BUSINESS ROUNDTABLE ON CLIMATE CHANGE
Meeting 2 – 11 February 2011
Attachment 3A

Agenda Item 3 – Priorities for the Development of a Carbon Price and carbon price architecture

[s22]

Pages 2 to 6 redacted under s 22.

Multi-Party Climate Change Committee's Policy Principles

PRINCIPLES TO GUIDE DEVELOPMENT OF A CARBON PRICE MECHANISM

The Committee acknowledges that Australia needs to reduce its carbon pollution, as part of global efforts to combat climate change. Cuts in global pollution are necessary to reduce the risks posed by unmitigated climate change. For Australia, these risks are large, threatening our economy, our natural heritage (including icons such as the World Heritage listed Great Barrier Reef), and our way of life.

The Committee considers that a carbon pricing mechanism is the most cost-effective and economically responsible way of reducing Australia's carbon pollution, and that its introduction would enable Australia to play its part in global efforts to reduce the risks posed by climate change. A carbon price will also provide opportunities for innovation and investment in lower carbon technologies, and opportunities and rewards for improved land use management.

The Committee has agreed that the following principles should guide the development of any carbon price mechanism. The principles are not stated in any order of priority.

The Committee acknowledges that some principles will be more relevant than others when examining each of the specific design issues and that design decisions may require a trade off.

The Committee notes that each of these principles builds on the fundamental need to develop and foster lasting community consensus and understanding of the need for a carbon price.

The principles are:

1. **Environmental effectiveness:** The mechanism should be capable of delivering reductions in carbon pollution that are informed by the climate science, to ensure that Australia contributes to the global mitigation task and to help transform our economy by driving investment and innovation in clean energy and low emissions technologies and processes.
2. **Economic efficiency:** A mechanism to price carbon should harness the most cost-effective pollution reduction options and facilitate informed and efficient investment decisions. It should also minimise costs of our pollution reduction to the economy as a whole and be consistent with Australia's broader economic reform agenda.
3. **Budget neutrality:** The overall package of a carbon price mechanism and associated assistance measures should be budget-neutral. This does not preclude other measures to address climate change being funded from the Budget, consistent with the Government's fiscal strategy.
4. **Competitiveness of Australian industries:** The overall package of carbon price design and associated assistance measures should take appropriate account of impacts on the competitiveness of all Australian industries, having regard to carbon prices in other countries, while maintaining incentives to reduce pollution.

5. **Energy security:** Introduction of the carbon price should be accompanied by measures that are necessary for maintaining energy security.
6. **Investment certainty:** A mechanism to price carbon should provide businesses with the confidence needed to undertake long-term investments in low emissions technology and infrastructure, which will reduce costs for households and businesses in the long-term. It should keep our industries at the forefront of the research, development and deployment of new clean technologies, attracting global investment flows and creating new jobs.
7. **Fairness:** The introduction of a carbon price will affect Australian households and communities. Assistance should be provided to those households and communities most needing help to adjust to a carbon price, while striving to maintain incentives to change behaviour and reduce pollution.
8. **Flexibility:** Internationally, climate change policy is continuing to evolve. A mechanism to price carbon should be sufficiently flexible to respond to changing international circumstances, including improvements in international accounting rules, developments in climate change science, and tangible international action to deliver an effective global solution.
9. **Administrative simplicity:** A mechanism to price carbon should be designed with a view to minimising both compliance costs and implementation risks.
10. **Clear accountabilities:** A mechanism with transparent scheme rules and clear accountabilities will help promote business and community confidence in carbon pricing.
11. **Supports Australia's international objectives and obligations:** An effective global solution requires action from all major emitters to limit the global temperature rise to less than 2 degrees. A carbon price mechanism should support the goal of promoting international action to deliver an effective global solution, and be consistent with Australia's foreign policy and trade objectives.

[s 22]

DRAFT

Pages 10 and 11 have redacted under s 22

CAP-AND-TRADE - EMISSIONS TRADING
Attachment 3D

Nature of mechanism

Under a cap-and-trade emissions trading scheme, the Government would set an annual **cap** on total emissions of carbon pollution covered by the scheme.

The Government would issue a number of emissions permits equal to the cap. These permits could be sold at auction, or administratively allocated.

Each emissions permit would equal one tonne of carbon dioxide equivalent. At the end of each year, liable entities must surrender a number of permits equal to their actual carbon pollution in that year. Liable entities, and other parties, are free to **trade** permits among themselves.

How the mechanism establishes a carbon price

Carbon prices under a cap-and-trade scheme depend on the degree of international linking. A cap-and-trade scheme can be established with:

- no access to international units;
- no limits on the number of international units that could be used for compliance; or
- quantitative limits on the number of international units that can be used for compliance.

In a scheme with **no access to international units**, a carbon price is established by the **price of domestic units**, which must be surrendered at the end of each year. That price is determined by the balance between the supply of units (set by the government) and the demand for units (created by the liable parties, who need to buy the units to cover their carbon pollution). The carbon price can vary over time. The lower the cap, the more scarce these units would be – and the higher would be the carbon price.

In a scheme that allows for **unlimited trade in international units**, the **domestic carbon price** would be **equal to the international carbon price**, regardless of the level of the Australian cap. The international carbon price would be determined by the international balance between supply and demand for units (the greater the carbon pollution reductions being sought globally, the higher would be the international carbon price.).

In a scheme with **limited access to international units**, the overall carbon price would depend on the differential between the international and domestic carbon price, and the stringency of the quantitative limit on access to international units.

Impact on carbon pollution

The scheme cap provides a **direct constraint on carbon pollution**, and so provides a high level of confidence about emissions outcomes.

If **imports of international units** are allowed, a cap-and-trade scheme still provides **a high level of confidence that Australia's international obligations will be met**. Carbon pollution in excess of the domestic cap would be offset by the purchase of an international unit by a liable party that could legally be counted towards Australia's target. However, the exact level of Australia's domestic carbon pollution cannot be known in advance.

The **price of units creates an incentive to reduce carbon pollution**. Parties will reduce carbon pollution if it is cheaper to do so than purchase units. A carbon price makes lower emissions choices more profitable than they would be without a carbon price. As the carbon price flows through to the prices of goods and services, it also gives consumers signals to choose less emissions-intensive options.

Other key characteristics

Similar to a carbon tax, emissions trading would involve the government identifying which sources of carbon pollution will be included and who would be liable to surrender units for that carbon pollution.

Coverage of different sectors in the economy could be broad or narrow.

Liable parties would need to count their emissions and report them to the regulator.

The carbon price created by the emissions trading scheme would be expected to flow through to higher prices faced by businesses and consumers, raising transitional assistance issues for households and businesses (including emissions-intensive, trade-exposed industries).

The sale of emissions permits provides a source of revenue, which could be used to assist households and businesses, or for any other purpose (e.g. supporting the development of low emissions technology, or offsetting other taxes).

Advantages and disadvantages

The main **advantages** of a cap-and-trade emissions trading scheme are:

- **Certainty about quantity**: emissions trading directly limits carbon pollution by prescribing a scheme cap that is designed to ensure compliance with the relevant international commitment. There is certainty about the level of carbon pollution for the period of time over which scheme caps are set. This is relevant for **supporting Australia's international objectives and obligations, environmental effectiveness and budget neutrality.**
- **Revenue**: if emissions permits are auctioned, this creates a source of Government revenue, which could be used to provide transitional assistance to households and businesses, or for any other purpose (e.g. supporting the development of low emissions technologies, or reducing other taxes). This is relevant for **budget neutrality, fairness, addressing impacts and opportunities on the competitiveness of Australian industries** and potentially for **recognition of impacts and opportunities for energy security** and **environmental effectiveness**.

Minimising fiscal risk: since emissions trading gives a high level of confidence that emissions will match Australia's international commitments, there is minimal risk left to taxpayers that they will need to purchase international units. This could be relevant for **budget neutrality**.

The main **disadvantages** of a cap-and-trade emissions trading scheme are:

- **Carbon price uncertainty**: since the carbon price can vary over time, businesses face carbon price risk. This is no different to risk over wage rates, material inputs, interest or exchange rates. There are ways to manage this carbon price risk, however, via products such as forward contracts or carbon price futures contracts. This is relevant to **investment certainty.**
- **Implementation lead times**: if emissions permits are to be auctioned, lead times are required to develop appropriate auction platforms. This is relevant to **administrative simplicity** and **flexibility**

CARBON TAX
Attachment 3E

Nature of mechanism

Under this option, the production of each tonne of carbon pollution is subject to a tax.

How the mechanism establishes a carbon price

The carbon price is the tax rate set by the Government.

Impact on carbon pollution

A carbon tax directly imposes a cost on producing carbon pollution; this creates an incentive to reduce carbon pollution. Emitters would consider how much they would need to pay in tax to continue to produce greenhouse gases, and compare this with how much it would cost to reduce their carbon pollution. Carbon pollution would be reduced when doing so leaves firms better off than paying the tax.

The level of the carbon tax will influence the quantity of carbon pollution produced. The higher the carbon tax, the greater the incentive to reduce carbon pollution.

The actual level of carbon pollution that would occur at any given tax rate cannot be determined accurately in advance: it can only be roughly estimated.

Other key characteristics

A carbon tax would involve the government identifying which sources of carbon pollution will be included and who would be liable to pay tax on that carbon pollution (eg. a coal mine selling coal, or a power station burning coal, or a retailer selling electricity).

Like a cap-and-trade scheme, sectoral coverage could be broad or narrow.

Liable parties would need to monitor their carbon pollution levels and report them to the regulator.

The carbon price created by the tax would be expected to flow through to higher prices faced by businesses and consumers, raising transitional assistance issues for households and businesses (including trade-exposed, emissions-intensive industries).

A carbon tax is incompatible with allowing international linking. (If the international price fell below the fixed price, the Government would receive no revenue to fund assistance measures.) However, if overall carbon pollution is higher than Australia's national target, carbon tax revenue can be used by the Government to purchase international units to enable Australia to meets its national target.

Advantages and disadvantages

The chief **advantages** of a carbon tax are:

- **(Short term) business certainty**: for a given period, a tax rate is known – liable parties face no uncertainty about what the price of carbon will be. The Government can lock in a carbon price as far into the future as it chooses. (However, over time, the tax rate may be subject to change, particularly if emissions outcomes were not what was expected.) This is relevant to **investment certainty.**

- **Revenue**: a carbon tax creates a source of Government revenue, which could be used to provide transitional assistance to households and businesses, or for any other purpose (e.g. supporting the development of low emissions technologies, or reducing other taxes). This is relevant for **budget neutrality, fairness, addressing impacts and opportunities on the competitiveness of Australian industries** and potentially for **recognition of impacts and opportunities for energy security** and **environmental effectiveness.**
- **Speed of implementation**: no auctions platforms or unit registries are required, which means that a carbon tax could be implemented with relatively short lead times. This is relevant to **administrative simplicity**.

The chief **disadvantages** of a carbon tax are that:

- **Carbon pollution outcomes are uncertain**: a carbon tax does not guarantee that any particular emissions outcome will be reached. This is relevant to **supporting Australia's international objectives and obligations, environmental effectiveness** and **budget neutrality.**
- **Long-term price risk for business**: a carbon tax might require periodic adjustments to ensure Australia's carbon pollution was on track to meeting our target. These are relevant for **investment certainty**.
- **Fiscal risk**: if a carbon tax rate is set too low to encourage the reductions in carbon pollution required to meet Australia's international targets, the Government would need to purchase international units to make up for the shortfall. If the tax rate were lower than the price of international units, then there would be a net cost to taxpayers for each tonne of carbon pollution in excess of the target. If a carbon tax rate were set too high, it would divert resources into reducing carbon pollution beyond the level required to meet Australia's international targets, raising excess revenue and imposing an unnecessary cost on the economy. This is relevant to **budget neutrality**.

EMISSIONS TRADING WITH FIXED PRICE START MODEL
Attachment 3F

Nature of mechanism

The emissions trading with fixed price start model is a variant of a cap-and-trade emissions trading scheme. Professor Garnaut recommended such a transitional approach in his 2008 Climate Change Review, to deal with a situation in which Australia's target had not been internationally agreed.

A transitional scheme would start with a fixed price for emissions permits applying for a specified period. Following a review, which could be triggered by a range of factors such as an international agreement on climate change, the restriction on emissions permit prices would be relaxed, and the scheme would transition to a standard cap-and-trade model.

How the mechanism establishes a carbon price

A carbon price is established by the **price of the permits** that must be surrendered at the end of each year. In his 2008 Review, Professor Garnaut suggested that price be initially set at $20 per tonne in 2010 (in 2005 prices), rising each year by 4 per cent plus the percentage increase of the consumer price index.

Following a transitional period, restrictions on the price of permits would removed. The carbon price would then be determined by the balance between the supply of permits (set by the government) and the demand for permits (created by the liable parties, which need to buy the permits to cover their carbon pollution).

The carbon price can vary over time depending on the scarcity of permits. Under the Garnaut model, domestic offsets (from uncovered sectors) and international units would be allowed. These would increase unit supply and lower carbon prices in Australia (subject to unit export arrangements). In a scheme that allows for **unlimited trade in international units**, the **domestic carbon price** would be **equal to the international carbon price**, regardless of the level of the Australian cap. The international carbon price would be determined by the international balance between supply and demand for units. (The greater the carbon pollution reductions being sought globally, the higher would be the international carbon price.)

Impact on carbon pollution

During the **fixed price period**, the impact on carbon pollution would depend on the response to the carbon price. The higher the carbon price, the lower levels of domestic carbon pollution are likely to be. If carbon pollution levels exceeded our national targets, then the Government could purchase international units to enable Australia to meets its national target.

During the subsequent flexible price phase, the scheme cap provides a **direct constraint on carbon pollution**, and so provides a high degree of confidence about emissions outcomes.

If **imports of international units** are allowed, a cap-and-trade scheme still provides **certainty that Australia's international obligations will be met**. Carbon pollution in excess of the domestic cap would be offset by the purchase by a liable party of an international unit that could legally be counted towards Australia's target. However, the exact level of Australia's actual carbon pollution cannot be known in advance.

The **price of permits creates an incentive to reduce carbon pollution**. Parties will reduce carbon pollution if it is cheaper to do so than purchase permits. A carbon price makes lower emissions choices more profitable than they would be without a carbon price. As the carbon price flows through to the prices of goods and services, it also gives consumers signals to choose less emissions-intensive options.

Other key characteristics

Similar to other mechanisms, the emissions trading with fixed price start model would involve the government identifying which emissions will be included and who would be liable to surrender permits for those emissions. In principle, the scheme could have broad or narrow sectoral coverage. (The Garnaut Review proposed broad sectoral coverage.) Liable parties would need to count their emissions and report them to the regulator.

The carbon price would flow through to prices of goods and services. This raises issues around assistance for affected households and businesses, including emissions-intensive, trade-exposed industries.

Once trading commences there are instruments that could be used to manage price volatility, particularly in the early years of the scheme.

The sale of emissions permits provides a source of revenue, which could be used to assist households and businesses, or for any other purpose (e.g. supporting the development of low emissions technology, or offsetting other taxes).

A fixed price period is incompatible with allowing international linking. (If the international price fell below the fixed price, the Government would receive no revenue to fund assistance measures.) However, if the overall level of carbon pollution is higher than Australia's national target, emission permit sales revenue can be used by the Government to purchase international units to enable Australia to meet its national target. The flexible price period is compatible with international linking.

Advantages and disadvantages

The advantages and disadvantages of the emissions trading with fixed price start model differ depending on the timing of consideration (i.e. whether the mechanism is operating in its transitional fixed price period, or the period without price constraints).

The chief **advantages** of the emissions trading with fixed price start model are:

- **Business certainty (during the transitional period):** for a given period, the carbon price (and the rate at which it increases) is known – liable parties face no uncertainty about what the price of carbon will be. This is relevant to **investment certainty**.
- **Certainty about quantity (after the transitional period):** emissions trading directly limits carbon pollution by prescribing a scheme cap that is designed to ensure compliance with the relevant international commitment. This is relevant for **environmental effectiveness.**
- **Revenue (during both periods):** both the fixed and variable price periods can generate revenue (assuming some units are auctioned in the variable price phase) which could be used to provide assistance to households and businesses, or for any other purpose (e.g. supporting the development of low carbon pollution technologies, or reducing other taxes). This is relevant for **budget neutrality, fairness, addressing**

impacts and opportunities on the competitiveness of Australian industries and potentially for **energy security** and **environmental effectiveness.**

- **Speed of implementation (fixed price period):** no auctions platforms or unit registries are required in the fixed price period, which means that a fixed-price mechanism could be implemented with relatively short lead times (although these arrangements would be required after the fixed-price period). This is relevant to **administrative simplicity**.
- **Minimising fiscal risk (after the transitional period):** since emissions trading without price constraints gives a high level of confidence that carbon pollution level will match Australia's international commitments, there is minimal risk over the longer term to taxpayers that they will need to purchase international units to meet Australia's targets. This could be relevant for **budget neutrality**.

The chief **disadvantages** of the emissions trading with fixed price start model are that:

- **Carbon pollution outcomes are uncertain (during the transitional period):** a fixed-price period does not guarantee that any particular carbon pollution outcome will be reached. This is relevant to supporting Australia's international objectives and obligations, **environmental effectiveness** and **budget neutrality.**
- **Long-term price risk for business (after the transitional period):** since the carbon price can vary over time, businesses face carbon price risk. (There are ways to manage this risk, however, via products such as forward contracts or carbon price futures contracts.) This is relevant to **investment certainty.**
- **Fiscal risk (during the transitional period):** if the fixed price were set too low to encourage the carbon pollution reductions required to meet Australia's targets, the Government could purchase international units to make up for the shortfall. If the fixed price was lower than the price of international units, then there would be a net cost to taxpayers for each tonne of carbon pollution in excess of the target. This is relevant to **budget neutrality.**
- **Transition to a flexible carbon price:** moving from a fixed to a flexible price could potentially involve a significant increase or decrease in carbon prices. (If sufficient lead-times are given, businesses will have access to ways to minimise this risk.) This is relevant to **investment certainty**

BASELINE-AND-CREDIT SCHEME
Attachment 3G

Nature of mechanism

Baseline-and-credit emissions trading systems are those in which firms are rewarded for reducing carbon pollution below a baseline. These reductions become 'credits' which can be traded. Liable parties under the scheme must purchase these credits, and then surrender them to the regulator at the end of each year to meet their share of an economy-wide or sector-wide target. Each 'credit' represents one tonne of carbon dioxide equivalent abated.

Baselines are generally intensity-based (that is, carbon pollution per unit of production).

How the mechanism establishes a carbon price

A carbon price would be established by the trade in credits. The price of credits would be variable, depending on the balance between supply of credits (from those implementing projects that bring carbon pollution below the baseline) and demand for credits (from those who have to meet the target).

Firms participating in a baseline-and-credit mechanism can generate income, by generating credits and selling them.

Impact on carbon pollution

Rewarding firms that reduce carbon pollution below a baseline creates an incentive to reduce carbon pollution.

Total carbon pollution is generally not capped through a baseline and credit approach. While the number of credits that must be surrendered in each year can be set in advance, the government does not know how much carbon pollution will still be created. Also, since baselines are usually related to intensity (tCO_2-e per unit of production), increases in total production can outweigh the carbon pollution reductions associated with producing each unit. Finally, it can be difficult to tell whether carbon pollution reductions credited under the scheme are 'real' (that is, additional to what would have otherwise occurred).

Other key characteristics

Other key requirements of a baseline and credit scheme include:

- liable parties need to be identified, and methods to determine how many credits they need to buy each year devised. This must be monitored and enforced; and
- scheme rules setting out what activities will be credited, and how, need to be established and updated over time. These scheme rules need to try to ensure that only 'real' (additional) abatement is credited.
- In principle, a baseline-and-credit approach could be applied to a broad or narrow set of sectors. In practice, it is difficult to set baselines for sectors that do not have homogeneous outputs (it is difficult to specify the baseline in terms of carbon pollution per unit of output if outputs are hard to define).

A baseline and credit scheme can be combined with access to international units.

Participants seeking credit for carbon pollution reduction activities need to be accredited by a regulator, and show that they have undertaken abatement calculated in accordance with the rules. Generally following an audit, credits would be awarded.

Advantages and disadvantages

Possible **advantages** of baseline and credit mechanisms include:

- **Easily understood incentives to reduce carbon pollution**: reductions in carbon pollution are directly credited through the measure. (However, if methodologies for crediting abatement are overly complex, this advantage might not apply.)
- **Possible downward pressure on some output prices**: instead of avoiding a cost (from either a tax or having to purchase a unit under cap-and-trade), firms participating in a baseline-and-credit mechanism can generate income, by generating credits and selling them. (This cost is transferred to those who are required to buy the credits, and costs may also be borne by those competing with credit creators.)

Possible **disadvantages** include:

- **Uncertainty over final carbon pollution levels**: a target under a baseline-and-credit scheme is normally defined as the number of tonnes of abatement that must be secured in each year. This is not the same as knowing what the final carbon pollution emissions outcomes might be, which could vary significantly. This is relevant for **environmental effectiveness, supporting Australia's international objectives and obligations**, and **budget neutrality.**
- **Difficulty in defining 'real' abatement**: because abatement is credited against a hypothetical estimate of what the level of carbon pollution would otherwise have been, it is difficult to be sure that abatement credited represents a real reduction in carbon pollution. This is a common criticism of baseline-and-credit schemes.[1] The assessment of whether abatement is 'real' can be highly detailed and rigorous (increasing compliance costs), or simple, standardised approaches can be used (which are cheaper to implement, but increase the chances of crediting activity that was going to happen anyway). This is relevant for **environmental effectiveness.**
- **Administrative complexity**: all abatement must be defined in scheme rules before it can be rewarded. There is no automatic incentive to reduce carbon pollution: businesses only benefit from reducing carbon pollution if they have gone through administrative processes of accreditation, comply with scheme rules, and probably audited. This is relevant to **administrative simplicity.**
- **Need to regularly update baselines**: baselines can become out of date, which increase the chances of crediting abatement that is not 'real.' To avoid this, baselines can be updated at regular intervals, increasing administrative costs and potentially reducing business certainty. This is relevant to **administrative simplicity** and **investment certainty.**

[1] See for example, Passey R, et al, *The governance challenge for implementing market-based climate policies: a case study of the New South Wales Greenhouse...* Energy Policy (2008), doi:10.1016/j.enpol.2008.04.010

- **No source of revenue to provide transitional assistance**: a baseline and credit scheme raises no revenue. If assistance is to be provided to households or businesses, this would come at a net cost to the Budget. This is relevant for **budget neutrality, fairness, addressing impacts and opportunities on the competitiveness of Australian industries** and potentially for **recognition of impacts and opportunities for energy security and environmental effectiveness.**

THE MCKIBBIN-WILCOXEN MODEL – A HYBRID SCHEME

Attachment 3H

A hybrid mechanism combines a carbon tax with emissions trading. This paper discusses a particular hybrid model, proposed by Professor Warwick McKibbin and Associate Professor Peter Wilcoxen.

Nature of mechanism

The McKibbin-Wilcoxen model suggests replacing the current system of international binding medium-term targets and cap-and-trade mechanisms with a system that combines jurisdictional carbon taxes with domestic emissions trading linked to long-term targets.

The government would issue long-term units that would be related to the government's long-term carbon pollution reduction target. These permits would be valid for a long period of time (e.g. for 10 years or longer, potentially even in perpetuity) and would allow the holder to emit a nominated amount of CO_2-e every year for the period of validity. (The nominated amount would decrease over time.) These units would be tradable, and have the status of firm property rights.

At the same time, a short-term carbon price would be established by issuing an unlimited number of emission units at a fixed price. These short-term units would be valid only in the year of issue, and could not be traded. The price of these short-term units operates as a carbon tax which is set at a level determined by the Government.

At the end of each year, liable parties could comply by using either short-term or long-term units, or a combination of both.

How the mechanism establishes a carbon price

The model establishes a short-term and a long-term price for carbon. The short-term price is set directly by the government (in the same way as a carbon tax); the long term price is set indirectly by the market, through trade in the long-term units. The price of long-term units would reflect the scarcity of those units and expectations of likely future short-term prices to be set by the government.

Impact on carbon pollution

Similar to a carbon tax, the short-term impact on carbon pollution would depend on the response to the carbon price. Total carbon pollution levels would exceed the cap implied by the issue of long-term units, by the extent of the use of short-term units. Over the longer term, the impact on carbon pollution is mostly driven by the expectations of high future carbon prices.

Other key characteristics

Like a cap-and-trade emissions trading scheme or a carbon tax, the McKibbin-Wilcoxen model requires the government to specify which sources of carbon pollution would be covered and who would be liable for that carbon pollution. Sectoral coverage could be broad or narrow.

Monitoring and reporting systems would also be established.

Since the carbon price would be expected to be passed on in the form of higher prices, the same consideration of the need for household and industry assistance would be required.

The model does not propose any international trade in units (either short or long term).

Advantages and disadvantages

The model's proponents fundamentally disagree with the current international system of agreeing to 'targets and timetables.' The model is proposed not just as a domestic arrangement, but an alternative global system.

The main potential advantages of the McKibbin Wilcoxen model, applied domestically, are:

- **Price predictability**: short-term price volatility is capped by the price of short-term units, while the longer-term carbon price is indicated by the trading prices of long-term units. (Given the short-term price would be reviewed and changed at regular intervals, there is potential uncertainty about its future levels.) Given there is no international trading, there is no chance of other governments' decisions having an unanticipated impact on the carbon price. This is relevant to **investment certainty.**
- **Long-term business certainty over business assistance arrangements**: the up-front allocation of long-term units can provide a form of industry assistance. This assistance is of a secure and long-term nature, providing considerable certainty for recipients. (Special arrangements might be required for new entrants, or in the event of closure of a recipient company.) This is relevant to **investment certainty** and **addressing the impacts** and **opportunities on the competitiveness of Australian industries.**

The potential disadvantages of this approach are:

- **Fiscal risks**: although the McKibbin-Wilcoxen model is proposed as an alternative arrangement, Australia's Kyoto target is specified in terms of a hard carbon pollution target over a particular timeframe, and it is highly likely that future targets will be specified in the same way. Since total carbon pollution is not capped in this system, taxpayers face the risk of paying for international units to bring Australia into compliance if targets are not met. This is relevant to **supporting Australia's international objectives and obligations** and **budget neutrality.**
- **Lack of flexibility in assistance arrangements**: giving away long-term permits involves making decisions about assistance for long periods of time, which reduces flexibility in the face of future changes. (The extent to which this is a problem depends on the tenure of the long-term permits and how they are allocated.) This is relevant for **flexibility, fairness** and **addressing impacts and opportunities for the competitiveness of Australian industries.**
- **Lack of flexibility in long-term targets**: unless the allocation of long-term units was conservative, long-term targets would be locked in up front, and could only be reduced (say, in response to a revised assessment of the risks associated with climate change) by buying back some long-term units. This is relevant to **supporting Australia's international objectives and obligations, environmental effectiveness** and **budget neutrality.**

ELECTRICITY SECTOR EMISSIONS INTENSITY-BASED SCHEME
Attachment 3I

Nature of mechanism

An emissions-intensity scheme applying to the electricity sector is a variant of a baseline-and-credit scheme. Under an electricity sector intensity-based scheme, a target rate of carbon pollution per unit of output (for example, tonnes of carbon dioxide equivalent per megawatt hour of electricity produced (tCO_2-e/MWh) would be set for the industry.

The Government would forecast the quantity of electricity to be supplied over the period to which the intensity target would apply (total MWh). The Government would also set an emissions intensity baseline for the industry (tCO_2-e/MWh). The baseline would decline annually to reflect the Government's targets for total carbon pollution.

Electricity generators would receive an allocation of permits at the baseline level for every unit of output that they produced. For example, if the baseline level of intensity were 0.7 tCO_2-e /MWh, each generator (no matter what its emissions intensity) would receive 0.7 of a permit for each MWh produced.

At the end of each year, generators would need to surrender one permit for each tonne of carbon pollution actually produced. For generators whose emissions intensity were above the baseline (say, coal-fired generators), this means they would have to purchase extra permits - they would not have been issued enough for free. Conversely, generators with an emissions intensity below the baseline (say hydro or wind) would not need any or all of the permits allocated to them, and could sell their excess permits to generators above the baseline.

In effect, this approach provides a subsidy to generators below the baseline, and imposes a cost on those above the baseline.

The net effect on the profitability of generators should be identical to that of a cap-and-trade scheme. However, the impact on electricity prices is likely to be lower than the impact of a cap-and-trade scheme.

How the mechanism establishes a carbon price

A carbon price would be established by the trade in permits between liable entities, with the price level depending on the difference between the demand for permits from above-baseline parties and the supply from below-baseline parties.

If the electricity sector emissions-intensity scheme were embedded in a broader emissions trading scheme, the price would be determined by the overall balance between demand and supply for permits.

Impact on carbon pollution

An intensity-based approach does not limit absolute carbon pollution. Achieving the intensity target does not guarantee any particular emissions outcome, which would depend on final electricity output levels. (If electricity output is higher than anticipated, total carbon pollution will also be higher than anticipated. Conversely, if electricity output is lower than anticipated, total carbon pollution will also be lower.)

If an intensity-based scheme were embedded in a broader cap-and-trade scheme, it would be difficult to cap total carbon pollution in any year because the Government would not know how many permits it needed to issue the electricity sector until the end of the year.

Other key characteristics

This mechanism requires:

- baselines to be established in advance, and possibly updated over time; and
- monitoring, reporting and compliance arrangements (as for other carbon pricing mechanisms).

Access to international units could be included in an intensity-based scheme.

Advantages and disadvantages

The main potential **advantages** to an intensity-based approach to reducing carbon pollution from the electricity generation sector are:

- **Lower impacts on household electricity prices**: generators/liable parties would only be required to purchase permits for their carbon pollution above the baseline, rather than for all of their carbon pollution emissions as would be the case under a carbon tax, cap-and-trade scheme, hybrid or consumption based model. This is relevant to **fairness** and **addressing the impacts** and **opportunities on the competitiveness of Australian industries.**
- **Lower assistance requirements for electricity users**: lower electricity price increases would reduce (not eliminate) the need to provide assistance to households and business, including emissions-intensive, trade-exposed industries, compared with an equivalent cap-and-trade scheme. This is relevant to **fairness and addressing the impacts** and **opportunities on the competitiveness of Australian industries**.

The main potential **disadvantages** of this model are:

- **Uncertain abatement**: An intensity-based measure does not limit the actual quantum of carbon pollution, making it a less suitable mechanism to employ to reach a specific absolute carbon pollution target. This is relevant to **supporting Australia's international objectives** and **obligations** and **budget neutrality.**
- **Difficulty expanding to other sectors**: this model shares the administrative complexity of a baseline-and-credit scheme if it is contemplated for expansion to sectors beyond electricity generation. This approach is only suited to industries that produce a homogeneous output (with preferably only one type of output per facility), so that baselines can be created on a per unit of output basis. However, the approach for electricity could be embedded within a broader cap-and-trade emissions trading scheme. This is relevant to **administrative simplicity.**

- **Difficulty in managing an overall cap on carbon pollution**: if the intensity-based model for electricity is implemented within a broader cap-and-trade scheme, the Government will not know how many permits it can issue under the cap until the end of each year, when it knows how many permits have already been issued to electricity generators. In practice, adjustments in subsequent years would need to make up for any inadvertent under- or over-allocation of permits compared with the cap. This makes planning for assistance mechanisms and auction implementation and participation more difficult and potentially shifts adjustment burdens to elsewhere in the economy (in a scheme without full international linking). This is relevant for **budget neutrality, environmental effectiveness, addressing impacts** and **opportunities on the competitiveness of Australian industries** and **investment certainty.**
- **Lack of demand-side response**: the lower potential impact on electricity prices reduces incentives for implementation of energy efficiency measures or fuel-switching to less emissions-intensive energy sources at the consumer end. Modelling carried out for earlier carbon pricing proposals identified demand-side response as a significant driver of electricity sector abatement to 2020. As this is low-cost abatement, further more expensive abatement is required on the supply side in order to achieve compliance. This is relevant to **economic efficiency** and **environmental effectiveness**.
- **Lack of revenue for assistance**: if implemented on a stand-alone basis, unlike a carbon tax or a cap-and-trade mechanism, this model would deliver no revenue for assistance. (The need for assistance for households and other electricity users would be reduced, but not eliminated. Any need for assistance for generators would be the same as in a cap-and-trade scheme or a carbon tax, as the loss of asset value for high emission generators remains.) Regardless, no revenue is received in relation to those emissions permits provided for free to each unit of generation, according to the baseline level of intensity. This is relevant for **budget neutrality, fairness, addressing impacts** and **opportunities on the competitiveness of Australian industries an**d potentially for **recognition of impacts** and **opportunities for energy security** and **environmental effectiveness**.
- **Fiscal risks**: The combination of uncertain abatement and difficulties in managing an overall cap on carbon pollution creates fiscal risks. This is relevant for **budget neutrality**.

CONSUMPTION-BASED MODEL ('CARMODY MODEL')
Attachment 3J

Nature of mechanism

This mechanism is a form of carbon tax. The key distinguishing feature is that it seeks to target only carbon pollution embodied in goods and services consumed in Australia. No liability would be imposed on carbon pollution embodied in goods or services exported from Australia. A carbon tax would be applied to all imported goods and services (a 'border tax adjustment').

A consumption-based model is different to the way in which national carbon pollution and targets are measured and defined under current UN processes: all carbon pollution produced in Australia is currently counted towards Australia's inventory. No deduction is made for goods and services that are exported; no amount is added for goods and services that Australia imports.

The consumption-based model could be applied in a single country. It could also be applied globally, as a replacement for the current system of production-based targets.

How the mechanism establishes a carbon price

The carbon price is the tax rate set by the Government.

Impact on carbon pollution

For those subject to the tax, the incentive to reduce carbon pollution is the same as a standard carbon tax. The total level of resulting carbon pollution would be uncertain and would depend on how businesses responded to the tax.

No incentive to reduce carbon pollution would be created for exporting industries. An incentive for exporters to reduce carbon pollution could be created if the importing country decided to impose its own border tax adjustment (no countries do at present).

An incentive would be created for countries that export goods to Australia to reduce carbon pollution if this led to a reduction in the tax levied in Australia

Other key characteristics

Most characteristics of the Carmody model are the same as for a standard carbon tax.

Additional characteristics are:

- the need to identify carbon pollution embodied in exported products, in order to exempt them; and
- potentially, the need to set and apply a border tax adjustment. Carmody has proposed setting this on the basis of the average emissions intensity of the competing Australian production.

These characteristics together imply an administratively complex system of tracking and assessing carbon pollution through domestic production processes.

This approach also treats all imports as having the same embodied carbon pollution as the equivalent Australian production, regardless of whether those imports are more- or less emissions-intensive than Australian production.

Two alternative approaches are also possible:

- to use the average emissions intensity of an imported product (from the range of import sources) as the basis of carbon charging. However, this would provide no incentive to secure imports from a less emissions-intensive source.
- to use the actual emissions intensity of imports, provided that an equivalent methodology was applied to all goods. However, determining the emission intensity of production in other countries would be a very difficult exercise.

Advantages and disadvantages

The key advantages and disadvantages of a standard carbon tax would also apply to the Carmody model.

Additional possible **advantages** include:

- **Removing the risk of carbon leakage for export industries**: since exporting industries would be exempt, there would be no risk of them moving offshore because of the impact of a carbon price. Import-competing industries would be protected from competition from countries that do not impose their own carbon price by the border tax adjustment. This is relevant to **addressing impacts** and **opportunities on the competitiveness of Australian industries.**
- **Clearer price signals for Australian consumers**: all goods and services consumed in Australia – including imports – would be subject to a carbon price. Therefore, consumers would have an incentive to make lower emissions choices across the full spectrum of goods and services that they purchase. This is relevant to **economic efficiency** and **environmental effectiveness.** (As discussed above, however, the relevance of the carbon price to the actual carbon pollution embodied in imported goods depends on how it is applied.)
- **Distributional consequences**: consumption-based mechanisms have been proposed by some as a fairer solution to the distribution of international efforts to reduce carbon pollution (with the implication that this would make it quicker and easier to reach a global agreement). It is estimated that up to one-third of the carbon pollution associated with consumption in developed countries are produced outside those countries' borders. This is relevant to **supporting Australia's international objectives** and **obligations.**

The potential **disadvantages** of this model include:

- **Complexity**: exempting carbon pollution associated with exports requires tracking carbon pollution through the production chain. This is particularly complex for inputs such as electricity, where carbon pollution from an individual generator is not tied directly to an individual exporter, and for products such as cars that involve a very wide range of manufactured inputs with different levels of embodied carbon pollution. (Rules of thumb could be applied, however.) Levying a border tax adjustment on imports would also require reliable information about the emissions intensity of production processes (including for inputs, such as electricity) in Australia, and potentially in other countries in cases where there is no competing Australian production of the imported goods. These processes are inherently complex. This is relevant for **administrative simplicity**.

- **Fiscal risk (production-based targets and consumption-based policy)**: as a Party to the Kyoto Protocol and a signatory to the United Nations Framework Convention on Climate Change, Australia is subject to obligations defined on a production, not consumption, basis. There is a risk that a consumption-based carbon tax (or emissions trading scheme) would lead to carbon pollution significantly in excess of Australia's international targets. Any such excess carbon pollution could be covered by the purchase of international emission units by the Australian Government. This is relevant to **supporting Australia's international objectives** and **obligations** and **budget neutrality.**
- **No incentives created for exporting industries to reduce carbon pollution**: since carbon pollution embodied in exports would be exempt, there would be no incentive for exporters to reduce their carbon pollution (in the absence of border tax adjustments applied by other countries). Global carbon pollution could therefore be higher than if such an incentive had been created. While Australia is liable for carbon pollution under its target, an increased fiscal risk is passed to taxpayers. This is relevant to **environmental effectiveness, economic efficiency** and **budget neutrality.**

COMPARISON OF DIFFERENT DESIGN OPTIONS FOR A CARBON PRICE

	DESIGN OPTIONS AND EXAMPLES	DESCRIPTION	BENEFITS	CHALLENGES
CARBON PRICE MODELS	**CONSUMPTION BASED TAX** - Carmody model.	Same broad concept as a carbon tax, however the price is charged on greenhouse gases embodied in products consumed within a country, regardless of whether those products are imported or locally produced.	• Shares most benefits noted for carbon tax. • Addresses 'carbon leakage' issues by treating locally produced and imported products in the same way, and exempting exports.	Shares most challenges noted for carbon tax, *plus* • Complexity introduced by the need to impose border tax adjustments and exempt carbon pollution embodied in exports. • Would be inconsistent with current global approach to assigning responsibility for carbon pollution, which is based on the carbon pollution produced within the boundary of a country. • No incentives are provided to exporters to reduce carbon pollution (unless foreign countries apply border tax adjustments), even though Australia is still responsible for that carbon pollution under its target. • There is a loss of economic efficiency as estimates of carbon pollution embodied in products are unlikely be accurate or comprehensive, particularly for imported products.
	BASELINE AND CREDIT - NSW and ACT Greenhouse Gas Reduction Scheme.	'Baseline and credit' is a broad term that can cover different design approaches. The Government sets a carbon pollution emissions baseline (eg intensity baseline) for emitting activities. Credits are created for activities that achieve emissions (or emissions intensities) below the baseline. Liable parties must purchase credits, according to their share of the carbon pollution reduction target. Credits may be traded (subject to any scheme limitations).	• Provides positive incentives for participants to find lower emission production processes. • Depending on design (if limited to certain sectors) can entail lower levels of required assistance for industry and households.	• Difficult to control total carbon pollution. • Fiscal risks associated with under-achievement of targets - if baselines are set too low the Government may need to purchase emissions units on the international market. • There may be reduced certainty for investors if the policy is to adjust the baseline to meet targets in favour of the Government purchasing international emission units. • Baselines setting can introduce complexity, transaction costs and arbitrariness. • No revenue for assistance as all transactions take place privately. • It is difficult to tell whether abatement is 'real', or whether it would have happened anyway.
	'Intensity-based' scheme - Intensity based electricity-sector component of the model proposed by Frontier Economics.	A type of a baseline-and-credit scheme where the baseline is set on an emissions intensity basis (carbon pollution per unit of output). The baseline would decline annually to reflect the Government's targets for improved emissions intensity.	• Electricity prices are likely to be lower than under a cap-and-trade scheme or carbon tax.	• Uncertain abatement outcomes. • Fiscal risks associated with under achievement of targets - attaining an absolute target would require the accurate forecasting of output. If the intensity baseline is set too low the Government may need to purchase emissions units on the international market. • There may be reduced certainty for investors if the policy is to adjust the intensity baseline to meet targets in favour of the Government purchasing international emission units. • If implemented on a stand-alone basis there will be no revenue for assistance. • While the need for assistance for households and other electricity users would be reduced, it would not be eliminated. Any need for assistance for generators would be the same as in a cap-and-trade scheme or a carbon tax. • Difficult to expand to other sectors. • Few incentives for consumers of emissions-intensive products and services to change behaviour.
	HYBRID MODEL - McKibbin-Wilcoxen model.	The Government would issue long-term units, the total sum of which would be linked to the long-term carbon pollution reduction target and would decrease over time - these units would be tradable within the country of issue, but not between countries. The Government would also sell short-term units at a fixed price –these units could not be traded.Each liable entity covered by the mechanism would be required to hold a 'portfolio' of short-term and long-term units equivalent to their carbon pollution in any particular year.	• Would achieve short term certainty over carbon price as well as long term certainty as to the quantity of allowable carbon pollution. • Long-term certainty via allocation of long-term emissions units.	• Does not limit carbon pollution in the near term. To the extent that domestic carbon pollution exceeded the target, the Government may need to purchase international units to make up the shortfall. • Would potentially require governments to 'lock in' very long term targets, which would be difficult to agree and reduces flexibility. • Lack of flexibility in assistance arrangements if long term units are issued up front.

COVERAGE
Attachment 3L

[s 22]

Pages 33 to 37 have been redacted under s 22.

Should Australia implement a baseline-and-credit scheme, other countries with cap-and-trade emissions trading schemes may be less likely to accept Australian permits in a cap-and-trade scheme, primarily due to the absence of an absolute cap on carbon pollution, unless those permits were backed by transfer of a Kyoto unit.

McKibbin-Wilcoxen hybrid model

The McKibbin-Wilcoxen model is not intended to link internationally. However, it could be linked unilaterally by enabling imports of overseas units to be surrendered in Australia.

The unlimited supply of annual permits limits the prospects for exports of units from such a scheme, due to the absence of an absolute cap on carbon pollution.

Carbon tax

Allowing imports under a carbon tax raises very large fiscal risks. If the international carbon price falls below the tax rate, no revenue would be raised to fund assistance or other measures, as all participants would prefer to purchase an international unit instead.

Carbon taxes could in theory be harmonised across countries creating a global carbon price, but this would involve a new multi-party international agreement.