

9 Auctioning of Australian carbon pollution permits

Once created, carbon pollution permits within the Scheme cap need to be allocated or released to the market either by administratively allocating them or by auctioning them. Auctioning is an efficient method of allocating permits. The Government has decided that a large proportion of permits will be auctioned, highlighting the importance of auction design.

This chapter analyses the relevant experience in government auctions and sets out the key features of the Carbon Pollution Reduction Scheme auction:

- Section 9.1 describes international and domestic examples of environmental resource auctions.
- Section 9.2 sets out the objectives of the auction.
- Section 9.3 discusses the advantages of auctioning as an allocation method.
- Section 9.4 identifies auction governance arrangements.
- Section 9.5 specifies the auction design features.

9.1 International and Australian experience

Although auctions of emissions permits have been relatively rare internationally (see Box 9.1), there is a wealth of relevant Australian and international experience in auctioning scarce public resources.¹ Together, those experiences provide useful insights into auction policy design.

Experience gained from government auctions of scarce resources in Australia and overseas, although not all related specifically to the auction of environmental resources, can be applied to the auction of carbon permits, particularly to the mechanics of the auction process.

Box 9.1: International experience with environmental market auctions

Examples of auctions in environmental markets include the auction of:

- sulphur dioxide permits, conducted since 1983 as part of the United States Acid Rain Program
- nitrogen oxide allowances, held in Virginia in 2004 and 2005
- emissions permits, held in 2002 under the United Kingdom Emissions Trading Scheme
- emissions permits in Ireland, Hungary, Denmark and Lithuania, held from 2005 to 2007 as part of the first phase of the European Union Emissions Trading Scheme
- emissions permits in North America as part of the Regional Greenhouse Gas Initiative, which held its first auction in September 2008.²

Although auctions are increasingly being used in recently proposed schemes and subsequent phases of existing schemes, there is little experience of auctions in which a large percentage of the total number of permits in a scheme are allocated.

Source: Evans & Peck, *Further definition of the auction proposals in the NETT discussions paper*, report to the National Emissions Trading Taskforce, 2007, available at <http://www.emissionstrading.net.au>.

9.2 Objectives of the auction

The design of the auction will be influenced by the objectives it is seeking to achieve. The Government considers that the key objectives are as follows:

- *Promote allocative efficiency.* A well-designed auction should allocate permits in a way that will best facilitate an efficient carbon market by channelling permits to their highest value in the economy with a minimum of risk and transaction costs.
- *Promote efficient price discovery.* Making the auction results public will provide an important price signal early in the Scheme. That signal should stimulate behavioural change, for example by helping liable entities to manage their emissions obligations and make informed investment decisions. Later, as the secondary market matures, that market will become the main source of information about carbon prices and the influence of the auction will diminish.
- *Raise auction revenue (consistent with other objectives).* The auction should also raise revenue that can be used for other policy objectives, such as providing assistance to households and businesses. However, the auction has not been designed with the primary aim of maximising revenue.

There is usually no conflict between the objectives of promoting allocative efficiency and price discovery, and raising auction revenue. If conflict arises, the Government will give priority to the first two objectives.

9.3 Advantages of auctioning as an allocation method

The Government has decided that a large proportion of carbon pollution permits will be auctioned from the start of the Scheme. This is consistent with the preferred position stated in the Green Paper.

Green Paper position

Allocations would, over the longer term, progressively move towards 100 per cent auctioning as the scheme matures, subject to the provision of transitional assistance for emissions-intensive trade-exposed industries and strongly affected industries.

The Government considers that auctioning permits has a number of advantages over allocating them directly to liable entities, although direct allocations can be used to achieve other policy objectives.

In theory, there should be no difference in efficiency between auctioning permits and allocating them administratively, because permits could be allocated to their highest value use under either system. As long as the permits are fully tradeable and the particular use of the permits does not change current and future permit allocations, firms could trade permits to their highest value use, even if the initial allocation is inefficient.

In practice, because administrative allocations will be made for reasons other than pure efficiency, the initial allocation of permits will not be made to the highest valuing users. Firms will be able to trade permits in the secondary market, but trading costs and information issues mean that this will not be costless. Furthermore, international experience suggests that where permits are issued for free there may initially be some inefficient hoarding by the recipients.

Box 9.2: International and other Australian scheme proposals for auctions

Several emissions trading models have advocated the use of auctions to distribute permits, including:

- the Task Group on Emissions Trading³
- the National Emissions Trading Taskforce⁴
- The Garnaut Climate Change Review: Final report⁵
- New Zealand's emissions trading scheme⁶
- Phase III of the European Union Emissions Trading Scheme⁷
- the Regional Greenhouse Gas Initiative in the United States.⁸

For these reasons, some stakeholders, such as the Australian Financial Markets Association, were in favour of auctioning 100 per cent of permits:

AFMA supports, over the longer term, moving to 100 per cent auctioning. (Submission 550, p. 15)

The Garnaut Final Report also expressed support for the Government's position:

Australia, with its well-established legal, regulatory and administrative structure, is in a favourable position for full auctioning of permits. (Garnaut Final Report, p. 331)

Some stakeholders asserted that auctioning might not result in an equitable allocation. For example, Visy Industries Australia argued against business being required to pay for permits.

The Green Paper's proposal that 100 per cent of permits for emissions are auctioned is not workable, and will place undue burdens on the Australian economy. (Submission 437, p. 12)

However, a small number of stakeholders were opposed to the distribution of permits by administrative allocation. These included the Construction, Forestry, Mining and Energy Union:

The free allocation of permits tends to encourage gaming behaviour by business, leads to windfall financial benefits to some companies and weakens the intended outcome of the CPRS. (Submission 774, p. 20)

The economic efficiency benefits of auctioning make it highly desirable to move progressively towards 100 per cent auctioning of permits over the longer term, as the need to deal with transitional equity considerations is expected to lessen, particularly after a global agreement on carbon emissions reductions. In addition, auctioning permits ensures that the entities who are responsible for high levels of emissions are the ones that pay for the environmental costs (consistent with the 'polluter pays' principle).

The Government has 100 per cent auctioning as a long-term goal, but achieving that goal will be contingent on global events. Some initial administrative allocations will be necessary to reduce the likelihood of carbon leakage in the period before broadly comparable carbon constraints apply internationally, and to provide transitional assistance to these industries. Some administrative allocations of permits will also occur to counter some of the one-off value impacts of a carbon constraint on strongly affected industries.

Policy position 9.1

Allocations will, over the longer term, progressively move towards 100 per cent auctioning as the Scheme matures, subject to the provision of transitional assistance for emissions-intensive trade-exposed industries and strongly affected industries.

9.4 Auction governance arrangements

The Government considers that the Scheme regulator will be best placed to manage ongoing auction policy design and operational matters, with wide discretion prescribed in the legislative framework (see Chapter 16).

However, providing the market with certainty about auction rules will require different arrangements at the start of the Scheme. This is particularly so because the Scheme regulator might not be established in time to develop and consult on a detailed auction strategy before the first auction is held. Until the auction arrangements are established, operational flexibility within clearly specified objectives is desirable, because the auction design is likely to need to be fine tuned over time.

Green Paper position

The relevant minister would direct the regulator in the early phase of the scheme.

The scheme regulator would later assume all auction policy responsibilities.

The responsibilities of the scheme regulator, auction design, and the relevant minister's power of direction would be reviewed at the five-year review.

The Government has experience in auctioning other forms of property, and has taken into account the governance arrangements operating in those markets. For example, the Australian Office of Financial Management manages an auction process for Treasury Bonds on behalf of the Australian Government. Its governance arrangements are discussed in Box 9.3.

Box 9.3: Governance arrangements of the Australian Office of Financial Management

The Australian Office of Financial Management (AOFM) is a specialist Australian Government agency responsible for all operational aspects of Australian Government debt management. This includes the issuing of Treasury Bonds and Treasury Notes (a short-term debt instrument used to finance short-term funding needs) and the execution of debt-related derivative transactions. The AOFM is also responsible for managing the Australian Government's cash balance.

Although the AOFM is part of the Department of the Treasury, its finances are separate from those of the Department, as it is a prescribed agency under the *Financial Management and Accountability Act 1997*. It is accountable to the Treasurer and, through him, to the government, the parliament and the public.

Tender objectives

Treasury Bond issuance is undertaken to maintain liquid and efficient Treasury Bond and Treasury Bond futures markets. Issuing bonds by tender ensures that the process is highly transparent, equitable and competitive. This results in the sale of Treasury Bonds on the most favourable terms possible for the government; that is, the lowest interest cost.

Box 9.3: Governance arrangements of the Australian Office of Financial Management (continued)

Authority to issue

The *Commonwealth Inscribed Stock Act 1911* gives the Treasurer, by delegation from the Governor-General, power to issue Treasury Bonds in such a manner and on such terms and conditions as he directs.

Each year, the AOFM seeks the Treasurer's approval for the total amount of Treasury Bonds to be issued in the next financial year. These details are published in the Australian Government's Budget Papers.

AOFM officers have been authorised to issue Treasury Bonds on behalf of the Treasurer. This gives the AOFM responsibility for all operational matters concerning the issuance of the bonds, including for establishing tender procedures, deciding the bond lines and amounts offered at individual tenders, and the timing of tenders. The AOFM publishes a debt issuance calendar outlining details of expected Treasury Bond tenders. The results of the tenders are published by electronic financial news services and on the AOFM website.

The governance arrangements for auctions need to reflect the limited time that will be available to the regulator from its inception to the first auction. Consistent with the preferred position in the Green Paper, the Government considers that it will be appropriate for the minister to be empowered to make a disallowable legislative instrument determining the auction process and operational rules during calendar years 2010 and 2011. After that time, the regulator will have the power to make such an instrument. In both cases, the primary objectives will be to promote the efficient allocation and price discovery of permits. This arrangement will best provide certainty for business.

It will be more efficient for the regulator to make adjustments to auctions than to require the responsible minister to approve small changes to auction design. Therefore, the regulator would be entitled to determine matters of detail, so long as the auction design was consistent with the auction design specified in the minister's legislative instrument. Auction design decisions and operational rules will be made public.

The roles of the minister and the regulator will be subject to review, as discussed in Chapter 16.

Policy position 9.2

- The responsible minister will be empowered to determine in a legislative instrument the auction policy and auction operation rules for calendar years 2010 and 2011.
- The regulator will be empowered to determine in a legislative instrument the auction policy and auction operation rules from 1 January 2012 onwards.
- The minister's determination will continue to have effect until it is replaced by an instrument made by the regulator.

9.5 Auction design features

To promote allocative efficiency and efficient price discovery a well designed auction will include:

- a large competitive field of bidders
- a simple system that encourages participation
- a stable set of auction rules that are not subject to arbitrary or unpredictable changes
- transparent processes that rapidly reveal price information
- minimal fees, charges and other costs of participation (although some rules to ensure that bids are credible will be desirable).

The remainder of this chapter sets out the Government's decisions on a range of auction design features. In arriving at these decisions, the Government has sought to ensure that the development of a deep and liquid secondary market is not compromised.

The Green Paper's detailed proposals on auction design drew heavily on a report on auction design by Evans and Peck, which was commissioned by the National Emissions Trading Taskforce. The Government's final positions on auction design have taken into account that report, stakeholder submissions, and further expert advice from Tradeslot Pty Ltd.⁹

9.5.1 Auction frequency

The Green Paper proposal on the frequency of auctions attracted considerable stakeholder comment.

Green Paper position

Four auctions would be held each financial year, one in each quarter. The Government seeks stakeholder feedback on the relative risks of alternative models, such as annual or weekly auctions.

Three factors are relevant to the auction frequency and auction ‘size’ (that is, the number of permits sold at auction):

- more frequent auctioning means smaller auction sizes
- auctioning more permits outside a Scheme compliance period means that there are fewer permits remaining for auction within the period, reducing the size of each auction
- the greater the proportion of permits that is administratively allocated, the smaller the size of the auctions

In theory, auctions could be held any number of times each year, for example weekly, quarterly or annually.

Box 9.4: International and Australian proposals on auction frequency

- The National Emissions Trading Taskforce proposed that auctions be held quarterly.¹⁰
- The Regional Greenhouse Gas Initiative, which has recently commenced, is to hold its auctions quarterly.¹¹
- The Task Group on Emissions Trading made no recommendations on auction frequency.¹²
- The Garnaut Final Report suggested regular auctions on a fixed schedule—weekly, monthly, quarterly or on any other basis that suited market participants.¹³
- No indication of auction frequency has been provided for Phase III of the European Union Emissions Trading Scheme¹⁴, or for the New Zealand emissions trading scheme.¹⁵

Several stakeholders requested that auctions be held more frequently than proposed in the Green Paper. For example, Stanwell Corporation Limited stated:

We consider monthly rather than quarterly auctions would provide participants with greater flexibility in managing cash flows while maintaining market depth.
(Submission 491, pp. 2–3)

ExxonMobil also expressed support for more frequent auctions:

ExxonMobil supports auctions being held as frequently as practicable (at a minimum monthly). (Submission 254, p. 9)

Frontier Economics, which prepared a report for the National Generators Forum as part of the joint submission from the Energy Supply Association of Australia, National Generators Forum, Energy Retailers Association of Australia and the Australian Pipeline Industry, also argued for more frequent auctions:

On balance, we believe there is a case for more frequent auctions than presented in the Green Paper. Thus, we consider that there may be a case for monthly auctions due to the

cash-flow benefits for participants ... and the likelihood of little drop-off in participation'. (Submission 715, Frontier Economics report, p. 3)

More frequent auctions will mean smaller auctions. The frequency of auctions and its impact on the size of the auction will have implications for:

- the reliability of price information revealed at each auction
- the timeliness of the price information
- the absorptive capacity of the market (that is, its ability to accommodate large transactions)
- the administrative cost to business and government
- liable entities' management of their cash flow and working capital.

Reliability of price information

More frequent auctions might reduce the reliability of the price information used to inform investment decisions early in the Scheme.

The auction will play an important role in disseminating price information to liable entities and market participants while the secondary market for permits is immature. The price signal should be as reliable and efficient as possible.

The price should reflect market expectations about the demand and supply of permits, and the bidding field should be competitive and representative of the broader market. Smaller and more frequent auctions could lead to a less competitive bidding field and compromise the accuracy of price information from the auction. To avoid this risk, the Government will need to ensure that auctions do not fall below the minimum size needed for competitive bidding.

Timeliness of the price signal

More frequent auctions could improve the timeliness of price signals, which would benefit businesses making investment decisions. For example, while the secondary market is immature, firms could review the price of auctioned permits when making decisions about abatement.

However, once the secondary market has matured, investors will have readily observable real-time market prices as they do in other markets.

Absorptive capacity of the market

The frequency and size of auctions may have implications for the absorptive capacity of the market (that is, its ability to accommodate large transactions). Smaller quantities of permits are likely to be more readily absorbed by the market, and more frequent auctions might enable it to absorb a larger number of permits.

Administrative costs

More frequent auctions involve a higher administrative cost for the regulator, and potentially for bidders. However, the capacity to hold auctions on the internet means that costs are unlikely to be an important factor in determining auction frequency.

Development of the secondary market

Some stakeholders were concerned that greater auction frequency might delay the development of the secondary market:

...holding auctions too frequently could potentially hinder the pace of secondary market development (Origin Energy submission 815, p. 64).

Quarterly auctions would be sufficient to underpin a robust and regular process of price discovery and avoid the administrative overhead of more frequent auctions (the Australian Securities Exchange submission 811, p. 4).

Cash flow and working capital management

A number of stakeholders cited cash flow and working capital management as reasons for holding more frequent auctions. The Government understands that these issues are of particular concern following recent global financial events and the resulting uncertainties for businesses in Australia and overseas.

Concerns about working capital relate to the timing difference between the purchase of permits and their surrender to meet Scheme obligations. Many stakeholders were concerned that they would be required to borrow to purchase permits many months or even years in advance. Some were concerned that recent financial market uncertainty would mean that they would not be in a position to borrow the required funds or would be forced to pay interest rates that they could not afford.

Most of these stakeholders suggested monthly auctions, on the grounds that this would enable them to better manage their liabilities and reduce their working capital or debt financing costs. For example, TRUenergy argued that:

A monthly auction with weekly settlements aligned with the [National Electricity Market] settlement timetable will minimise the working capital and cash flow impact on affected energy market participants. (Submission 813, p. 14)

Some stakeholders, such as Caltex, supported weekly auctions because such auctions would reduce working capital requirements:

While this (weekly auctions) would incur some additional administrative costs, such costs would be greatly outweighed by the reduction in working capital requirements that would be incurred with less frequent auctions. (Submission 734, p. 11)

Frequent auctions may provide liable entities with an additional option for managing their obligations under the Scheme, particularly given any working capital or debt financing constraints they may have. For example, they might want to align their expenditure on permits

with their accruing liability over the compliance period. This is similar to the way businesses have developed strategies for managing their accruing tax liabilities.

In the presence of a functioning secondary market, the frequency of auctions should not affect liability management or the costs of working capital or debt financing. Permit prices, like prices of other financial assets, are expected to, on average, yield a return equal to a market interest rate sufficient to compensate investors for the risk of holding permits. Because permits do not pay dividends or interest, like shares or bonds, the return will come in the form of capital gains. That is, on average, permit values (prices) would be expected to rise at the market interest rate.

The permit interest rate and permit prices will also reflect economic conditions and the cost of capital. Lower economic growth or constraints on credit will reduce demand and cause the carbon price to be lower and permits to be more affordable for business. Because of this, the timing and frequency of permit purchases at auction will have a more limited effect on the current dollar cost of permits to businesses with similar costs of capital. Box 9.5 provides a stylised example of how this might operate in practice.

Box 9.5: Financial implications of the timing of permit purchases

Consider the case of a business seeking to determine the optimal time to purchase pollution permits before surrender date. The business knows that it is liable for a certain quantity of emissions and, consequently, the number of permits it needs to buy. Assume that the permit market interest rate is 5 per cent and that the business has a cost of capital of 5 per cent.

In a well-functioning and liquid secondary market, the business has two broad options:

- Borrow money to purchase a permit for \$20 at the start of the year and hold for 12 months—total cost of \$21 (\$20 plus \$1 in interest).
- Purchase the permit at the end of the year, by which time the permit price has risen, on average, from \$20 to \$21 (\$20 plus a \$1 capital gain equivalent to the market interest rate).

In each case, the cost to the business will be \$21 at the end of the year (\$20 in current dollars at the start of the year). This general cost equivalence principle applies regardless of purchase frequency, for example, whether the business purchases half its permit requirements at two auctions each year or 1/52 of its permit requirements at 52 auctions each year.

In practice, results may vary slightly depending on each liable entity's cost of finance relative to the market interest rate attached to permits and the prevailing economic conditions. For example, liquidity constraints in credit markets may result in higher effective costs of capital to business. However, such constraints are also likely to increase the market interest rate on permits (as their prices fall in the near term).

Financial intermediaries can also provide a purchasing service on behalf of businesses that wish to spread their cash outflows over the course of the year. Where entities have a higher capital requirement, a financial intermediary could attend a quarterly auction and then on-sell proportionate parcels at monthly or weekly intervals to replicate the equivalent

An effective secondary market will also allow liable entities to purchase permits throughout the year. Auction sales and the ongoing trade of permits in the secondary market will be comparable with the issuance and subsequent trade in shares on the stock market. Even though there are relatively few initial primary market share offerings, shares are traded on all business days, and the secondary market is the share market's primary source of price information.

The Garnaut Final Report noted:

The frequency and timing of auctions will have implications for business cash flows and corporate balance sheets. Some entities with an obligation, such as fuel companies, will be required to purchase permits for all emissions from their fuel. Fears about this financial risk have led some fuel companies to suggest that auctions should be as frequent as weekly. The Review expects new financial services to emerge quickly around the Scheme, so that the market will be able to operate effectively across a range of frequency of auctions. (p. 332)

Consistent with this assessment, a relatively liquid secondary market in permits developed quite quickly in the European Union Emissions Trading Scheme. Some very small trades of derivative instruments for permits have even occurred in Australia. Those instruments incorporated forward prices of around \$19 for 2012.¹⁶ Therefore, with appropriate auction frequency, a market can be expected to develop quite quickly in Australia, giving businesses the necessary opportunity to secure regular and even daily purchase options all year around.

Assessment

The Scheme design should include frequent permit auctions while maintaining the size and efficiency of each auction. More frequent, smaller auctions are more easily absorbed by the market, present a lower risk in the event of an auction operational failure, and perhaps provide business with more flexibility while the secondary market is maturing.

However, more frequent, smaller auctions have a number of disadvantages:

- on average, they will have lower participation. If the number of permits sold at any individual auction is too low, only a few bidders might participate. The auction would then be more prone to manipulation and erratic pricing outcomes
- more frequent auctions could reduce the time businesses devote to information gathering and preparation, reducing the accuracy of some bids and the auction price signal
- they will result in higher transaction costs for the regulator and business, although online auctions can be run at relatively low cost and the incremental costs of additional auctions are likely to be small
- they may also reduce the level of activity in the secondary market, especially if auctions are double-sided (that is, allow liable entities to both buy and sell permits).

While quarterly auctions could be sufficient, 12 auctions throughout the financial year will accommodate stakeholder demand for greater frequency while not unduly risking the efficiency of the auction process. Section 9.5.8 discusses the resulting auction schedule and calculation of likely auction sizes.

Policy position 9.3

Auctions will be held 12 times throughout the financial year.

9.5.2 Option of deferred payment

A number of stakeholders, most notably those from the power generation sector, expressed concerns over their capacity as individual businesses to manage the cash-flow costs associated with their significant permit purchase obligations. They argued that auction participants should be able to defer payment for permits until the relevant vintage year (for example, pay for 2013 permits in 2013 even if the permits are purchased at a 2010 auction). This matter was not canvassed in the Green Paper.

For example, Loy Yang Power argued that a potential alternative option would be ‘for the cash settlement of permits purchased at auction not to occur until the end of the vintage year’ (Submission 661, p. 9), given that some organisations will find it difficult to establish cash or credit lines to allow forward hedging.

Similarly, TRUenergy argued that ‘Deferred settlement terms for permits with future vintages purchased at auction will also reduce participant cash management issues and credit support requirements’ (Submission 813, p. 14).

Deferred payment is likely to encourage participation in the auction of future vintages reducing the risk of low demand or unreliable prices for future vintages.¹⁷

The obligations of some electricity generators in the early years of the Scheme will be mitigated to some extent if they receive transitional support in the form of free permits. Nevertheless, some generators will still have to manage significant permit purchase obligations.

There are three broad options for deferred payments for permits:

- *Defer payment and receipt of permits*

Under this option the bidder does not pay for, or receive, their permit until the vintage year. To protect the Government from the associated credit risk, bidders would be required to provide a deposit, which they would need to top up if the market price fell below the agreed forward price. This system of deposit and margin call is similar to the futures contract arrangements at the Australian Securities Exchange.

This option places the Government in the role of financial service provider, which is likely to be administratively complex. Because the Government would be providing risk management services, this could also disrupt the development of a more efficient private sector futures market which will be needed to allow longer term risk management by business.

- *Defer payment, but with immediate receipt of permit*

Under this option, the bidder receives permits immediately but does not pay until the vintage year. This option places the Government in the role of financial intermediary, which is likely to be administratively complex and expose it to the risk of default (credit risk) to a greater extent than in the first option. The private sector, rather than the Government, is best placed to assess and manage this default risk. If the Government did not provide this service, firms would be likely to contract with financial intermediaries either to borrow money to buy permits or to have permits delivered at a fixed price at a later date.

- *Normal settlement arrangements (no lengthy deferral payment options)*

Under this option most bidders would pay for and receive permits at the time of the auction. However, bidders could defer payment (and receipt) for up to a maximum of 30 to 60 days. A financing charge equal to a prescribed interest rate would be charged. This option would expose the Government to the very small financial risks associated with short-term payment deferral and would not disrupt the development of either the secondary or derivatives markets.

When an efficient secondary market develops alongside the Scheme, liable entities will have a range of options to help them manage the price and volume risks of permit purchases and trade throughout the year. However, in the early phase of the Scheme as the secondary market develops increasing depth and liquidity, some may still choose to anticipate their permit liabilities and secure permits ahead of some revenue flows.

Liable entities will have an obligation to surrender permits for their emissions in the December following the emissions year, which finishes in June. With that flexibility, they will have ample opportunity to manage their permit purchases in line with their revenue flows.

Other scheme proposals and international experience provide limited guidance on optimal auction payment arrangements for a carbon market. The Task Group on Emissions Trading, the National Emissions Trading Taskforce and the New Zealand Emissions Trading Scheme did not make any specific recommendations about payment arrangements. In the European Union Emissions Trading Scheme, because of large-scale free allocations of permits, liable entities were not required to buy large parcels at auction, rendering payment terms irrelevant. Under the Regional Greenhouse Gas Initiative, financial settlement and transfer of permits to successful bidders occurred within 14 days of the first auction, although very loose caps under that scheme have meant very low prices (\$3 per tonne of carbon dioxide equivalent).

The Garnaut Final Report recommended against lengthy deferred payment, proposing instead that bidders apply for the right to purchase some permits closer to surrender date at the prevailing market price at that time:

On request, the independent regulator could issue emitters with a number of deferred payment permits (taken from the future release trajectory). For example some anticipated permit requirements over the next five years could be set aside for direct purchase at the time of surrender. These would be issued up to a maximum proportion (say, one-third) of expected annual requirements—enough amply to cover permits for which corresponding sales revenue had not been received at the time of surrender. These permits would allow payment for them to

be made at the time of surrender. The payment price would be the market price on the day of surrender or the average price over a preceding period. The effectiveness and need for these special measures should be evaluated at regular intervals. They should be disbanded once they are no longer necessary. (pp. 332-333)

However, the benefit of this approach is unclear because, by definition, bidders can already purchase permits at the prevailing market price at surrender date. It was also unclear how successful applicants would be selected.

Assessment

It will be important that, if allowed, deferred payment does not reduce the credibility of the auction; in other words, all bids made during the auction must represent both final valuation and capacity to purchase. This would require the creation of a contract through the act of bidding, and the imposition of substantive penalties for buyers who default. Further mitigation strategies could include not transferring ownership until the permit is paid for, and implementing extensive credit checks.

For these reasons, and to minimise fiscal risks to Government, options that involve the delivery of permits before full payment has been made and options that do not involve deposit arrangements will not be considered. Further, to minimise any disruption to the development of the secondary market which will be needed to allow longer term risk management by business any options considered would be of a transitional and strictly limited nature.

Policy position 9.4

The Government will consult with industry on possible deferred payment arrangements for auctions of future vintage permits of a strictly limited and transitional nature. Options that involve the delivery of permits before final payment has been received, or that do not incorporate the payment of a deposit, will not be considered.

9.5.3 Auction timing

The Government has had to decide on the within-year timing of auctions, and on the date of the first auction.

Within-year auctions

While market participants will need to know the total number of permits available for each compliance period and at each auction, giving participants opportunities to purchase permits before, during and after the compliance period is likely to be helpful. Holding an auction before the surrender date will allow them to reconcile their permit requirements once emissions data are finalised for the year. As discussed in Chapter 8, the Scheme will also allow limited borrowing of the subsequent year vintage, which will help to smooth market operation.

Green Paper position

At least one auction of the relevant year's vintage would be held after the end of the financial year in the lead-up to the relevant surrender date. A suggested date would be within one month prior to the surrender date.

Auction timing is less important in carbon markets than in some other markets, as the value of permits does not diminish with time as long as liable entities acquire them by the surrender date. This contrasts with the electricity and perishable goods markets, in which timing is critical and auctions must be held regularly. However, auction timing may have a role to play in reducing the risk of entities 'cornering' the market.

Holding one auction after the end of the financial year, within one month prior to the final surrender date will allow liable entities to reconcile their permit requirements after emissions data are finalised each year. It will also reduce the potential for market manipulation or 'cornering' of the market by providing a reliable government source of permits at surrender date. Together with unlimited banking of permits and oversight by the Australian Securities and Investments Commission, a very strong set of defences against perverse market outcomes is available.

Policy position 9.5

At least one auction of the year's vintage will be held after the end of the financial year in the lead-up to the final surrender date. This will be within one month prior to the final surrender date.

The first auction

The first auction could be held, in theory, at any time before the start of the Scheme or after the Scheme has commenced.

Green Paper position

The first auction would take place as early as is feasible in 2010, prior to the start of the scheme.

Some permits could be auctioned in advance of the start of the Scheme to provide early carbon price signals to businesses, enabling them to make more informed investment decisions. An early auction would also help to prompt the development of an active secondary market.

However, some practical considerations limit how early the first auction could occur.

The legislation establishing the Scheme must have commenced before the first auction takes place. The current timeline suggests that this will not be until the second half of 2009. The national registry will also need to be completed before the first auction of permits, to enable permits to be held in accounts in the registry (see Chapter 7).

For the auction to generate reliable price signals, the first auction should occur after participants have been able to develop informed opinions about overall demand and supply conditions. In practice, this means that they would need to know the Scheme cap (the supply of permits). As discussed in Chapter 10, final announcements about the cap will not be made until early 2010, although those announcements will simply give effect to the medium-term emissions trajectories announced in this White Paper.

Many liable entities will be required to monitor and report their emissions for the year ended 30 June 2009 under the *National Greenhouse and Energy Reporting Act 2007*. Once it is made public, that information will be useful for liable entities and financial market analysts in assessing value in the market. The first greenhouse and energy reports must be lodged in October 2009. This implies that the first auction could be held in early 2010. This will give the carbon market three to six months of trading time before the first compliance period begins.

Stakeholders that commented generally supported the Government's proposal to hold the first auction in early 2010, prior to the commencement of the Scheme. A few recommended an earlier start:

Auctions should commence earlier than 2010. The current lack of liquidity in the electricity sector will not be eased until permits are auctioned. (Loy Yang Power, Submission 661, p. 22)

Origin supports an auction as early as practicable before the scheme commences. Ideally, the first auction should take place in the second half of 2009. (Origin Energy, Submission 815, p. 66)

The practical considerations discussed above mean that an earlier auction is unlikely to be feasible. The Government's decision is consistent with its preferred position in the Green Paper, although the Government will work to ensure that the first auction takes place as early as possible.

Policy position 9.6

The first auction will take place as early as is feasible in 2010, before the start of the Scheme.

9.5.4 Advance auctions of future financial year vintages

The Scheme will have annual caps and surrender periods. Consistent with this approach, permits will also be differentiated by annual vintages; that is, each permit will pertain to a particular financial year Scheme cap.

Advance auctions

Permits may be auctioned in advance of their vintage financial year.

Green Paper position

The Government would support auctions of future year vintages.

Most stakeholders supported the auction of future year vintages. Supporters included the Australian Securities Exchange:

The auctioning of future-year dated permits to underpin re-purchase agreements and the short selling of derivatives will benefit the efficiency of forward price discovery and risk transfer. (Submission 811, p. 4)

Future vintages may be an alternative to the spot market and any associated derivative markets for liable entities seeking to manage future emissions obligations. For example, an entity could:

- wait until its future obligation arises and purchase permits at that time
- buy current vintage permits to use later
- buy the future vintage now in anticipation of the future obligation
- buy a derivative that will deliver the necessary permits to meet the expected future obligation.

In such circumstances, auctions of future vintages would provide liable entities with some additional flexibility.

Some stakeholders suggested that advance auctions will assist the development of price signals for future-dated permits and therefore assist in the creation of derivatives. However, in a market with banking and limited borrowing (see Chapter 8), the markets for current and future permits will be directly linked. In that case, the current spot price is expected to capture the market's assessment of the costs of meeting the broad carbon constraint over time.

Some stakeholders also argued for the issuing of vintages from distant future periods as a signal of Scheme credibility and longevity. This is similar to the approach proposed in the McKibbin–Wilcoxon hybrid model¹⁸ for climate change policy, which uses long-term permits partly to give investors a stake in the longevity and credibility of the Scheme. It could also be argued that the auction of more distant future vintages would create an obstacle to the eventual closure of the Scheme, as the Government might face a large compensation liability.

Advance auctions of future vintages are not required for carbon futures prices to emerge. For example, derivative markets have developed in the European Union Emissions Trading Scheme without advance auctions. While advance auctions can provide flexibility for liable entities and contribute to the credibility of the Scheme, they can also increase the complexity of auctions and reduce the number of permits of particular vintages available at each auction. Depending on how far in advance vintages are auctioned, the Government's flexibility to set caps could be reduced over time. The extent of these disadvantages will depend on how many future vintages are auctioned.

The key advantage of the advance auction of future vintages is that advance auctions would give entities trying to manage future emissions liabilities an alternative to buying up and hoarding the current year's permits.

Policy position 9.7

The Government will advance auction future vintages.

Number of future vintages to be auctioned

A further consideration relates to the number of future vintages that can be auctioned.

Green Paper position

Four years of vintages would be auctioned (current vintage plus advance auction of three future vintages).

Some international and other Australian scheme proposals are discussed in Box 9.6.

Box 9.6: International and other Australian scheme proposals

The expert auction report by Evans and Peck, commissioned by the National Emissions Trading Taskforce, recommended quarterly auctions of current year vintages and auctions of three future year vintages once a year (to be conducted simultaneously with one of the current year auctions).¹⁹

The taskforce proposed auctions of current year and future year vintages.²⁰ However, it noted ‘scope for further work to refine timing and frequency as detailed scheme design progresses’ and that, in particular, ‘consideration should be given to the different incentives faced by bidders in relation to timing’. The Garnaut Final Report²¹ proposed one to two years (spot plus one future vintage), and the Regional Greenhouse Gas Initiative²² four years (spot plus three future vintages).

The European Union Emissions Trading Scheme²³ and the New Zealand Emissions Trading Scheme²⁴ do not include advance auctions of future vintages.

Advance auctions of future vintages give businesses options for hedging future obligations rather than hoarding early vintages, although the utility of such auctions is likely to diminish rapidly for far-dated vintages, particularly when stakeholders have the option of banking permits. A greater number of future vintages will increase the number of auctions per vintage, thereby reducing the average auction size and efficiency. In addition, because simultaneous auctions are desirable to promote efficient price discovery, the complexity of auctions also increases with the number of vintages auctioned at the one time.

A number of stakeholders favoured the advance auction of additional vintages beyond the four proposed in the Green Paper, generally for long-term risk-management purposes. Among these, most requested auctions of a total of five vintages. For example, BP Australia stated that it was:

supportive of the Green Paper’s position to auction four vintage years (current + three year future), however, BP would prefer to extend this out to five years

(current + four year future), in line with emission cap timing. (Submission 355, p. 10)

Other stakeholders in favour of additional years of vintages included the Bureau of Steel Manufacturers of Australia, which recommended:

an increase in the number of future vintages to be auctioned (minimum 10 years). This would extend visibility of permit prices further into the future, thereby better informing investment decisions about long-lived assets and enabling hedging. (Submission 408, p. 37)

The Government supports the auctioning of future year vintages because of the benefits for businesses, as discussed above, and because auctioning also reduces the incentive for businesses to hoard permits of early vintages, promoting liquidity in the system.

The Government considers that auctioning four vintages (current vintage plus advance auctions of three future vintages) should be sufficient to promote efficient forward price discovery, help entities to manage future price risks, and promote the development of an active secondary market in future vintages. Over time, as the secondary market matures and is opened more broadly to international trade, the need for auctioning future vintages is likely to lessen.

Policy position 9.8

Four years of vintages will be advance auctioned (current vintage plus advance auctions of three future vintages).

Frequency of advance auctions

A further consideration relates to the consideration of advance auctions.

Green Paper position

The advance auction of future year vintages would occur once each year.

Box 9.7: Frequency of advance auctions in international and other scheme proposals

Under the Regional Greenhouse Gas Initiative²⁵, auctions are held quarterly and future allowances are made available up to four years in advance of their vintage. Under the initiative, it has been recommended that an auction of current vintage year allowances and an auction of a future vintage be held on each of the quarterly auction days. First-quarter auctions would include an auction of allowances from the one-year-ahead vintage, second-quarter auctions would include an auction for the two-year-ahead vintage, and so on.²⁶

Evans and Peck also recommended quarterly auctions in their report to the National Emissions Trading Taskforce. However, they recommended that the auction of future vintages be held only in the second quarter of each compliance year.

A higher frequency of advance auctions would decrease the number of permits of a particular vintage at each auction, thus reducing auction efficiency. One auction of future vintages per year will be sufficient to gain the benefits from advance auctions while maintaining the efficiency and simplicity of the Scheme.

Few stakeholders commented on this issue. Those who did comment generally argued that advance auctions for future vintages should be held more frequently than once a year to aid the development of the secondary market and smooth price discovery. For example, Westpac stated that it:

would also support the advance auction of future year vintages several times a year, rather than once a year as proposed in the Green paper. The rolling availability of future vintages would help develop secondary markets, such as the 'repo' market, and promote smooth carbon price discovery. (Submission 695, p. 8)

The frequency of advance auctions for future vintages is likely to be less important than it is for the current vintage. Subject to any borrowing allowance, future-dated permits cannot be surrendered until the year of their vintage. This lead time provides flexibility, which renders the short-run liquidity (the capacity to buy at short notice) of the market less critical. Many businesses are likely to plan for their future vintage permit needs at one stage during the year, and annual auctions of future vintages would align with this.

As additional advance auctions would not provide clear benefits, and to maintain the efficiency and simplicity of the auction, an advance auction of future vintages will occur just once each year. Section 9.5.8 outlines a potential auction schedule consistent with this approach.

Policy position 9.9

Advance auctions for each future vintage will be held annually.

9.5.5 Auction participation

The Green Paper's proposal that the lodgement of a security deposit would be the only limit on auction participation attracted a range of comments from stakeholders. Universal participation would allow non-liable entities, including financial intermediaries, to participate in auctions.

Green Paper position

Subject to the lodgement of any required security deposit, universal participation would be permitted at auctions.

Some stakeholders opposed this proposal, raising concerns that the participation of non-liable entities in auctions may result in speculation and the bidding up of prices. For example, Woodside Energy Limited argued that, to ensure market liquidity and eliminate price risk, the Government should:

limit participation, at least initially, in government permit auctions and restrict eligibility to register ownership of permits to firms which are emitters or which have permit surrender obligations under the scheme. (Submission 485, p. 27)

Similarly, the Australian Food and Grocery Council argued that:

Allowing financial markets to participate in the auctioning process invites the possibility of manipulation over the carbon trading system, leaving genuine purchasers of permits at a disadvantage. While there is a potential need for financial services in an established carbon market the Government should ensure that an appropriate level of control is maintained to prevent distortion. (Submission 831, p. 14)

However, limiting auction participation would have a number of disadvantages:

- As noted in Section 9.5.1, an auction is more likely to deliver reliable price signals if the field of bidders is competitive. Restricting the number of bidders would reduce the competitiveness of the bidding field and increase the scope for market manipulation.
- Smaller liable entities might prefer to use specialist financial intermediaries to help them manage their emissions obligations over the year, rather than directly participating in auctions. Not allowing intermediaries to participate at auction reduces their ability to provide such services. It would also give liable entities an unfair advantage in the secondary market over others who seek to provide such services.
- In practical terms, it would be difficult to limit participation and enforce a restricted auction Scheme, as excluded entities could simply contract with liable entities to buy permits on their behalf.
- For liable entities to be able to manage their carbon cost price risks, they are likely to want to enter into hedging contracts. Not allowing other players, including financial market participants, to buy permits at auction is likely to slow the development of such hedging products, which would have the perverse outcome of making price risk less manageable.

However, to ensure that auctions are competitive and free of manipulation, steps will be taken to ensure that bidders are credible. Those measures may include some form of financial guarantee or cash deposit to ensure that bidders will be able to pay for the permits they buy at auction, and to encourage only genuine participants. Depending on the number of permits a bidder acquires and the price at which they are acquired, either the deposit would be returned or the bidder's payment would be reduced. This is a standard feature of many auctions. The Government also plans to limit the maximum parcel of permits that can be purchased at any one auction to 25 per cent of the available amount (see Section 9.5.7). Finally, all bidders will be required to have a registry account with the regulator (see Chapter 7).

Policy position 9.10

Subject to the lodgement of any required deposit and having a registry account, universal participation will be permitted at auctions.

9.5.6 Auction type

Several potential auction types are applicable to the sale of carbon permits. The main decisions are:

- whether the auction is a ‘sealed bid’ auction, or an ‘ascending clock’ auction
- whether auctions will be held sequentially or simultaneously.

The choice of auction design depends on how many permit vintages are being sold at once, and whether those vintages are close substitutes.

Green Paper position

Ascending clock auctions would be used for single vintage auctions.

Ascending clock

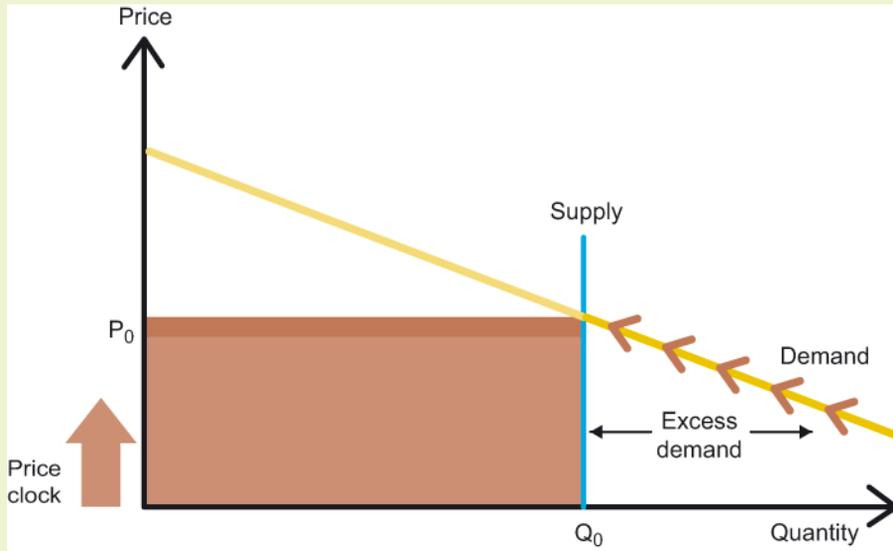
In an ascending clock auction, the auctioneer announces the current price. Bidders indicate the number of permits they are prepared to purchase at that price. If demand exceeds supply, the auctioneer raises the price in the next round and bidders resubmit their bids. This process continues until the number offered is equal to or greater than demand. Bidders then pay the price from the previous round.

Ascending clock auctions can also allow proxy bidding, in which bidders submit in advance their demand schedule for permits at various prices. These bidders would not need to participate further in the auction (see Section 9.5.7 for this and other operational features). This enables bidders to submit bids, as would be done under a sealed bid system, if this is more convenient (see below).

The ascending clock auction also provides information on the aggregate demand schedule (see section 9.5.7) at the end of the auction, which promotes efficient price discovery in the secondary market.²⁷

Box 9.8 outlines the operation of an ascending clock auction.²⁸

Box 9.8: Ascending clock auction



Source: P Cramton, 'Comments on the RGGI Design', University of Maryland, 2007.

Sealed bid

In a sealed bid auction, the auctioneer announces the number of permits to be sold. Bidders then submit sealed bids, which only the auctioneer sees. The auctioneer then allots the permits to the highest bidders. The auctioneer can choose to charge the price offered by the lowest successful bidder (uniform price) or have bidders pay the prices bid (pay-as-bid).

A few stakeholders commented on sealed bid auctions. Most were liable entities that preferred the sealed bid process because of their familiarity with that auction type.

For example, Origin Energy stated:

Origin's preference is for a simple sealed bid, uniform price auction. Compared with an ascending clock auction we believe this design is likely to be easier to understand and implement, has lower implementation costs and is less prone to strategic manipulation. (Submission 815, p. 69)

BP Australia stated:

BP recommends the use of a sealed bid auction, enabling companies to enter schedules of different volumes and prices in advance. This style of auction would follow a similar format to that of the Settlement Residue Auctions currently undertaken by NEMMCO within the National Electricity Market. (Submission 355, p. 10)

Financial market stakeholders, where they commented, supported the Government proposal for ascending clock auctions. For example, Westpac stated that:

this (ascending clock) is the most efficient and transparent approach for this kind of market. (Submission 695, p. 9)

Frontier Economics, in its report prepared for the National Generators Forum, also supported the ascending clock format:

Having considered the options, we tend to favour the ascending-clock design for its open and transparent process and price discovery characteristics. (Submission 715, p. 19)

Some concerns were raised that ascending clock auctions make collusion easier. However, the ascending clock auction is unlikely to be susceptible to collusion in the context of the Australian Scheme because of the number of liable entities under the Scheme, each of which has only a small proportion of the total Scheme obligation. Such a dispersed set of small bidders would be hard to organise for the purpose of collusion. The presence of financial market participants at auction would further limit the potential for collusion by providing a secondary check on auction prices.²⁹

The Government initially favoured ascending clock auctions for a number of reasons, including their transparency of operation, and because they allow small players to ‘free ride’ on the information sets of larger players. With sealed bids, small players have no access to market information during bidding and could miss out on an allocation because of strategic bidding by larger operators.

However, to accommodate some stakeholders’ desire for simplicity, the Government will allow ‘proxy bidding’, as described above. Proxy bidding will replicate some of the advantages of a sealed bid auction, even where the auction type is simultaneous ascending clock.

Frontier Economics supported this position in its report for the National Generators Forum:

The addition of proxy bidding adds additional flexibility to the ascending-clock format and allows bidders who wish to treat the auction as a sealed-bid format, or those who wish to be absent from the auction, to do so. (Submission 715, p. 32)

Policy position 9.11

Simultaneous ascending clock auction is the preferred auction type with bidders having the option to submit proxy bids in ‘sealed bid format’ for convenience.

Sequential or simultaneous advance auction

Where multiple vintages are being sold at one auction, they can be sold simultaneously or sequentially. This issue is separate from the question of how many auctions of each future vintage will occur each year, which is dealt with in Section 9.5.4.

Green Paper position

Simultaneous ascending clock auctions would be used for multiple vintage auctions.

In a sequential auction, each vintage is sold in a separate auction, one after another. Sequential auctions are the simplest auction type to administer and are ideal when the values

of the auctioned goods are unrelated. However, they can lead to inefficient prices when goods are substitutes, as is the case in multiple vintage auctions. Inefficient relative pricing can occur because bidders cannot see the prices of other vintages when bidding and must second guess the price of vintages yet to be auctioned. This can result in demand at the earlier auctions being too high or too low, depending on the views of bidders. In turn, this will increase or decrease demand at future auctions, leading to inefficient price differentials between vintages.

In a simultaneous auction, all vintages are auctioned simultaneously using multiple ascending clocks. The auctioneer announces the price of each vintage in each round, and the number of rounds per vintage depends on the time it takes to complete the auction process (that is, until the supply of permits exceeds demand at the final price).

Simultaneous auctions are more complicated because bidders must monitor all auctions at once, but can result in more efficient relative prices of goods as bidders can watch prices evolve as they make their decisions. Simultaneous auctions are much more likely than sequential auctions to deliver reliable relative prices between vintages. Bidders could pre-specify the value differential at which they will switch vintages to ensure that they obtain the right vintage at given price levels. This superiority of price discovery means that, despite their complexity, simultaneous auctions are preferable when auctioning multiple types of goods (such as different permit vintages). Given modern, internet-based, auction platform technology, the complexity of simultaneous auctions can be managed at relatively low cost.

Sequential auctions are simpler and faster, but they can lead to anomalous pricing outcomes for vintages that are close substitutes. Simultaneous auctions are slower but are less likely to deliver anomalous outcomes.

Policy position 9.12

Simultaneous ascending clock auctions will be used for multiple vintage auctions.

Single-sided or double-sided auctions

The Government must decide whether to allow auction participants to sell as well as to buy permits. An auction that allows both buying and selling is known as a ‘double-sided’ auction.

Green Paper position

Only those entities that receive free permit allocations would be allowed to sell them through double-sided auctions in the early phase of the scheme.

A double-sided auction provides a low-risk, low-cost and transparent mechanism for entities that have received a free allocation of permits to sell them on the carbon market. Reducing risks and transaction costs through a double-sided auction would also encourage those with an excess of free allocations of permits to sell them on the market.³⁰ This may increase the size of the auction and the liquidity of the secondary market by discouraging hoarding.

Frontier Economics supported double-sided auctions in its study on behalf of the National Generators Forum:

A double-sided auction has the potential to improve auction efficiency and the accuracy of the final permit price due to the ability for a larger number of buyers and sellers to compete. (Submission 715, p. 23)

However, providing a double-sided auction facility for all market participants (rather than only those with free allocations) may disrupt the development of the secondary permit market by crowding out investment in alternative trading systems (for example, stock exchanges and over-the-counter markets). This was noted by the Australian Bankers' Association:

Double-sided auctions would introduce unnecessary complexity and hamper development of the secondary market. (Submission 1036, p. 14)

Therefore, it is reasonable to restrict this facility to entities with free allocations, and to shut it down after a short transition period.

Policy position 9.13

Entities receiving free permits will be able to sell these at auctions (double-sided auction design) occurring in calendar years 2010 and 2011.

9.5.7 Operational features of the auction

Over time, the secondary market will provide a range of services that better facilitate trading and risk management. However, such services might be limited in the short term, which may effect the efficient operation of the secondary market. Therefore, the Government has a role in providing some transitional auction services to reduce this implementation risk.

The following auction features will facilitate and encourage the participation of liable entities in the early years of the Scheme, as familiarity with and confidence in the new environment develops.

Uniform pricing

The ultimate price paid per permit will be identical for all successful bidders, regardless of their respective valuations. This is a natural outcome of the ascending clock system, and one that does not discriminate between bidders.

Aggregate demand revealed each round

At the end of every auction round, the auctioneer will provide information on the number of permits demanded by participants at the current price. To avoid collusion, individual bids will not be published.

Proxy bidding

Proxy bidding allows bidders to delegate actions to the auctioneer by submitting a set of bidding rules. Bidders can submit their permit demand schedules and then receive the amount specified at the final auction price. Proxy bidding in sealed bid format will not interfere with the operation, transparency or efficiency of the ascending clock auction; it simply automates

bidder preferences. It does not remove the round-by-round disclosure of aggregate demand by the auctioneer.

Publication of auction results as soon as feasible

The market will be informed of the results of auctions in a timely fashion. As the auction system will be fully automated, results will be released within seven days of each auction.

Reserve price

The auction will have a reserve price set well below the expected market price. This is in line with arrangements in the United Kingdom under the European Union Emissions Trading Scheme. The reserve price will increase efficiency by limiting the abuse of market power or collusion by entities, and accelerating the auction process. It is an administrative mechanism aimed at improving the speed and efficiency of the auction and is not intended as a price floor in the market. Unsold permits will need to be sold at future auctions.

Internet auction platform

Auctions will be conducted using an internet platform. The internet platform will encourage more entrants and greater competition because it is low cost and readily accessible.

Parcel size

Bidders will be restricted to parcel sizes of no more than 25 per cent of the total number of permits sold at each auction. As there are to be 16 auctions, (section 9.5.8 refers) this implies bids of no larger than around 1.6 per cent of total permits issued for a given vintage. The advantage of imposing a maximum parcel size is that it reduces the potential for large entities to monopolise the market for permits—which stakeholders raised as an important concern. The trade-off is that this is likely to inhibit the flexibility of the market. However, around 1.6 per cent should be sufficient, given that the largest single entity is estimated to account for around 3.5 per cent of total emissions. This would mean that the largest entity could buy all its requirements at just three auctions.

Activity rule

Bidders will not be permitted to increase the quantity of their bids as the auction progresses and prices increase.

User training

There is a need for education and training for stakeholders before the first auction is held. It is proposed that a process be made available to bidders to participate in mock auctions, to allow bidders to familiarise themselves with the auction process. Mock auctions will be voluntary and will reduce implementation risk when the first auction is held. A program of training around the auction system will also be developed for users.

9.5.8 Possible auction schedule

The auction schedule will be based on the following final auction policy positions as detailed in this Chapter:

- Auctions will be held 12 times throughout the financial year.
- At least one auction of the current year's vintage will be held after the end of the financial year in the lead-up to the final surrender date. This will be within one month prior to the final surrender date.
- The first auction will take place as early as is feasible in 2010, before the start of the Scheme.
- Four years of vintages will be advance auctioned (current vintage plus advance auctions of three future vintages). Multiple vintages will be auctioned simultaneously.
- Advance auctions for each future vintage will be held annually, with additional auctions for the first two years to facilitate Scheme start-up.

Box 9.9 contains a possible auction schedule consistent with these final policy positions.

Box 9.9: Possible timing of auctions and proportion of permits available at each auction in 2009-0 to 2011-12

	Financial years																							
	2009-10						2010-11												2011-12					
Vintage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010-11				1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
2011-12					1/16	1/16	1/16												1/16	1/16	1/16	1/16	1/16	1/16
2012-13						1/16	1/16												1/16					
2013-14							1/16												1/16					
2014-15																			1/16					

Note: Entries represent the fractions of permits from each vintage year cap excluding administrative allocations.

- 1 For an example of an analysis of an international experience see P Cramton, *Comments on the RGGI design*, University of Maryland paper, 2007.
- 2 Regional Greenhouse Gas Initiative, <http://rggi.org>.
- 3 Prime Ministerial Task Group on Emissions Trading, *Report of the Prime Ministerial Task Group on Emissions Trading*, Commonwealth of Australia, 2007.
- 4 National Emissions Trading Taskforce, *Possible design for a national greenhouse gas emissions trading scheme: Final framework report on scheme design*, 2007.
- 5 R Garnaut, *The Garnaut Climate Change Review: Final report*, Cambridge University Press, 2008.
- 6 New Zealand Government, *Framework for a New Zealand Emissions Trading Scheme*, 2007. In 2008, the New Zealand Parliament passed emissions trading legislation. Following the change of Government, the operation was suspended, but the current Government remains committed to a modified emissions trading scheme.
- 7 Proposal for a Directive of the European Parliament and of the Council 2008/0013 of 23 January 2008 amending Directive 2003/87/EC.

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- 8 P Cramton, 'Comments on the RGGI design', University of Maryland, 2007. The scheme commenced in September 2008 with a mandatory 25 per cent of permits to be auctioned, although many participating states have made a commitment to auction close to 100 per cent.
 - 9 Tradeslot Pty Ltd, *Report on key design elements of auctions under Australia's Carbon Pollution Reduction Scheme*, Final report, October 2008.
 - 10 National Emissions Trading Taskforce, *Possible design for a national greenhouse gas emissions trading scheme: Final framework report on scheme design*.
 - 11 Regional Greenhouse Gas Initiative, <http://www.rggi.org>.
 - 12 Prime Ministerial Task Group on Emissions Trading, *Report of the Prime Ministerial Task Group on Emissions Trading*, Commonwealth of Australia, 2007.
 - 13 R Garnaut, *The Garnaut Climate Change Review: Final report*.
 - 14 Proposal for a Directive of the European Parliament and of the Council 2008/0013 of 23 January 2008 amending Directive 2003/87/EC.
 - 15 New Zealand Government, *Framework for a New Zealand Emissions Trading Scheme*.
 - 16 The Australian Gas Light Company completed a future sale of permits, promising to sell permits equivalent to 10,000 tonnes of carbon dioxide equivalent emissions to Westpac on 1 February 2012, for \$19 per permit.
 - 17 Tradeslot Pty Ltd, *Report on key design elements of auctions under Australia's Carbon Pollution Reduction Scheme*, Final report.
 - 18 See for instance McKibbin, W. and Wilcoxon, P. (2007) 'Two issues in carbon pricing: timing and competitiveness', *Working Papers in International Economics*, April, No. 1.07, McKibbin, W. and Wilcoxon, P. (2006), 'A credible foundation for long term international co-operation on climate change', *Working Papers in International Economics*, June, No. 1.06, Lowy Institute for International Policy, Sydney; and also McKibbin, W. (2006), 'Why Australia should take early action on climate change', Lowy Lunch Lecture, December 13. Available at www.lowyinstitute.org.
 - 19 Evans & Peck, *Further definition of the auction proposals in the NETT discussion paper*, report to the National Emissions Trading Taskforce, 2007, available at <http://www.emissionstrading.net.au>.
 - 20 National Emissions Trading Taskforce, *Possible design for a national greenhouse gas emissions trading scheme: Final framework report on scheme design*.
 - 21 R Garnaut, *The Garnaut Climate Change Review: Final report*.
 - 22 Regional Greenhouse Gas Initiative, <http://www.rggi.org>.
 - 23 Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
 - 24 New Zealand Government, *Framework for a New Zealand Emissions Trading Scheme*.
 - 25 Regional Greenhouse Gas Initiative, <http://www.rggi.org>.
 - 26 P Cramton, 'Comments on the RGGI design', University of Maryland, 2007.
 - 27 Evans & Peck, *Further definition of the auction proposals in the NETT discussion paper*.
 - 28 P Cramton, 'Comments on the RGGI design'.
 - 29 Evans & Peck, *Further definition of the auction proposals in the NETT discussion paper*.

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- 30 This would most likely be the emissions-intensive trade-exposed firms in receipt of free allocations to cover both their direct and their indirect emissions costs. Their free indirect emissions allocations would need to be on-sold to provide the necessary funds to meet their higher electricity costs.