipating carbon price shocks, whether they originate in Australia or beyond.

Finally, a national emissions trading scheme must be the centrepiece of Australia's efforts to reduced greenhouse gas emissions. However, this should not be equated to the centralisation of all policy interventions relevant to the national emissions abatement challenge. State and territory governments have an important part to play in removing barriers and promoting broader reforms in areas within their jurisdiction. The division of responsibilities in the Australian federation will be discussed more fully in the final report.

14.4 Income distribution effects

As a market-based instrument with broad application, the emissions trading scheme can be expected to be environmentally effective and economically efficient, but will be poorly placed to deal with matters of equity. Individuals and households will be affected by its introduction to the extent to which firms pass on higher input costs in the form of higher prices. Regions and communities will be affected to the extent that they are dependent on particular emission-intensive industries or firms. Chapter 19 discusses distributional impacts and appropriate policy responses.

Notes

- 1 The Greenhouse Gas Reduction Scheme (or GGAS) established by the NSW Government, which has been in operation since 1 January 2003, contains elements of a baseline and credit scheme. GGAS was a world first but is relatively small in scale.
- 2 This is because investors will be choosing between alternative investments, with an emissions permit being one possible investment. Investors will assess whether the long-term value of holding an emissions permit is higher or lower than the return from an alternative investment. This leads to selling or buying of emissions permits until a forward price curve emerges that causes the expected return from holding a permit to be equivalent to that on alternative investments. The price would therefore rise at a rate of interest corresponding to alternative investments available to holders of permits.
- 3 Incidentally, it is a common error to see a rising forward price curve for emissions permits as reflecting an increasing external cost of emissions as the volume of emissions rises over time. Later emissions do not impose greater costs. Rather, the rising price reflects the market's approach to optimise depletion over time of a finite resource (Hotelling 1931), in this case the resource being the atmosphere's capacity to absorb greenhouse gases without seriously adverse consequences.
- 4 Any new information that increased optimism about new, lower-emissions ways of producing some product, whether they were expected to become available immediately or in the future, would shift downwards the whole structure of carbon prices, spot and forward. Any new information that lowered expectations about the future availability of low-emissions alternative technologies would raise the whole structure of carbon prices, spot and forward.
- 5 The assumed equivalence of a \$40/MWh shortfall penalty and permit prices of \$40–45 per tonne is calculated on an assumed average emissions intensity ratio of 1.0 to 0.9, respectively, for the electricity supplied beyond MRET.

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