ACIL ALLEN CONSULTING

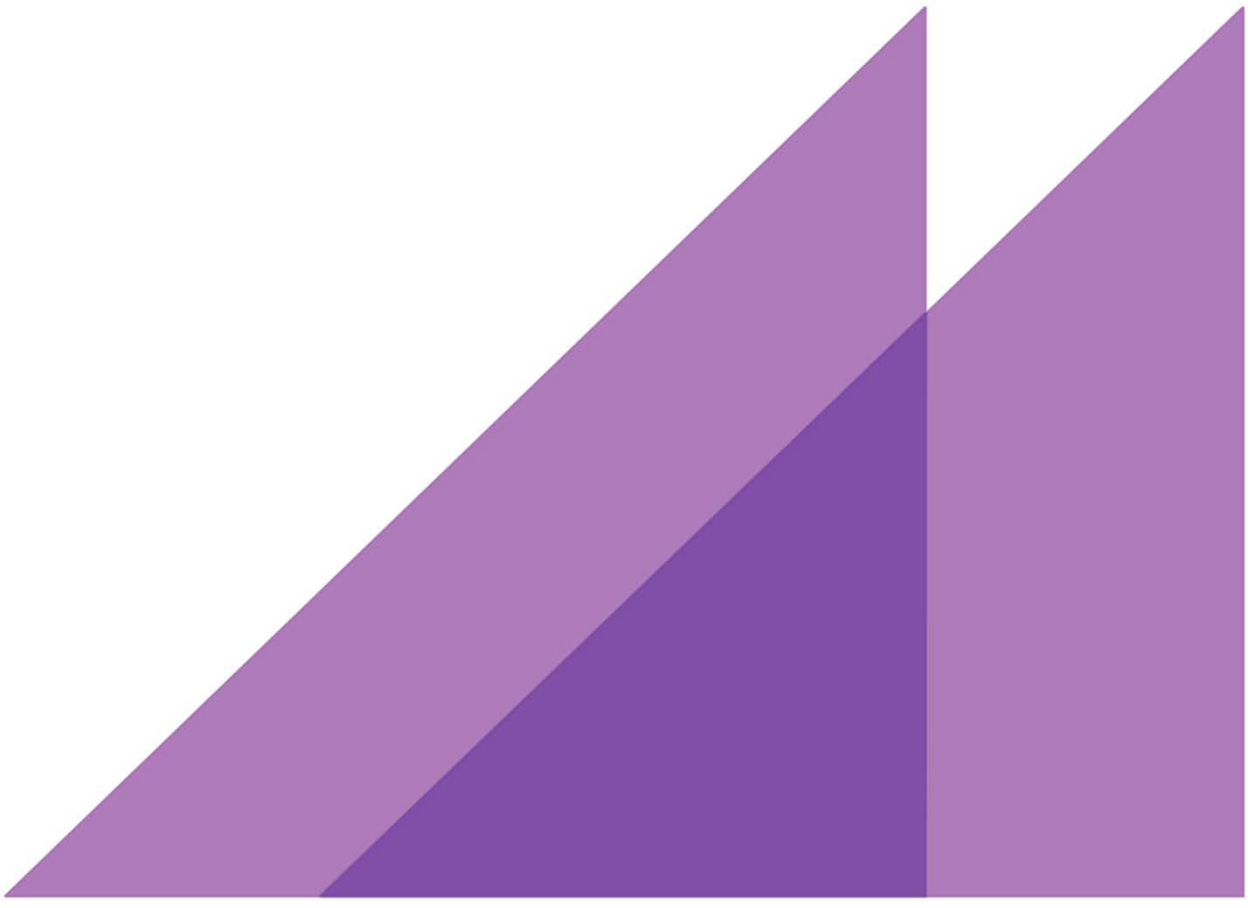
REPORT TO
THE PROPERTY COUNCIL OF AUSTRALIA

7 NOVEMBER 2013

DELIVERING ABATEMENT THROUGH DIRECT ACTION

EMISSIONS REDUCTION FUND – CONCEPT DESIGN AND PRACTICE

Version 3.0



ACIL ALLEN CONSULTING PTY LTD
ABN 68 102 652 148

LEVEL FIFTEEN
127 CREEK STREET
BRISBANE QLD 4000
AUSTRALIA
T+61 7 3009 8700
F+61 7 3009 8799

LEVEL TWO
33 AINSLIE PLACE
CANBERRA ACT 2600
AUSTRALIA
T+61 2 6103 8200
F+61 2 6103 8233

LEVEL NINE
60 COLLINS STREET
MELBOURNE VIC 3000
AUSTRALIA
T+61 3 8650 6000
F+61 3 9654 6363

LEVEL ONE
50 PITT STREET
SYDNEY NSW 2000
AUSTRALIA
T+61 2 8272 5100
F+61 2 9247 2455

SUITE C2 CENTA BUILDING
118 RAILWAY STREET
WEST PERTH WA 6005
AUSTRALIA
T+61 8 9449 9600
F+61 8 9322 3955

ACILALLEN.COM.AU

SUGGESTED CITATION FOR THIS REPORT

ACIL ALLEN CONSULTING, DELIVERING ABATEMENT THROUGH DIRECT ACTION: EMISSIONS REDUCTION FUND – CONCEPT DESIGN AND PRACTICE, SYDNEY, 2013

Contents

List of boxes

List of figures

List of tables

Glossary

Standard Offer	An offer into the ERF to provide a specific amount of abatement service activities within a specific period of time
ACCU	Australian Carbon Credit Unit
ACIL Allen	ACIL Allen Consulting
A-REIT	Australian Real Estate Investment Trust
BAU	Business as usual
BCA	Building Code of Australia
CER	Clean Energy Regulator
CFI	Carbon Farming Initiative
CO_2-e	Carbon dioxide equivalent
DOIC	Domestic Offsets Integrity Committee
ERF	Emissions Reduction Fund
ESS	Energy Savings Scheme (NSW)
GBCA	Green Building Council of Australia
GGAS	Greenhouse Gas Reduction Scheme
Guaranteed offer	An offer into the ERF to provide certain amounts of abatement that commits the bidder to purchase abatement to make up any shortfalls in abatement they are contracted to deliver but do not deliver
HVAC	Heating ventilation and air conditioning system
kg	Kilogram
Mt	Megatonnes
NABERS	National Australian Built Environment Rating System
NatHERS	Nationwide House Energy Rating Scheme
NGERS	National Greenhouse and Energy Reporting Scheme
Offset	Carbon abatement delivered or purchased by a business to reduce its net emissions and hence any potential penalty it may be subject to associated with its emissions being greater than its baseline. Such penalties may arise under the 'penalties for emissions above

	baselines' policy
Property Council	Property Council of Australia
RAE	Recognised Abatement Entity
REES	South Australian Residential Energy Efficiency Scheme
RET	Renewable Energy Target
ROE	Recognised Offsets Entity
sqm	Square metres
t	Tonnes
VEET	Victorian Energy Efficiency Target Scheme

Executive summary

The Australian Government aims to reduce Australian Greenhouse gas emissions by five per cent below 2000 levels by 2020. The government seeks to meet this target through its Clean Air (Direct Action) Plan which includes:

- 1) the purchase of carbon abatement from the market through an Emissions Reduction Fund (ERF) and repealing the carbon price mechanism; and
- 2) the introduction of a potential penalty regime for businesses emitting above their emissions baseline.

ACIL Allen Consulting (ACIL Allen) has been engaged by the Property Council of Australia (Property Council) to provide high-level advice on the design of the ERF and the potential penalty regime for businesses emitting above their emissions baseline, and to demonstrate how the property sector (including residential, non-residential and industrial property) could participate within the ERF. This report represents that advice.

Our recommended design for the ERF has been developed with a view to balance the competing needs underpinning the purchase of abatement – in particular it seeks to address the real-world factors that will be key to the scheme's success. These factors include: the need to meet Australia's emission reduction targets, the certainty of delivery of abatement, the efficient procurement of abatement, and promotion of market innovation and price discovery.

There are challenges associated with the policy to introduce penalties for businesses emitting above their emissions baseline. In this report we have discussed some of the challenges – principally associated with the definition of a baseline for both existing and new businesses – and how the baseline changes over time.

There is significant potential within the property sector for the delivery of carbon abatement. In 2010, the Allen Consulting Group[1] identified potential reductions of 46.7 Mt CO_2-e per annum by 2030 from the buildings sector associated with additional energy efficiency measures in the absence of the then-proposed Carbon Pollution Reduction Scheme, in work for the Australian Sustainable Built Environment Council Climate Change Taskforce.

Matters of detail about the ERF design and the penalty regime for emitting above emissions baselines will be developed following decisions about their high-level designs – this report limits itself to high level matters in general. The detail will be settled in the policy development and legislative process.

Announced aspects for the Emissions Reduction Fund

The Australian Government has announced that the ERF will have the following key elements:

- The ERF will purchase verifiable domestic abatement from the market, building on the existing Carbon Farming Initiative (CFI) and existing regulatory institutions (e.g. the Clean Energy Regulator (CER));

[1] The Allen Consulting Group, *The Second Plank Update: A review of the contribution that energy efficiency in the buildings sector can make to greenhouse gas emissions abatement*, 2010

- The ERF will purchase abatement at least cost using a reverse auction. The ERF will be source-neutral in purchasing abatement;
- The Australian Government will pay for abatement only after the abatement has been verified as having been delivered;
- The ERF will be provided with initial allocations of $300 million, $500 million and $750 million over the budget forward estimates period to purchase abatement.

Guiding principles for the Emissions Reduction Fund

The design of the ERF should:

- Procure more definite abatement – offers of abatement made by different parties operating in different industry sectors with quite different industry and regulatory circumstances will have different levels of certainty about the amount of emissions abatement that they will actually deliver in the future. To ensure that sufficient abatement is delivered to meet or contribute towards Australia's emissions reductions, the purchasing arrangements should place priority on selecting offers that are more certain or where there is a higher level of assurance that the offered abatement amount (and price) will be delivered.
- Promote price discovery – prices offered and accepted in the ERF should be disclosed and made easily available in order to provide price signals to inform potential providers and stimulate innovation in carbon abatement and increase the efficiency of future procurement.
- Promote allocative efficiency – the prices for abatement provided in successful offers should be the prices used in binding contracts.
- Maximise abatement within a fixed funding allocation – the ERF should operate to select the greatest amount of abatement within the fixed amounts of funding established by the government.
- Contribute towards meeting 2020 targets – this requires that the government give priority to purchasing abatement that would count towards the 2020 targets.
- Minimise transaction costs – the costs to government of contracting with abatement providers and auditing claims of delivered abatement should be minimised.

All of the objectives are important and many are interconnected. We place certainty at the head of the list because having the greatest confidence in the amount of abatement purchased contributes greatly to the achievement of the other goals and objectives.

Recommended key design elements for the Emissions Reduction Fund

The key elements of our recommended high-level design of the ERF are as follows.

- The ERF would purchase 'abatement services' through recurrent auctions with auction gateways where government makes procurement decisions that re-occur, possibly quarterly.
- Abatement services would be defined to include:
  - Specific new activities or projects that result in abatement; and
  - Alterations in existing practices resulting in abatement.
- Abatement services are limited to activities that produce abatement that is additional to what would be available under 'business as usual'.

Pre approved methodologies would provide a 'positive list' of activities that are deemed to go beyond common practice and drive additional abatement for different industries. The methodologies would provide detail about expected levels of abatement, as well as how abatement will be measured and verified. Methodologies might also specify circumstances where activities would not result in genuinely additional or verifiable abatement and so could not be bid into the auction (that is, provide a 'negative list');

- Abatement would be delivered at any time within an 'abatement delivery period' – the seven financial years following the auction. The offer could also include long-term abatement delivered after the end of the delivery period (e.g. over 25 years) to be discounted to the end of the abatement delivery period. It seems reasonable to set the discount rate to be used to longer term offers to the cost of government funds such as the 10 year Treasury Bond rate.;
- Parties would make offers to provide abatement services at any time in the three months before an auction, and could rebid and withdraw an offer at any time up to an auction gateway and offers would be made widely accessible;
- Offers would provide information about:
  - The person or party making the bid (and any other parties the bid is being made on behalf of);
  - The abatement services being offered that will lead to abatement (this could comprise multiple activities within one sector or across several sectors) often defined in terms of pre approved methodologies;
  - The quantity of abatement offered in each financial year (in tonnes) at each offered price – this represents the estimate of abatement volume that will be achieved;
  - The offered price(s) of abatement (expressed in $/tonnes);
  - If unspecified in the relevant methodology (which would only be expected in special circumstances), the conditions that constitute non-delivery of abatement;
  - Whether the offer is a 'guaranteed offer' or a 'standard offer'; and
  - Indication that the bid party accepts the rules of the auction and other arrangements.
- If government wished, other factors (e.g. holistic environmental benefits as well as regional community impacts) could be included as part of an offer;
- Abatement offers would be ranked by:
  - the offered price (in $/tonne) adjusted to incorporate the contracting transaction costs faced by government (advantaging offers for larger quantities of abatement); and
  - whether the offer was a guaranteed offer or an Standard Offer.
- Successful bidders in each auction would be identified by the ERF purchasing the lowest price offers first after taking the following factors into account:
  - Funding – each auction would be allocated a share of the ERF funding for that year;
  - To enhance certainty of abatement delivery, the ERF could:
    - purchase firm quantity offers before other offers;
    - allocate a minimum amount of funding to purchase some firm quantity offers; and/or
    - silo funds to particular industry sectors.
- Other factors (e.g. holistic environmental benefits) could be taken into account through auction tie-breaking rules;
- Each successful tenderer would be paid their bid price;

- There would be a minimal registration requirement for parties making offers into the auction; and
- Arrangements to meet shortfalls in abatement if they arise would depend upon the type of offer made and the contract that has been formed.
  - For guaranteed offers, bidders would have flexibility to improve performance of their abatement service methodology of up to a year. If shortfalls persisted in guaranteed offer contracts the abatement service provider could acquit the deficit by the purchase of guaranteed abatement offers from other registered parties that have made abatement bids, by the delivery of abatement through abatement services which would be eligible to be bid into the ERF, or by payment of penalties that reflect the prevailing price of abatement.
  - There would be penalties on bidders who had made 'Standard Offers' where the non-delivery resulted from factors within their control such as shortfalls in the amount of abatement service activity that was in the contract.
- Reflecting the different level of certainty around each type of bid and contact it is suggested that Government consider making a 50 per cent payment for successful guaranteed offers at the time that the contract is settled and provide the rest on performance and provide payment for standard offers when services are delivered (as abatement is realised over the abatement period).

Issues relating to penalties for above-baseline emissions

We have identified that the following issues need to be carefully considered in developing policy relating to potential penalties on businesses whose emissions exceed their baseline.

- The essential choice is between using absolute baselines or an intensity baseline.
  - Using absolute baselines may risk penalising businesses that expand production.
  - There may be challenges in calculating intensity baselines.
- Further choices relate to:
  - the appropriate level of calculation – e.g. whether it is at the business level or at the 'facility' level;
  - which emissions are included – e.g. whether only Scope 1 emissions are included, whether Scope 2 emissions are included, and/or whether embodied emissions are included; and
  - how baselines are reset over time.
- There are also issues of what level of penalties would be imposed, and whether there could be an offset regime for which businesses that emit above their baseline could purchase or create offsetting abatement so that the net emissions do not exceed their baseline.

Strategic situation of energy efficiency and the property sector

The Australian property sector is well placed to contribute abatement at low cost in well-designed auction arrangements.

Energy efficiency in the buildings sector could provide large amounts of abatement through the ERF.

Individual parties in the sector could contract to provide much larger amounts of abatement than could parties in many other sectors of the economy, reducing the transaction costs to government of meeting the 2020 emissions reductions targets. The property sector has strong experience in contracting for performance and would be a reliable vendor for significant sized agreements.

Many studies have identified that there is a great deal of potential to raise the energy efficiency of new and existing non-residential, residential and industrial buildings and that doing so would significantly reduce the demand for energy and in particular reduce the need to produce greenhouse gas intensive electricity.

While the technical potential to improve the energy efficiency of buildings has been verified in many studies, they also show that there are many economic and policy factors at play that impede the application of more energy efficient designs and technologies. Many of these factors essentially reflect market failures including problems with externalities, information shortfalls and owner-occupier issues.

It has often been suggested that there are net cost savings from the adoption of energy efficiency in the buildings sector. These estimates seem to overlook the various market failures and other factors that have posed significant impediments to the earlier realisation of the significant abatement potential of the buildings sector.

In contrast to many other industries, the property sector already has the means to measure its greenhouse gas emissions from energy use in buildings and to measure and verify the reductions in emissions that could be delivered from changes in energy efficiency.

NABERS (the National Australian Built Environment Rating System) is a national rating system that measures the environmental performance of Australian buildings and tenancies. It does this by using measured and verified performance information, such as utility bills. NABERS is managed nationally by the NSW Office of Environment and Heritage, on behalf of Commonwealth, state and territory governments.

All office building owners and lessors must undertake an energy rating assessment whenever their building with a net lettable area of 2,000 square metres or more is sold or let, or when a major refurbishment is undertaken. The energy rating is determined under NABERS. A star rating is assigned to buildings along with a 12 month certificate, which is publically shared on an online registry. There is already a national data base of NABERS Energy ratings for many non-residential buildings.

NatHERS (Nationwide House Energy Rating Scheme) is an Australia-wide tool allowing the determination of household energy efficiency ratings. Houses with higher NatHERS star band ratings are considered more thermally comfortable than houses with lower band ratings and the bands have been developed to allow comparisons of buildings within and between different climate zones (there are 69 climate zones as at the time of writing). Each NatHERS star band for a particular climate zone corresponds to a maximum thermal energy load per square metre per annum for houses in that zone.

It is likely that the buildings sector would represent a large source of potential abatement if abatement from energy efficiency is treated in the ERF on an equal footing with abatement from changes in the energy supply technologies (the focus of previous initiatives). Possibly of more importance, the property sector is a large source of verifiable abatement – government could have confidence that abatement claimed to have been delivered will in fact have been delivered.

Green Star – Performance is a rating tool operated by the Green Building Council of Australia (GBCA).

Green Star – Performance is designed to assess the operational performance of all existing buildings of types/uses (except single dwellings). Green Star – Performance is the only rating tool able to provide a comprehensive, holistic rating of building operations across nine impact categories: management, indoor environment quality, energy, water, materials, land use and ecology, emissions, transport and innovation.

The Green Star – Performance rating tool requires buildings that are eligible for a NABERS Energy rating (office, retail, hotel) to provide their rating as part of the required documentation for achieving Green Star – Performance certification, but for other building uses, Green Star – Performance has four compliance pathways for measuring energy performance and greenhouse gas emissions which could be adapted for measurement purposes under the ERF.

Types of abatement measures the property sector could offer

The property sector could be a source of abatement under the ERF. Examples of the types of ways the sector could provide abatement include the following.

- Refurbishment of an existing hotel – by increasing the energy efficiency of existing buildings, their rated energy use would decrease as would their greenhouse gas emissions.
- Improving the energy efficiency for an existing industrial building;
- Building a new shopping centre that is more energy efficient than the BCA section J energy efficiency benchmarks.
- Replacing an existing aged care building with a less carbon-intensive comparable building (where one off impacts resulting from the demolition of the existing building and embodied emissions in the materials also need to be taken into account).
- 'Tune-up'/retro-commissioning of an existing school building by rebuilding components of the heating ventilation and air conditioning system.
- Undertaking large-scale energy efficiency improvements across a residential property portfolio – by installing verified energy efficiency appliances and technologies, the rated energy use of individual properties would decrease as would their greenhouse gas emissions.
- Decarbonising or reducing the carbon intensity of the energy supply to individual buildings or to a property portfolio – by choosing a less carbon-intensive energy supply, greenhouse gas emissions would diminish. An example of this would be a business that is currently purchasing grid-supplied electricity changing its electricity retail contract to 100 per cent Greenpower.

High level implementation plan

The Australian Government has indicated that it intends to commence the new ERF on 1 July 2014. With this timeframe, an indicative potential implementation timeframe is as follows:

- 1 December 2014 – Government commences administrative work underpinning the operation of the ERF (including development of methodologies and registration of parties to participate in the ERF);
- 1 January 2014 – Government starts consulting on methodologies for activities not included in the Carbon Farming Initiative;

- January/February 2014 – Bill introduced into Parliament to establish the ERF;
- 1 March 2014 – parties can commence registering for the ERF;
- March/April 2014 – Parliament passes legislation; and
- 1 July 2014 – ERF commences operation.

1 This report

The new Australian Government has announced that it will shortly commence the implementation of its Clean Air (Direct Action) policy. This plan will be designed to efficiently and effectively source low cost emissions reductions through an Emissions Reduction Fund (ERF), building on the Carbon Farming Initiative (CFI), to assist in meeting Australia's emissions reductions target.

ACIL Allen Consulting (ACIL Allen) was engaged by the Property Council of Australia (Property Council) to provide advice on a potential high-level design for the ERF and on a penalty regime for businesses emitting above their baseline. This report is ACIL Allen's advice to the Property Council on the potential high-level design of the ERF.

Purpose

The purpose of this report is to provide thought leadership about the potential design of the ERF. The detailed policy design of the ERF will be developed through the policy and legislative process surrounding the ERF and are not addressed in this report.

Scope

The scope of this report was a preferred high-level design for the ERF and an approach to the penalty mechanism for entities whose emissions exceed their baseline. Appendix A lays out the detailed scope which was developed in consultation with the Property Council of Australia. The scope encompassed all key design issues for the ERF, recognising that the detailed design is to be developed through the policy and legislative process through to the anticipated commencement of the ERF on 1 July 2014.

Approach

ACIL Allen developed this report using the following methodology.

- The scope of the study and the elements of the design brief were agreed with the Property Council.
- The Government's recent policy announcements and Minister Hunt's speeches relating to Direct Action and the Emissions Reduction Fund were reviewed.
- ACIL Allen undertook desktop analysis about potential design elements of the ERF and internally workshopped potential design options.
- Initial thoughts on the high-level design were presented to senior representatives of the Property Council of Australia in early October 2013
- ACIL Allen drafted this report for the Property Council following feedback on its presentation and on a draft of the report.

In undertaking the analysis for this report, ACIL Allen drew on its experience in the areas of energy markets, ecosystem service markets (including carbon and environmental services), and sections of the economy including the property sector.

Structure of this report

This report is structured as follows:

- Chapter 2 discusses the overall approach and key design issues for the ERF and the 'penalties for emissions above a baseline' policy;
- Chapters 3-5 discuss elements of the ERF;
- Chapter 6 discusses issues relating to the 'penalties for emissions above a baseline' policy;
- Appendix A details the scope of this report;
- Appendix B provides information about NABERS star rankings and greenhouse gas emissions for Australian office buildings; and
- Appendix C provides information about NatHERS Star Band Criteria and energy use.

2 Overall approach and key design issues

This chapter discusses the new Australian Government's overall policy approach to tackling climate change and how the ERF contributes to that goal. It also discusses key issues for the design of the ERF.

Policy goal and architecture

The new Australian Government has a Four Pillar Environment Policy that includes tackling climate change through its Clean Air (Direct Action) policy. This policy has a number of principal components: purchasing carbon abatement through the Emissions Reduction Fund, repealing the carbon price mechanism, and potentially imposing penalties on businesses that emit above their baseline level of emissions.

As part of its environmental policies, the government will seek to achieve a reduction in Australia's net greenhouse gas emissions of five per cent below 2000 levels by 2020. According to the latest information, Australia's emissions in 2000 were 587 Mt CO_2-e (megatonnes of carbon dioxide equivalent) and a five per cent reduction equates to 558 Mt CO_2-e.[2]

The key focus of the ERF is the purchase of sufficient abatement to provide for – in concert with other policy instruments – the achievement of the carbon emissions reduction target. As Australia's overall net emissions will depend on economic, environmental, technological conditions and policy factors (among others), it is challenging to accurately forecast future net emissions (even under a 'business-as-usual' world) and consequently the total abatement that will be required to be purchased each year.

The government has indicated that it is confident that it will be able to purchase sufficient abatement in the first three years to assist the meeting of its emissions reductions target with budget allocations of approximately $300 million, $500 million, and $750 million over the forward estimates. It is likely that government has an implicit abatement target for each of these three years and considers that sufficient abatement is likely to be purchased at appropriate prices within those budget allocations.

The Department of Climate Change and Energy Efficiency has forecast that Australia would have 637 Mt CO2-e of domestic emissions in 2020 assuming that the Carbon Price Mechanism and the Carbon Farming Initiative were both operating.[3] While it is unclear how much abatement will be likely to be needed to be purchased under the Direct Action policy, it is conceivable that large amounts of abatement would be needed to meet the government's emission reduction targets.

---

[2] Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education, *The impact of Kyoto accounting changes on the QELRO and targets*, http://www.climatechange.gov.au/sites/climatechange/files/documents/06_2013/impact-of-kyoto-accounting-changes-on-the-qelro-targets.pdf

[3] Note that this figure may be inconsistent with the forecast emissions referred to earlier in this report as the forecast emissions were based on updated accounting tools.

The economic justification for intervention

The economic justification for government intervention into the emission of greenhouse gases is well known. It is well accepted that environmental goods – in this case carbon abatement – may be undersupplied by the market due to market failure (see box below). As a consequence, government intervention – in this case to purchase carbon abatement – is justified.

Box 1 **Market failure in ecosystem services**

Ecosystem services affect the wellbeing of individuals and the performance of firms. Yet this is rarely reflected in the financial incentives that parties face. Typically, those who supply ecosystem services are not rewarded for all the benefits they provide to others, and those who reduce ecosystem services do not bear all the costs they impose on others. This phenomenon is termed an externality.

The presence of externalities matters because it can lead to what is known as market failure. In particular, allowing parties to act in their own private interest can result in fewer ecosystem services than is optimal for society as a whole.

By definition, an externality occurs because there is no market for something that people care about. A market may not exist or may be imperfect because one or more of the following factors applies:

- large transaction costs;
- high uncertainty about the attributes of a good or service;
- asymmetric information (sellers are much better informed than buyers, or vice versa);
- few buyers and sellers; or
- ownership cannot be defined and enforced, or it is very costly to do so.

It is plausible that one or more of these properties applies to many ecosystem services. Arguably, the most prominent problems are high uncertainty about ecosystem processes and an inability to define and enforce ownership. Asymmetric information could also be important.

Source: Murtough G, Aretino B, Matysek A, *Creating Markets for Ecosystem Services: Staff Research Paper*, Productivity Commission, 2002

Using an auction to purchase abatement

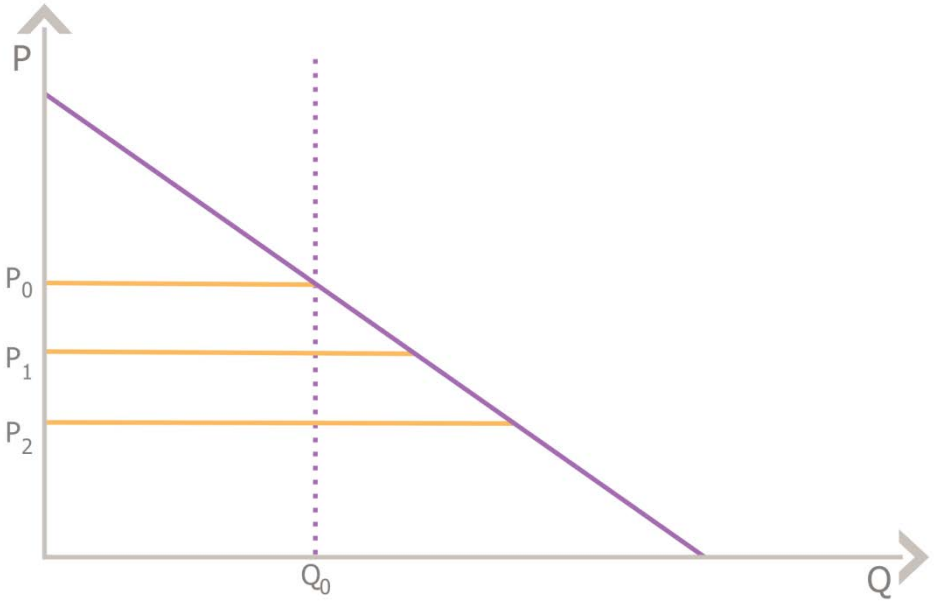
The government has indicated that it intends to use a reverse auction to identify sources of abatement to purchase. Governments frequently use auctions to purchase or sell goods and services. The Australian Government has stated that the ERF will be designed to efficiently and effectively source low cost emissions reductions by purchasing abatement 'up the cost curve'.

The auction has at least three purposes:

- to identify sources of abatement to purchase;
- to stimulate innovation and competition in the carbon abatement market; and
- to promote price discovery in the domestic carbon abatement market.

One of the key economic reasons to use an auction is to seek to discover a price of domestic carbon abatement services. Figure 1 gives a stylised demand-supply diagram for domestic carbon abatement services in which Q_0 is the implicit quantity of abatement required and P_0 is the marginal cost of abatement. P_1 and P_2 represent the prices of less expensive abatement that might also be purchased by government through the ERF.

Figure 1 **Price discovery of carbon abatement services**



Source: ACIL Allen 2013

What is to be purchased?

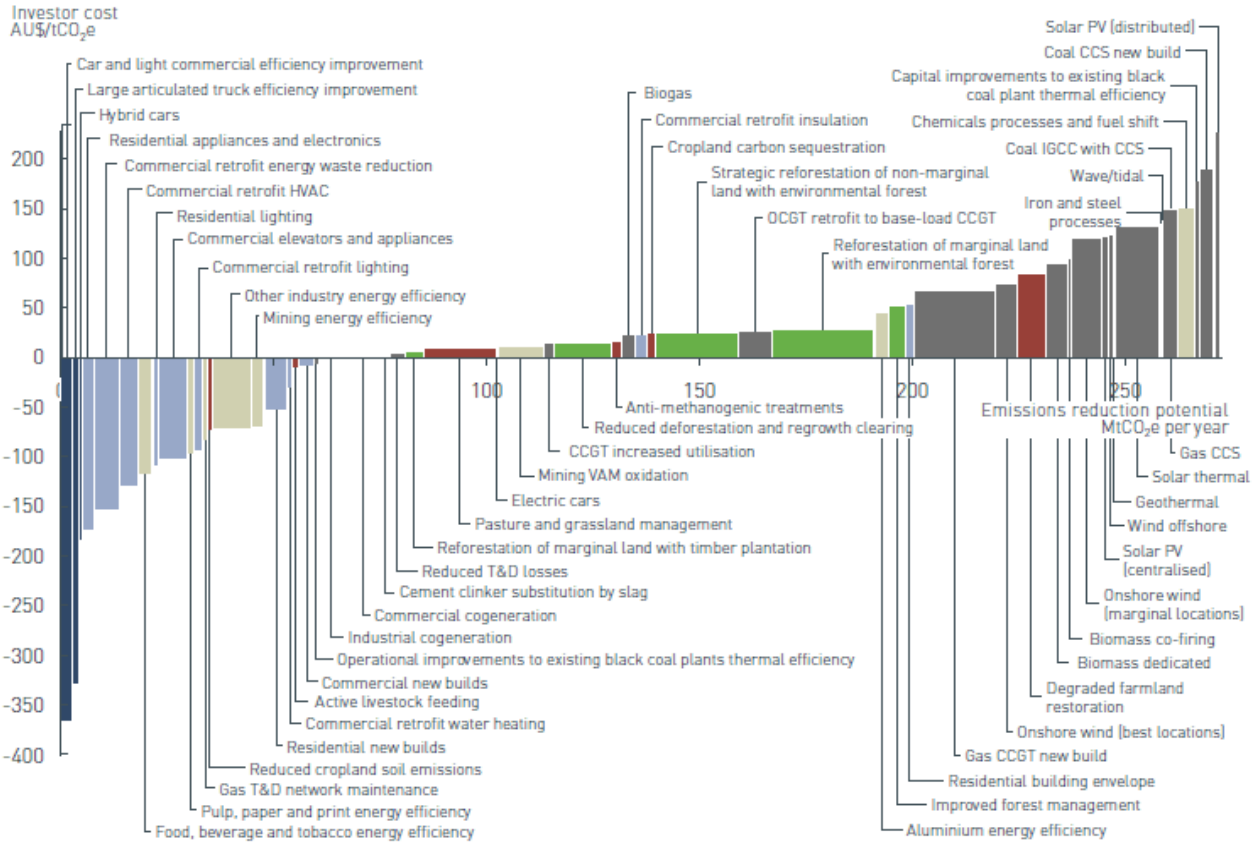
The Australian Government has indicated that the ERF will purchase source-neutral carbon abatement. As the ERF is to be source neutral, the ERF's framework must allow for as wide a variety of sources of abatement as possible to be offered for purchase.

It is anticipated that a number of sources of abatement might be able to offer abatement through the ERF. Minister Hunt has mentioned the following potential sources:

- cleaning up waste coal mine gas, power stations or capturing landfill gas;
- a mix of energy efficiency improvements in households, non-residential buildings and industrial facilities; and
- including reafforestation of marginal lands or revegetation or improvement of soil carbon.

The range of potential sources of abatement is very large as indicated in the ClimateWorks abatement cost curve in Figure 2 below. In principle, it encompasses new or additional actions and changes in existing practices on scales from the individual through to the sector-wide.

Figure 2 **ClimateWorks carbon abatement cost curve**



Source: ClimateWorks Australia, *Tracking progress towards a low carbon economy: 1. National progress report,* July 2013

Experience with the Carbon Farming Initiative

The Carbon Farming Initiative (CFI) provides some insight into the supply of emissions abatement in practice. The CFI is a voluntary offset scheme designed to credit greenhouse gas abatement in the land sector. Greenhouse gas abatement will be achieved under the CFI by either:

- reducing or avoiding emissions, for example by the capture and conversion of methane emissions from livestock manure
- removing carbon from the atmosphere and storing it in soil or trees, for example by farming in a way that increases soil carbon.

For abatement projects under the CFI, Australian Carbon Credit Units are issued for each tonne of CO2e sequestered or not emitted as a result of these activities. These units (carbon offsets or ACCUs) can then be sold to individuals, businesses and governments.

The CFI is expected to encourage farmers and landholders to adopt technologies or practices that would otherwise not be perceived as cost-competitive (ABARES 2013). The initiative may speed up the adoption of a new or existing practice or technology or make new and specific types of technologies, such as those with no or low productivity or other co-benefits, commercially viable while reducing emissions.

Additionality under the CFI

The CFI is underpinned by legislation that ensures offset credits are issued only for abatement projects that meet internationally recognised integrity standards. Adherence to integrity standards is essential to give the buyer confidence that the abatement they are buying is genuine.

Additionality is an important CFI integrity standard. A project is deemed to be 'additional' under the CFI if it results in abatement that would not have occurred in the absence of the scheme. That is, the abatement under the project can be considered beyond 'business-as-usual'. This includes the use of new technologies as well as changes in practices, where they are not widely used.

The definition of additionality in the legislation that supported the CFI excludes projects that are 'required by law (regulatory additionality) or activities that are common practice and already widely adopted'.

CFI methodologies

It is important to note that under the CFI producers are only credited with abatement credits after the abatement has been created and this has been reported and verified. The actual amount of abatement or offset credits is therefore not certain until they have been measured and verified. The main commitment that project proponents make is to the adoption and use of an approved CFI methodology.

The CFI methodologies set out the rules and instructions for undertaking projects, estimating abatement and reporting to the Administrator. CFI methodologies vary for different abatement activities, but they all contain:

- a description of the activity and how it reduces emissions or stores carbon
- a list of the emissions sources and sinks affected by a project
- instructions for determining a baseline that represents what would occur in the absence of the project
- procedures for measuring or estimating abatement relative to the baseline, and
- project-specific data collection, monitoring, reporting and record keeping requirements.

The Government has been working with industry, research organisations and other government agencies to develop methodologies that have broad application across the land sector.

The Broad Industry Context of the ERF

It is important to understand the real 'on-the-ground' contexts across various industries in designing the ERF auction to ensure the mechanism achieves the policy goals set for it. The ERF should not simply be seen as an expanded version of the CFI as the CFI covers essentially only one sector – the land sector – and was designed with that sector in mind. The ERF has to be conceptualised as being fit-for-purpose for all sectors and the existing knowledge and practice bases of other sectors are likely to vary dramatically from that of the land sector.

Some sectors are more ready to participate than others

Parties in some industry sectors may be more readily able to participate in the ERF in the short term relative to parties in other sectors. This is because parties in some sectors may:

- already have direct experience at being involved in the provision of abatement services (e.g. through the CFI or voluntary carbon markets);
- have already established agreed processes for verifying and measuring achieved carbon abatement;
- already use measurement and other systems that could be employed in the provision of abatement services.

In particular, we consider that parties in the land, energy efficiency, and stationary energy sectors are likely to have access to and potential experience of the use of tools which may also be useful under the ERF. Parties in some sectors might need to establish new or more robust measurement techniques before being able to fully participate in the ERF.

Large variation in the services offered and their characteristics

It is likely that abatement possibilities will vary dramatically in both their natures and the characteristics of the associated abatement. This is because abatement can be delivered through a very wide range of activities.

The characteristics in which abatement services could vary may include:

- scalability;
- timeframes for delivery;
- certainty of delivery;
- permanence of abatement; and
- cost.

Abatement services

Given the potentially wide range of sources of abatement envisioned in the ERF, with many different industries and technologies at play, there is a danger of losing focus on the behaviour change that is being sought. We view that a practical approach is to view what is to be purchased by the government as 'abatement services'.

This is unlike many other auctions in which the direct good or service is being sold or purchased - e.g. in housing auctions or on E-bay auctions.

Abatement services can be categorised as including:

- specific new activities or projects that result in abatement; and/or
- changes in existing activities and practices that result in abatement.

There would have to be agreed processes for determining the amounts of abatement that occur as a consequence of the abatement services that relate to the specific circumstances of many different industries. Such processes must be assessed by experts for each industry.

If government considered it useful, it might call for offers of abatement services for which the precise measurement and accounting procedures for determining quantities of delivered abatement have not been determined, accepting that the risks of achieving that abatement may be higher.

It is likely that the types of activities, new projects and changes in existing practices will vary dramatically both across and within different industries – in some cases it may be that the only common factor is that different types of activities result in verified carbon abatement.

Abatement may be delivered over a period of time

It is likely that many abatement services will yield abatement over a number of years as particular activities or changes in behaviour (such as improving energy efficiency in the property sector) will have ongoing impacts. Some projects may yield abatement for several decades. This potentially long-term abatement delivery has to be reconciled with the annual budget funding and the need to achieve the government's emissions reduction target by 2020.

Issue of partial information

Related to the readiness to participate, parties in many sectors may only have partial knowledge needed to deliver their contracted abatement services. In particular, they may have only partial information relating to:

- the specification of the abatement services;
- the cost of delivering abatement services and volume of abatement likely to be delivered under those services;
- the prices other parties may charge for providing similar services or services delivering similar quantities of abatement;
- robust tools to measure the factors that are inputs into the calculation of the quantity abatement achieved; and
- robust auditing tools to ensure claimed abatement did in fact occur.

Parties will learn from each other over time

A feature of the broad industry involvement expected in the ERF is that many potential participants will probably not have a lot of information and knowledge about the market for abatement services, their value and price, and the behaviour of other market participants including the buyer (the Government). It may take some time for industry to fully appreciate the economy-wide market price of carbon abatement and innovate in their own industry to provide competitive, lower cost abatement. Uncertainty about the value of abatement may convince many potential bidders of abatement services that there is little benefit in putting in offers. It is likely that the wide range of industries would benefit from the opportunity to see how the auction and market process for abatement services works in practice. If given this opportunity there would probably be a period of rapid learning from existing and new abatement providers interacting in the market and an improvement in the price and quantity of abatement offered and a reduction in key risks.

Unique factors relevant to the ERF

There will be some factors relevant to the ERF that are less relevant to other auctions. The key ones are discussed below.

Risks

The introduction of the new institutional ERF market mechanism will introduce new risks. While a market for carbon abatement already exists, the introduction of the ERF is likely to presage the development of:

- new carbon abatement services; and
- market dynamics that are currently unknown.

Together with the rapid establishment of the ERF, these present risks to be managed:

- to the Commonwealth, in terms of whether abatement is delivered and in terms of meeting its emissions reduction target; and
- to providers of carbon abatement services, in terms of price and delivery of contracted abatement.

It seems likely that the ERF should be built in such a way as to specifically acknowledge different levels of risk involved in different abatement offers made by industry. This should help those making an offer by applying a price on risk, or raising the value of less risky offers of abatement services. Over time this will assist all of the participants to reduce the risks and uncertainties in their offers of abatement services which will be of material benefit to the Government as the purchaser and the environment where more certain abatement is highly desirable.

Carbon policy may change over the short, medium and long terms

Climate change policy is a contested policy arena and may be subject to significant change over various time scales. The best way to manage the associated risks is to keep the design of the ERF as simple as possible.

3 Auction design

This chapter outlines the key elements of a preferred high level design of the reverse auction mechanism. The reverse auction is the tool the Emissions Reduction Fund will use to determine which tenders offering carbon abatement to accept.

The reverse auction must:

- Allow parties to offer voluntary carbon abatement for purchase by the Commonwealth;
- Rank those tenders according to some criteria and provide a way of transparently selecting which tenders to accept; and
- Transparently identify a market price of carbon abatement to provide information for future potential providers of abatement and to government.

The auction process should also be designed to have minimal administrative costs for both the parties offering carbon abatement and for government.

Preferred auction model

The key elements of our recommended high-level design of the ERF are as follows.

- The ERF would purchase 'abatement services' through recurrent auctions with auction gateways where government makes procurement decisions that occur frequently, possibly quarterly.
- Abatement services would be defined to include:
  - Additional specific activities or new projects that result in abatement; and
  - Changes in existing practices resulting in abatement.
- Abatement would be delivered at any time within an 'abatement delivery period' – the seven financial years following the auction. The offer could also include long-term abatement delivered after the end of the delivery period (e.g. over 25 years) to be discounted to the end of the abatement delivery period;
- Parties would make offers to provide abatement services at any time in the three months before an auction, and could rebid and withdraw an offer at any time up to an auction gateway and offers would be made widely accessible;
- Abatement services would have to be provided through undertaking an *activity* covered by a *methodology.* Methodologies would provide detail about the accounting and verification of abatement. Methodologies might also specify circumstances where activities would not result in genuinely additional or verifiable abatement and so could not be bid into the auction;
- Offers would comprise:
  - total quantities of abatement (in tonnes) at various prices (in $/tonne) for each financial year across the abatement period;
  - Indication of which activities are being provided under a list of preannounced abatement methodologies or a description of the additional activities or changes in existing practices resulting in the abatement;
  - A commitment about which type of offer is being made — Guaranteed or Standard offers — see details in Box 2; and

- If unspecified in the methodology, the conditions that would constitute non-delivery of abatement.

- If government wished, other factors (e.g. environmental benefits and regional community impacts) could be included as part of an offer;
- Abatement offers would be ranked by:
  - the offered price (in $/tonne) adjusted to incorporate the contracting transaction costs faced by government (advantaging offers for larger quantities of abatement); and
  - whether the offer was a guaranteed offer or an standard offer.
- Successful bidders in each auction would be identified by the ERF purchasing the lowest price offers first after taking the following factors into account:
  - Funding – each auction would be allocated a share of the ERF funding for that year;
  - To enhance certainty of abatement delivery, the ERF could:
    - purchase firm quantity offers before other offers;
    - allocate a minimum amount of funding to purchase some firm quantity offers; and/or
    - silo funds to particular industry sectors.
- Other factors (e.g. environmental benefits) could be taken into account through auction tie-breaking rules;
- Each successful tenderer would be paid their bid price;
- Government would pay each successful tenderer the full fee for their provision of abatement services at the time the contract is formed;
- There would be a minimal registration requirement for parties making offers into the auction; and
- Arrangements to meet shortfalls in abatement if they arise would depend upon the type of offer made and the contract that has been formed.
  - For guaranteed offers, bidders would have flexibility to improve performance of their abatement service methodology of up to a year. If shortfalls persisted in guaranteed offer contracts the abatement service provider could acquit the deficit by the purchase of guaranteed abatement offers from other registered parties that have made abatement bids, by the delivery of abatement through abatement services which would be eligible to be bid into the ERF, or by payment of penalties that reflect the prevailing price of abatement.
  - There would be penalties on bidders who had made 'standard offers' where the non-delivery resulted from factors within their control such as shortfalls in the amount of abatement service activity that was in the contract.

Detail about the preferred model appears below and in the rest of this report.

Types of offers that can be bid into ERF auctions

The box below describes the types of offers that could be made into the ERF auction.

Box 2 **Types of offers that can be bid into the ERF auctions**

Guaranteed carbon abatement offer

In the guaranteed abatement offer bidders indicate the amount of abatement they will provide within specific periods of time.

Contracts are formed that state the agreed amount of abatement and the price paid.

If the subsequent validation and verification process reveals that the actual abatement achieved falls short of the contracted amount, the bidder of this type of offer undertakes to provide or procure an amount equivalent to the bid amount at their own expense. Bidders could provide abatement through the provision of abatement services that are eligible to be bid into the ERF even if those services were not part of the original successful offer. Bidders would have a grace period in which to improve the performance of their service to achieve its intended abatement performance or to otherwise resolve the shortfall. This should not exceed one year. Penalties would apply for shortfalls that are not resolved.

In this way the amounts of abatement and prices that are agreed are certain from the perspective of the buyer.

Standard Offer

In this offer bidders provide a specific amount of abatement services activities within a specific period of time. The abatement service activities are drawn from a predetermined 'positive' list of methodologies. Bidders indicate the specific amount of abatement services that they will provide. Bidders also indicate the expected amount of abatement that they expect to achieve (in tonnes) and when. This is derived by multiplying the size of abatement activity offered by a precalculated emissions factor which is published as part of the methodologies list.

Contracts are formed that reflect specify the agreed amount of abatement services and estimated emissions abatement and the price paid.

If the carbon abatement amount is not in fact achieved at the time that contracted amounts are verified and this is due to factors outside the control of bidders, there is no penalty or need for further adjustments. If there is a shortfall in abatement due to a shortfall in the amount of abatement service activity actually performed, the shortfall must be rectified. Within a set period following validation and verification the shortfall in carbon emissions abatement is met through payment of penalties in proportion to the difference in estimated and actual carbon abatement delivered.

Source: ACIL Allen 2013

Auction overview

Governments have used auctions in the purchase and sale of many goods and services including telecommunication spectrum and licences, environmental services (e.g. carbon markets), and the day-to-day goods and services. A reverse auction process was used for the Victorian BushTender scheme and was consulted on in 2012 as part of the then-proposed Non-Kyoto Carbon Fund.[4]

The new Australian Government has indicated that it anticipates using a reverse auction mechanism to purchase abatement through the ERF. In this auction, parties would make offers to government to provide carbon abatement services – where abatement is judged to occur relative to a 'business as usual' world – and government would purchase carbon abatement 'up the cost curve' (i.e. from cheapest to most expensive).

The reverse auction would have the following key functions – it would:

- seek to reveal the efficient cost of the provision of carbon abatement; and
- identify which tenders for the provision of carbon abatement services to accept.

[4] The Australian Government announced in the 2013-14 Budget that the Non-Kyoto Carbon Fund would not proceed because it had expanded land sector coverage under the Kyoto Protocol.

The Australian Government has also indicated that there is to be no preferred source of abatement – it could occur from any industry sector – but it must be domestic in origin and must be a credible source of abatement.

Objectives of the auction design

A key question for the ERF is the nature of the auction. The Minister has indicated that a reverse auction should be used but has left freedom about its further specifications.

The design of an auction must be fit-for-purpose – there is no generic 'one size fits all' for auctions. In designing an auction, it is useful to firstly define its objectives, reflecting the key desired outcomes of the use of the auction.

Given the discussion previously in this report about the circumstances of industry and needs of government, we consider that the objectives of the ERF auction are as follows:

- Procurement of more definite abatement – ensure that sufficient credible abatement that is likely to be delivered is purchased to meet Australia's emissions reductions targets
- Promote price discovery – provide price signals to inform potential providers and stimulate innovation in the carbon abatement market
- Promote allocative efficiency – allocate abatement contracts to those valuing them the most
- Maximise abatement within a fixed funding allocation – abatement is purchased using fixed budget funding
- Contribute towards meeting 2020 targets – ensure there is progress towards Australia's emissions reductions targets
- Minimise transaction costs – minimise the costs to government of contracting with abatement providers and auditing claims of delivered abatement

We consider that the procurement of more certain abatement is a salient factor given the overall policy objective to achieve targeted emissions within a specific period of time and the probability that there is a wide range of abatement services that could be offered with differing degrees of certainty attached.

Other factors

In addition to the auction design objectives, there are a number of factors to take into account when designing an auction, including:

- the government's overriding policy goals;
- the number of parties likely to participate in the auction, and the incentives on them influencing their participation and bidding in the auction;
- the extent to which potential bidders hold private values versus common values for the good/service being purchased/sold; and
- financial factors – governments may seek to maximise revenues or minimise expenditure associated with the sale/purchase of goods/services. Keeping transaction costs to a minimum is likely to be a significant objective.

Key auction design factors

The design of an auction can dramatically impact its success in achieving the desired policy objective.

Four basic types of auctions

In general, there are four basic forms of auction: English, Dutch, first-price sealed-bid, and Vickrey. These are described in the box below.

Box 3 **Four basic types of auctions**

English auctions have the ascending outcry format. The price is successively raised until one bidder remains. The good is sold to the last remaining bidder at a price just above that which sees the second last bidder retire.

Dutch auctions are the reverse of English auctions, with bids announced in a descending order. A bidder wins by being the first to accept an announced bid and pays that price. This design is so named because it has traditionally been used in the Netherlands' flower markets.

First-price sealed-bid auctions require bidders to submit single confidential bids to the seller. The bidder with the highest bid wins and pays that bid.

Vickrey auctions (named after economist William Vickrey) have a second-price sealed-bid format. The bidder making the highest bid wins and pays the next highest bid.

Source: Chan C, Laplagne P, Appels D, *The Role of Auctions in Allocating Public Resources: Staff Research Paper*, Productivity Commission 2003

Detailed design factors

In addition to the basic type of auction, each auction will have a number of detailed design factors including those detailed in the box below.

Box 4 **Detailed auction design features**

The detailed design settings of an auction can affect its success in meeting desired policy objectives. Such settings include:

- who can make bids;
- the minimum information needed to make a bid;
- whether bids are published;
- whether bidders can revise their bid and the number of times they can rebid;
- whether there is a reserve price;
- the tie-breaking rules.

The price paid by/to winning bidders is also a key parameter:

- in a price-discriminating auction, winners pay (or are paid) the bid price;
- in a uniform price auction, all winning parties pay (or are paid) the same price, for example the marginal clearing price; the second-highest bid price; or an average bid price.

Source: ACIL Allen 2013

The industry context

It is anticipated that abatement could be procured from many different sectors as the Australian Government has indicated that the ERF may purchase abatement from any credible source.

With this context, the practical ability of parties in different industry sectors to provide abatement and engage in the ERF is likely to vary dramatically. This is due to differences in the abilities of parties to:

- confidently predict the abatement potential of particular activities and projects or changes in behaviour, and

- measure the actual abatement resulting from those activities and projects or changes in behaviour.

In practice, there is likely to be a degree of uncertainty in a forecast amount of abatement arising from any particular abatement service activity across all of the industries and areas that the ERF is expected to be open to. Some of this variability is because the nature of many abatement activities is such that there may be numerous internal and external (e.g. weather) factors impacting the actual abatement delivered and the contracted party may have limited control over some of these factors.

It is likely that parties in some sectors – e.g. those that can participate in the CFI, the stationary energy sector and the property sector – may have a better understanding of the potential or likely carbon abatement that could arise from projects within their sectors relative to parties in some other sectors. It would be expected that the ability of parties in sectors with a currently limited understanding of the potential carbon abatement would improve over time.

The design of the ERF must be sensitive to the ability of parties across different industry sectors to understand potential carbon abatement and measure the abatement that has actually occurred ex post. This affects the design of the auction mechanism including the information requirements needed.

Key practical factors

A number of additional key practical factors must also be taken into account in the design of the auction:

- the market price of abatement will initially be unknown;
- parties will have decentralised knowledge about the costs of and technology associated with sources of abatement;
- the Australian Government will likely seek to encourage parties to learn and innovate from each other over time in relation to abatement goods and services and price; and
- the offered abatement will have aspects of both private and common values – while each party offering abatement will have its own private value of its offered abatement, the abatement will also have elements of common values as it may have value through other mechanisms.

The box below provides more discussion on ‘private values’ and ‘common values’.

Box 5 **Private and common values**

One factor taken into account in designing auctions is the extent to which bidders are assumed to have private values or common values. Stoneham et al provided the following useful descriptions of private values and common values.

Private values

> 'In a private values model, each agent knows their value with certainty but makes predictions on the values of others.'

Common values

> '…in a common values world, players have identical valuations but they form their estimate of this on the basis of private information. In a common values world, agents will be able to learn about the "common value" of the asset through the bidding strategies of all the other agents (as each agent has private information on the value of the asset). Thus, multiple rounds of bidding can facilitate information aggregation in the market and enable bidders to get a better sense of the true (common) value of the asset. If we are a private values world, such information aggregation does not yield any superior outcomes, as the value an agent places on the asset is private.'

Source: Stoneham, Chaudhri, Ha and Strappazzon, *Auctions for conservation contracts: an empirical examination of Victoria's BushTender Trial*, Victorian Department of Natural Resources and Environment and Melbourne Business School 2002

Key design features and rationale

Frequency of auctions

In general, the choice of how frequently an auction is conducted reflects a judgement about the trade-off between frequency and liquidity as described in the box below.

Box 6 **Trade-off between auction frequency and liquidity**

More frequent auctions enhances price discovery regarding the efficient cost of abatement. It also provides greater opportunities for potential abatement providers to learn from others about practices and prices of potential abatement.

Less frequent auctions results in fewer opportunities for price discovery although it may increase the liquidity of each auction. There would be fewer opportunities for potential abatement providers to learn from others' offers.

Source: ACIL Allen 2013

For the ERF, having fewer auctions would lower the number of opportunities parties would have to learn from each other and decrease the rate at which the dynamics of the market may develop.

Having more auctions would increase the opportunities parties had to bid, to learn from each other and to be awarded contracts. It would also enhance price discovery. However, it would tend to reduce the amount of funding allocated to each auction.

In addition, an optimal frequency of auctions may reflect aspects to which participants have 'private values' versus 'common values' of their offered abatement services – economists suggest that it may be appropriate to use:

- a single-bid auction where the bidders hold private values for the items being auctioned; and
- multiple auction rounds where there are common values for the goods/services.

Experience from real world auctions suggests that a reasonable compromise can be struck between a single auction and more frequent actions. The sale of Treasury Bonds is conducted through an auction that involves a tender for larger amounts of money than those being considered in Direct Action.

While it is clear that private parties are likely to know the private value that they place on government debt and holding Treasury Bonds with precision the Government does not seek to raise all of annual funding requirement in a single tender or auction. It runs a program of Bond tenders over each year. Spreading the tenders out gives Government the ability to test if it is in fact obtaining the market price when it issues Treasury Bonds. It is likely that having a frequency that is greater than a single tender (or auction) provides the market with an opportunity to discover prices and improve their prices in subsequent auctions – although it is noted that the market provides price information in any case through the secondary market trade in the bonds that are already in circulation.

We suggest that a reasonable trade-off would be to have more than one auction in a year and possibly to run up to four auctions in a year (that is quarterly actions). This would provide price discovery regarding the efficient cost of abatement and learning by potential providers of abatement of others' abatement activities and costs.

It would also provide bidders multiple opportunities each year to be contracted in auctions to which material amounts of funding are allocated.

It also appears that having quarterly auctions would be consistent with a judgement that bidders are likely to have a mixture of 'private values' and 'common values' in respect of the value of their offered abatement.

Having quarterly auctions would result in material amounts of funding being allocated to each auction. While the precise amounts of funding allocated to each auction could be determined by government and communicated to the market before each auction, they might be of the order of:

- about $75 million for each of the four auctions in the first year of the ERF;
- about $125 million for each of the four auctions in the second year of the ERF; and
- about $187 million for each of the four auctions in the third year of the ERF.

It would be expected that any funding not expended in one auction might be allocated to the next auction.

Structure of auction offers

Offers into the ERF to provide abatement services should have to contain a minimum set of information to be valid.

Simplest offer structure

The simplest type of offer would include the following minimum information:

- The party making the bid (and any other parties the bid is being made on behalf of);
- The abatement services being offered that will lead to abatement (this could comprise multiple activities within one sector or across several sectors);
- The quantity of abatement offered in each financial year (in tonnes) at each offered price – this represents the estimate of abatement volume that will be achieved;
- The offered price(s) of abatement (expressed in $/tonnes);
- If unspecified in the relevant methodology (which would only be expected in special circumstances), the conditions that constitute non-delivery of abatement;
- Whether the offer is a 'guaranteed offer' or a 'standard offer'; and
- Indication that the offer accepts the rule of the auction and other arrangements.

A 'guaranteed offer' is an offer where the party making the offer confirms they will purchase or otherwise deliver any abatement they are contracted to deliver but do not deliver (for any reason – whether for external or internal reasons). These offers would be considered to provide greater certainty of delivery relative to 'standard offers'.

A 'standard offer' is one that commits the bidder to provide abatement services methodologies. The methodologies are predetermined lists of activities that have expected or deemed abatement potential. Bidders are accountable for the achievement of the amount of activity that was bid and accepted by the Government and included a contract. If the bidder subsequently provides less abatement service activity than has been included in the contract (where they alter only a portion of a building or in the case of agriculture provide less reafforestation than offered) they will be subject to penalties. The penalties would be calculated in terms of the amount and value of the estimated shortfall in abatement that was not provided.

There would be a floor price of $0/t for abatement. A ceiling price of $500/Mt CO2-e would apply to avoid absurd prices being entered and reducing the scope for strategic game playing in the auction. Bid prices would have the format of dollars and cents per tonne – there is limited value in bid prices having a greater level of precision.

The total amount of money paid for abatement would be capped at the total allocation to that auction.

It is necessary for there to be a bid quantity threshold to avoid large transaction costs for the Commonwealth arising from numerous bids offering very small amounts of abatement. While the level of the threshold might be determined through the policy development phase, we suggest that the threshold could be 200 tonnes per year.

As discussed later in this report, parties could act as aggregators. One function of aggregators would be to aggregate small bids into biddable offers. Aggregators may also be able to group together a large number of standard offers and then make their own 'guaranteed offer' which should be more attractive to government.

Multiple offers

A party could make more than one abatement offer into any auction. Each offer would be treated as a separate offer in the auction.

Timeframes for making offers and rebidding

Making offers

Parties would make offers to an auction at any time after the previous auction. The prices in such offers would be firm but parties could rebid at any time up to a gateway time before the auction (e.g. a day before). Allowing rebids is consistent with a key objective of this auction being to enhance price discovery, innovation and competition in the market for carbon abatement.

Auction

The ERF would conduct the auction at the designated time on the basis of the offers as they stand at the time the gateway closes.

Post auction

After each auction, bidders could keep their unsuccessful offers live for the next auction or withdraw them at their discretion.

Offer prices and quantities

While it is not possible for parties to bid in completely firm volumes of abatement, it is necessary for offered prices to be firm.

An offer would contain ascending quantities of abatement at ascending prices. The following schedule of quantities and prices provides a simplified example of the quantities and prices that might be provided in a single offer:

- 50,000 tonnes at $20/tonne;
- 250,000 tonnes at $25/tonne;
- 300,000 tonnes at $50/tonne.

It should be noted that in this indicative example, a total of 300,000 tonnes of abatement is bid – not 600,000 tonnes.

A bidder could also submit multiple abatement offers (e.g. corresponding to different projects). Each offer would be treated separately in the auction process.

Eligibility to bid into the auction

In principle, any responsible person or legal entity should be able to make a bid to offer abatement into the ERF.

However, the effectiveness of the ERF will rely on there being credible bidders who make accurate and verifiable bids. Many auctions seek to address this by requiring all bidders to have gone through a pre-approval process. This type of process aims to ensure they meet minimum requirements needed to participate in the auction.

Also in principle, the registration requirements for any particular party could be related to the risk of that party not delivering contracted abatement. However, the risk of non-delivery can be addressed in other ways.

Bidder registration

In the Carbon Farming Initiative (CFI), all applicants must be recognised as 'Recognised Offsets Entities' (ROEs) before they can participate in the CFI. A Recognised Offset Entity can be an individual, body corporate, a trustee, a corporation sole, a body politic or a local governing body and must pass a 'fit and proper' person test.

The purpose of the 'fit and proper' person test is to protect the integrity of the CFI by examining whether the applicant is who they claim to be and whether they have been convicted of dishonest conduct potentially relevant to the CFI as well as matters such as insolvency.

A similar process could be adopted for the ERF to maximise opportunities to purchase abatement while ensuring confidence in the bidding process. A party could be required to be a 'Recognised Abatement Entity' (RAE) before they participate in the ERF. This would involve a similar qualification, verification and checking process as for the process for parties to become ROEs. The registration requirements should be reviewed to ensure that they are truly minimal.

It would also be useful to allow RAEs to appoint other RAEs as their agent(s) in the auction process. RAEs would include, as a sub-set, 'Aggregator RAEs', which coordinate and aggregate abatement activities undertaken by a range of parties. The need for Aggregator RAEs are discussed further in section 4, but in principle should be able to bid into the auction equivalently to other RAEs.

The abatement delivery timeframe for each auction

In each auction the cap on overall expenditure would apply only in relation to offers accepted in that auction regardless of the year the abatement is actually delivered.

In each auction, parties should be able to offer abatement over an 'abatement delivery period' (e.g. seven financial years) after the auction is held. This means that at the end of the first auction's abatement delivery period there may be abatement being delivered from contracts awarded during later auctions.

In addition, to take account of long-term abatement (e.g. over 25 years) being provided beyond the end of the abatement delivery period, it should be able to be included in the offer but discounted at some rate to the end of the abatement delivery period.

How non-firmness in abatement delivery is addressed

While the government's intent is to pay for abatement that is actually delivered and to apply binding contracts, as discussed previously, it will be impractical for most businesses to know in advance precisely how much abatement they will realise from their abatement services and methodologies. Designs and business methodologies will be influenced by a raft of factors some within the control of bidders and some outside of their control. It will therefore be necessary to deal with different levels of certainty.

A reasonable model to take into account is that most abatement service methodologies will involve an expected level of abatement volume, noting that actual volumes will vary in ex-post assessment and validation. This would be reflected and specified in specified in the relevant methodology.

For 'guaranteed' offers, the bidder will take the risk of non-delivery and must purchase or otherwise deliver abatement to make up any shortfall in the delivery of their contracted abatement. All else being equal, the government should select these offers ahead of others because they are more certain.

For 'standard' offers, the requirement is to meet the amount of abatement services activity that was contracted and the government takes risk of non-delivery or shortfalls in delivery only where this is out of the control of bidders – variations due to changes in methodology formulae for example will not incur penalties. All else being equal it is expected that the government would give these offers lower priority when accepting bids.

In general non-delivery would incur a penalty, at a pre-determined rate. The risk of incurring penalties for failing to deliver a bid volume of abatement will be incorporated in bid prices, and will affect bid volumes (as a risk management response).

Standard basis to compare offers

There will need to be a standard basis to compare abatement offers when making decisions about which offer to accept. This is because there are likely to be numerous sources of carbon abatement offered into the auction over time – possibly including from the renewable electricity, stationary energy, land sector, and energy efficiency sectors.

How to identify successful offers

Both price and certainty of delivery should be used to award tenders. This is because:

- price is a key consideration to ensure abatement is purchased efficiently and to promote innovation and competition in the carbon abatement market; and
- it is important for the Commonwealth to have confidence that there is a strong likelihood that contracted abatement will be delivered.

Successful offers should be identified using a lowest price principle subject to a certainty principle. Any other factors (e.g. holistic environmental benefits, indoor air quality, water and innovation as well as regional community development) should only be incorporated into the assessment of offers through tie-breaking rules.

Minimising the transaction costs to government is a key ERF design objective. This is addressed in the lowest price principle.

Lowest price principle

The *lowest price principle* is that lower priced offers (in $/tonnes of abatement) should be accepted before higher price offers. We consider that, apart from the *certainty principle* discussed in the next subsection, non-price factors (e.g. other environmental benefits) should only be taken into account through tie-breaking rules. Taking them directly into account in assessing tenders would lead to greater opaqueness in the auction process as discussed in the box below.

Box 7 **Price and non-price factors**

Price is the main criteria used to award tenders in many auctions, while additional criteria (e.g. experience, anticipated quality of services, risk of non-delivery, and additional services) are often used in tender processes relating to more complex services and assets. These additional criteria tend to fall into two categories: (i) they are related to the delivery of the specified good/service; and (ii) they are related to delivery of other goods/services.

Price should be a key consideration in the ERF auction as the key desired outcome is the purchase of the abatement 'up the cost curve' to meet Australia's net emission reduction target – that is, at least cost. However, it may be appropriate for other factors to be taken into account if abatement activities have other impacts that government considers important (e.g. environmental impacts and regional community impacts).

Taking other factors – e.g. environment impacts – into account would make the ERF more complicated and possibly reduce transparency by introducing human judgement into the tender ranking process. This is because tenders would be ranked on a combination of price and subjective judgement. We recommend against using a multi-criterion approach to assessing tenders as doing so could reduce market confidence in the ERF and also make it challenging to ascertain a market price for carbon abatement.

The simplest approach is to take any other factors into account through auction tie-breaking rules.

Source: ACIL Allen 2013

Minimising transaction costs

It will be important to government to minimise the transaction costs associated with the contracting of and delivery of abatement services. A straightforward way of doing this in the ERF is encourage bidders to make offers of larger amounts of abatement.

A reasonable way of doing this is to calculate a *shadow price* for each bid that incorporates the average transaction costs to government associated with abatement services averaged over the quantity of abatement offered in that bid.

This advantages bids offering larger quantities of abatement as offers would be compared on the basis of their shadow prices rather than their offer prices.

We consider that the transaction costs are likely to include the costs of negotiating an abatement services contract, auditing claims of abatement delivery, and administering the contract.

The box below details how shadow prices would be calculated.

Box 8 **Calculating shadow prices**

The *bid shadow price* would be expressed in $/tonne. It would be calculated using the following formula.

$$\text{bid shadow price} = \text{bid offer price} + \text{bid transaction price}$$

The *bid transaction price* equals the average contract transaction cost to government divided by the total quantity of abatement (in tonnes) offered in a bid.

Source: ACIL Allen 2013

Certainty principle

The *certainty principle* is that government will purchase some abatement through each auction for which there is a greater certainty of abatement delivery. The need for this certainty principle arises from gaps in the information held by the government and abatement providers about the certainty of abatement delivery.

The precise design of the certainty principle will be a decision for the government. Four options to implement the certainty principle are as follows.

Option 1 – ERF purchases 'guaranteed offers' before other offers

One option is for the ERF to accept offers from among the guaranteed offers before accepting any other offers. The aim of this option would be to increase the Commonwealth's confidence that the contracted abatement will be delivered.

One potential drawback for this option is that it might tend to result in a lower total volume of abatement being purchased as it is likely that there are relatively fewer bidders able to make guaranteed offers and higher levels of certainty are likely to be more expensive resulting in less emissions abatement being purchased given a fixed amount of funding.

Option 2 – Government silos some funds for guaranteed offers

Another option is to silo some auction funding for guaranteed offers. This would ensure that a minimum amount of funding is allocated to such offers.

Option 3 – Government silos funds by industry sector

An additional option is that government could decide to allocate minimum amounts of funding to offers relating to particular industry sectors for each auction. This could be done by defining particular industry sector categories together with an 'other' category and allocating some funding to each category.

The entire funding for an auction could be allocated to those categories for each auction. Alternatively, a portion of the total funding could be allocated to categories and the remainder allocated to the auction generally.

To enhance transparency, government should publish details of any industry sector categorisations and the amounts of funding allocated to each category before any auction.

Option 4 – Purchase 'guaranteed offers' first and silo remaining funds by sector

A further option is that government could use a mixture of options 1 and 3 by purchasing 'guaranteed offers' before other offers and splitting the remaining funds between predefined industry sectors.

To enhance transparency, government should publish details of any industry sector categories and the percentages of funding allocated to each category before any auction.

This option would combine the advantages of enhancing the certainty of abatement delivery through purchasing 'guaranteed offers' and allocating funds across a number of sectors.

Process for identifying successful offers

Each bidder would make an offer to the auction to abate carbon emissions for a period of up to seven financial years after the auction (or longer for long-term abatement). A party could offer to abate carbon emissions in one or more of the financial years, and could offer different quantities of abatement (in tonnes) each year.

All bids into the auction would be ranked by a *shadow price* (in $/tonnes of abatement). The shadow price for a bid is set equal to the *bid offer price* plus a *bid transaction price* calculated as per box 8 above.

- The transaction price for a bid is calculated by dividing the *average contract transaction cost* by the total quantity of abatement in tonnes offered in that bid.
- The *average contract transaction cost* is determined by taking the average of the historical costs to government of negotiating an abatement services contract, auditing claims of abatement delivery, and administering the contract.
- For the initial auctions, the ERF would use an estimate of the contract transaction cost.
- An indicative example is as follows:
  - a bidder makes an offer of 100,000 tonnes of abatement at $30/tonne
  - the average contract transaction cost is taken to be $25,000
  - the transaction price for that bid is calculated to be $0.25/tonne (equal to $25,000 divided by 100,000 tonnes)
  - the shadow price for this bid would be $30.25/tonne (equal to $30/tonne + $0.25/tonne)

Subject to the certainty principle, the lowest shadow price bids would be accepted first, with offers accepted until the total funding available for purchasing abatement in that auction is notionally allocated to successful bidders.

For simplicity, offers would be considered in relation to abatement occurring anytime within the seven year period. This is the most straightforward approach as some activities may result in abatement over a number of years.

The Australian Government has indicated that a capped level of funding will be available for the ERF in each financial year.

The Commonwealth would reserve the right to not accept any offers if insufficient offers were received. The government would determine the threshold before the auction. The threshold should not be published to reduce the risk of collusion between bidders.

Abatement and cost target for each auction

The government has indicated that it will allocate a maximum annual amount of funding for the purchase of abatement through the ERF.

Having an annual capped amount of funding creates an implicit abatement cap in which the level of the abatement cap depends on the prices offered and abatement quantities offered. The Australian Government may seek to achieve an 'abatement path' to achieving the five per cent net emissions reduction target by varying the total annual funding for the purchase of abatement. It may also seek to cap the abatement for each auction period if it considers that the five per cent net emissions reduction target is highly likely to be met with a given funding cap.

It follows that it may be appropriate for government to set out an abatement path and reconcile verified abatement against the abatement path on a year-on-year basis if it appears likely that there is a material risk that the 2020 emissions reduction target will not be met. Government could establish an abatement target for any particular year and direct that the sum of the expected currently contracted abatement and abatement to be purchased through auction in that year would have to meet that target.

Price to be paid to successful bidders

A key element of any auction design is the price that is paid to successful tenderers. Different approaches to paying successful tenderers will create different incentives for bidders in making offers to the auction.

It would be expected that each auction participant would make an offer into the auction at a price no less than the cost to that party of providing that abatement. Given this:

- Paying parties the average bid price may result in parties under-recovering the costs of providing the abatement. Parties may not make offers in the auction if they consider they might under-recover the costs of providing the abatement.
- Paying all successful tenderers their offer prices may create incentives for auction bidders to engage in bidding strategies that maximise their revenues while still being successful in the auction. It would also tend to result in greater volumes of abatement being purchased through the auction.
- Paying all successful tenderers the marginal clearing price may reduce the incentives for parties to engage in strategic bidding relative to paying each party their offer price but would decrease the volume of abatement purchased for a fixed amount of funding.

Paying all successful tenderers their bid price the most straightforward approach to paying successful tenderers and would maximise the volume of abatement purchased. Successful tenderers would be paid their *bid price* and not the associated shadow price.

The timing of payments is discussed in Chapter 4.

An example of how the 'pay as bid' arrangements function is provided in the box below.

Box 9 **Indicative example – pay as bid**

A party makes the following single offer of abatement services into the ERF:

- 50,000 tonnes at $20/tonne;
- 250,000 tonnes at $25/tonne;
- 300,000 tonnes at $50/tonne.

The average contract transaction cost is taken to be $25,000. This results in the following shadow prices used in determining the successful tenderers:

- 50,000 tonnes at $20.50/tonne;
- 250,000 tonnes at $25.10/tonne;
- 300,000 tonnes at $50.08/tonne.

The marginal clearing price was $27/tonne and this party was contracted to provide abatement services.

Under this party's contract, they are to supply 250,000 tonnes of abatement at $25/tonne.

Source: ACIL Allen 2013

Contracting with successful bidders

The Commonwealth would contract with the successful bidders. Each such bidder would then be responsible for the delivery of the abatement over the seven years as specified in their offer or are otherwise agreed with the Commonwealth.

The contract would likely cover the following matters:

- Price for the delivery of abatement;
- Quantity of abatement to be delivered;
- Timing of delivery of abatement;
- Validation;
- Reporting and payment schedule;
- Adjustments – in accordance with the relevant methodology; and
- Novation.

Contracts must be binding

Contracts for the provision of abatement services must be binding on both government and the successful tenderer. This is to provide both parties with certainty regarding the:

- abatement services the successful tenderer is to provide to government; and
- payments the government are to provide the successful tenderer.

Such certainty is needed to enhance confidence that abatement services will be delivered and that relevant payments will be made to successful tenderers (allowing them to recover the costs of providing those services). Parties may have reduced incentives to offer abatement services into the ERF without such certainty.

Other matters

How revenues from the ERF are treated for taxation purposes

The abatement services that are going to be subject to a contract under the ERF are likely to be viewed as income received by the successful bidder. As such, this income would be subject to the same taxation provisions as would be applicable to other sources of income.

This would be similar to the treatment of coupon payments from Treasury bonds and other services provided under contract to government.

In the property sector, a significant proportion of bids are likely to be made from A-REITs (Australian Real Estate Investment Trusts). A-REITs own or manage a significant proportion of non-residential buildings throughout Australia, especially larger scale offices and shopping centres.

A-REITs are constrained in that they are supposed to only obtain gross income from passive rental income. Government would need to provide clarity to ensure that the income received by A-RETIs through the ERF for abatement services would be akin to passive rental income.

Price transparency

One reason to have an auction process is to encourage price discovery regarding the cost of abatement. Closely coupled with this is price transparency to ensure that parties can make decisions about whether to offer carbon abatement into the ERF, to inform their bidding strategies, and to inform government and the wider community about the market price of abatement.

To assist with price transparency, it would be useful to release information about the auction offers and the clearing price after each auction. This would also assist government in understanding how much funding is required to meet the emission reduction target.

Organisation conducting the auction

Government would make decisions about which organisation would conduct the auction.

4 Developing and applying abatement methodologies

This chapter discusses how the Government will recognise abatement that parties may bid into the reverse auction. The essential components of this process of recognising abatement are:

- Developing and approving formal methodologies that estimate how much abatement particular activities will lead to under particular circumstances
- Measuring and reporting on abatement activities to support payment under the ERF
- Independent verification and/or auditing of abatement activities to ensure that payments under the ERF are justified.

The recognition of abatement interacts with the design of the reverse auction to select parties to provide abatement in a range of ways. Particularly, the stringency of methodologies by which abatement is recognised will affect the price and volume of bids to the auction. Similarly, the stringency and costs associated with measurement, reporting, verification and auditing, and any penalties associated with non-delivery of abatement, will affect bid volumes and prices. Finally, methodologies and auction mechanisms must address issues around the timing over which abatement is delivered, and clarify the rights and responsibilities of parties associated with the delivery of abatement.

Development and approval of methodologies

Identifying activities

Conceptually, a vast range of actions by businesses and individuals could lead to reduced emissions relative to alternative courses of action. However, purchasing abatement that is genuinely 'additional' requires, in theory, identifying what would have occurred in the absence of the financial incentive to achieve abatement, estimating the emissions associated with those 'business-as-usual' (BAU) actions, and estimating the change in emissions that result. In practice, this is extremely difficult due to the range of factors that might influence both business-as-usual actions and actions specifically designed to achieve abatement.

Purchasing abatement is therefore based on a stylised set of actions known as an activity. An activity is usually explicitly defined by reference to a specific action or set of actions that can reasonably be expected to reduce emissions, but these activities also generally implicitly assume what set of actions which are expected to occur under business-as-usual. Some examples of activities, described by reference to both their explicit and implicit (BAU) actions are set out in Table 1.

Table 1 **Examples of abatement activities**

Activity	Scheme	Explicit actions	Implicit BAU actions
Capture of piggery methane	CFI	Operation of an anaerobic lagoon to store and treat piggery waste; capturing and combusting biogas (methane) from lagoon	Untreated storage of piggery waste resulting in methane release to the atmosphere
Capturing of methane from legacy landfill waste facilities	CFI	Capturing and combusting of methane from closed landfill facilities	Ongoing decomposition of legacy landfill waste resulting in venting of methane to the atmosphere
Native plantings	CFI	Establishing by direct seeding or planting, planting of at least 2 metres in height and covering at least 20 per cent of land with crown cover.	Land remaining in various unforested uses including grazing and cropping
Replacing electric water heater with gas water heater	VEET, REES	Installing a new gas water heater when an existing electric water heater reaches end of operating life	'Like-for-like' installation of replacement electric water heater
Replace household cooling system	REES	Installing a 3 star or higher reverse-cycle air-conditioner	Ongoing operation of a market average (approx. 2.2 star) efficiency air-conditioner

Source: CFI methodologies, EnergyConsult paper *Investigation of deemed savings for residential activities in a possible National Energy Savings Initiative*.

Potential examples of abatement services in the property sector

Concrete examples of potential abatement services that could be provided in the property sector are as follows.

- An office building owner changes their grid-supplied electricity retail contract to 100 per cent Greenpower
- A warehouse owner installs solar photovoltaic cells on the warehouse rooftop to partially offset the consumption of grid-supplied electricity
- A hotel chain increases the energy efficiency of its hotels by installing window glazing and efficient light bulbs.
- Components of the heating, ventilation and air conditioning system of a shopping centre are rebuilt
- An existing office building is retrofitted to become more energy efficient or is replaced with a comparable building that is more energy efficient
- A residential unit complex installs more efficient air conditioning systems.

The quantities of abatement arising from these abatement services may vary dramatically.

Relating activities and methodologies

Each activity must have a specific methodology. An activity may apply to a relatively broad or narrow range of actions, with the distinction between activities being ultimately driven by practical matters of describing actions and activities in sufficiently standardised way to capture the specifics of a range of circumstances, whilst remaining of general applicability.

For example, an activity might be described as 'replace existing household heating or cooling system' but be defined with sufficient detail to capture a range of different circumstances in terms of the model of the existing and replacement models, the likely intensity of usage of the systems and other relevant factors. Alternatively, replacement of heating and cooling systems might be separated into two distinct methodologies due to differences between the two activities, such as the fact that one might replace an electric heater with a gas heater, whereas that is much less likely in the case of cooling.

A menu of 'deemed' activities could be defined where each deemed activity is covered by a methodology and the associated quantity of abatement (or similar measure such as percentage reduction in energy use) is completely or substantially pre-determined. The existence of a set of 'deemed activities' would enhance the ability of parties to provide abatement services as they would have greater certainty about the amounts of abatement they would deliver.

The concept of 'activity-specific' methodologies is consistent with arrangements under the CFI where a 'positive list' of activities has been identified. The CFI 'positive list' activities are those that are deemed to pass a key 'additionality' test and go beyond common practice in the relevant industry or environment. Anyone can propose activities for the 'positive list', with submissions undergoing an administrative process for approval.

A key element of defining the methodologies for the purposes of the ERF is that they should be defined in a way that is measurable. That is, activities have to be established that can be linked to changes in the level of business activity in everyday quantums. For example, in changes in heating and cooling technologies the magnitude of the change in business activity would be related to size of the premises where the changes are being made. Equally, when looking at sequestration through changes in forestry or land clearing, many obvious measurement approaches would relate to the change in the size of forested area.

Process for developing and approving methodologies

Under the CFI, methodologies are developed administratively under the guidance of the Domestic Offsets Integrity Committee (DOIC) and then approved and formalised as a legislative determination. As for any legislative instrument, Parliament can disallow CFI methodologies.

Minister Hunt's Sydney Institute speech suggested that the CER would approve methodologies. However, this does not represent current practice under the CFI. At present, the CER monitors compliance with methodologies, but the relevant Minister approves methodologies (on advice from DOIC). Either approach could potentially be functional, as it would be possible for Parliament to delegate to the CER the ability to make methodologies in the form of an administrative guideline. Alternatively, it may be that the complex policy choices around additionality and other aspects of any individual methodology means that the process of developing and approving methodologies remains with the Government (the Department of the Environment) as a core policy task, potentially with input from a specific expert committee or committees like the DOIC.

In either case, we anticipate that a set of methodologies will be pre-determined under a formal legislative framework. Whilst methodology development and approval essentially remains a core policy task of government, there is still significant room for industry involvement. For example, the government would likely respond to industry representations on the likely volume of abatement to occur through specific activities when prioritising which methodologies to develop. It will not be straightforward to codify clear and robust methodologies for all potential variants of abatement activities across a broad range of sectors. The government would be likely to prioritise resources towards formalising the most promising activities. Given this, potential methodologies should be able to be suggested to the Government or any relevant expert committee at any time.

Principles for approving methodologies

The Australian Government has indicated that the ERF is to be source neutral and that all abatement purchased is to be domestic in origin. In principle, all activities that offer credible abatement that satisfies additionality rules should be able to be offered into the auction.

It will be important to ensure that abatement purchased by the ERF is real and additional and incorporates safeguards against adverse impacts. The CFI's integrity standards, which could be adapted for the ERF, are described in the box below.

Box 10 **Carbon Farming Initiative integrity standards**

- Measurement – each CFI project must use an approved CFI methodology to ensure that abatement is measurable and verifiable. CFI methodologies are supported by peer reviewed science and assessed by an independent expert committee (the Domestic Offsets Integrity Committee);
- Additionality – abatement must go beyond legal requirements and common practice within a comparable industry and/or region;
- Leakage – measurement methods must account for leakage and variability and use conservative assumptions;
- Permanent – sequestration from establishing trees or building soil carbon must be permanent.

Source: Australian Government, *Non-Kyoto Carbon Fund: Discussion Paper*, November 2012

The ERF would rely on similar principles in developing and approving methodologies. The permanence criterion is not necessarily of broad application, and is most relevant where activities are deemed up-front on the assumption of essentially permanent changes such as tree planting or changes to soil carbon content. However, the other principles remain relevant to the ERF as explained below:

- Measurement – each abatement offer into the ERF must comprise projects that use an approved ERF methodology to ensure that abatement is measurable and verifiable. ERF methodologies would specify measurement, verification and auditing requirements which would need to be complied with.
- Additionality – ERF methodologies should take into account assumed BAU actions in determining how much abatement to credit for specific activities. BAU actions will be determined by a range of economic and technical considerations, which are likely to be broader than the CFI's relatively simple conception of 'going beyond common practice'. Where BAU actions are constrained by other regulations this will need to be taken into account.
- Leakage – ERF methodologies will need to take into account 'second order' effects that arise from specific actions. For example, closing down a highly-emitting power station would require that the lost output be replaced from alternative sources, which would entail some level of emissions. The abatement from shutting down a power station is not, therefore, the change in emissions at that power station, but the net reduction in emissions taking into account the 'leakage' of emissions from the shutting power station to other power stations.

An additional principle clearly established in the Government's statements to date, and consistent with the CFI, is that abatement under the ERF must be domestic in nature, that is, it must occur within one or more Australian States or Territories (excluding the Australian Antarctic Territory) and/or within Australian territorial waters.

Issues around measuring, reporting, verifying and auditing emissions reductions in accordance with any specific methodology are discussed further below.

It is not possible to express a general additionality test for the ERF. The additionality of abatement activities in many sectors require assessments of dynamic and complex market interactions that affect both business as usual and abatement activities.

For example, in areas of energy efficiency, transport, coal mine methane, landfill gas and electricity generation, production of the service being provided and abatement will be affected by a range of technology, fuel price, and capital cost factors that are specific to each facility. In many cases the benchmark of common practice is not meaningful because each facility is tailored to meet its expected circumstances. Therefore, the assessment of additionality will require judgement in relation to each specific methodology as to the market circumstances that affect what actions would be likely to occur in the absence of the ERF incentives.

What methodologies may be approved

The list of methodologies under the CFI was limited in part due to the fact that offsets cannot be issued with respect to actions in covered sectors. Under the ERF, the removal of direct coverage also allows expansion of methodologies to a range of new activities. These activities will extend into a range of sectors, e.g. building sector, and embrace new clusters of activity types, e.g. energy efficiency.

The expansion of the range of methodologies in new sectors can draw on a range of precedents and work done elsewhere. Potentially, recognised energy efficiency actions established under state-based 'white certificate' schemes (i.e. VEET in Victoria, REES in SA, ESS in NSW) could be incorporated into the ERF. However, this raises issues of additionality in those states (see below).

Further, broader energy efficiency actions could be considered. In the case of the property sector, baselining of energy use per unit area based on building code requirements on a general basis could be incorporated in a methodology that then credits designs assessed to deliver improvements on that baseline.

Methodologies for waste coal mine methane and landfill gas could be developed from the old crediting mechanisms under GGAS.

Other methodologies could include a generic description of an efficiency enhancement at a specific project. This would presumably require an engineering assessment of the current efficiency of the plant and the likely future efficiency of that plant. Such methodologies would also need to take into account whether the upgrade would change the output volume of the plant.

It is likely, however, that broad methodologies (e.g. describing efficiency enhancing upgrades of a plant) will require a range of engineering and market analyses that themselves will be project-specific and which may not be able to be pre-specified in terms of their content and approach to a large degree. This will inevitably impose some cost on the Government in terms of assessing and undertaking due diligence on these projects.

Interaction with existing policies

A key question for industry is whether activities they are undertaking under existing schemes will be able to be bid into the ERF. There are a large number of existing schemes relating to energy efficiency and climate change policies that parties may be undertaking activities under, including the:

- Energy Efficiency Opportunities Program;
- National Solar Schools Program;
- Charities Maritime and Aviation Support Program;
- Community Energy Efficiency Program;
- Energy Efficiency Information Grants Program;

- Local Government Energy Efficiency Program;
- Low Income Energy Efficiency Program;
- Renewable Energy Bonus Scheme;
- Solar Hot Water Rebate Programs;
- Heating, Ventilation and Air-condition High Efficiency Systems Strategy;
- Renewable Energy Target (RET);
- NSW Energy Savings Scheme (ESS);
- Victorian Energy Efficiency Scheme (VEET); and
- South Australian Residential Energy Efficiency Scheme (REES).

While some of these schemes have now closed or stopped recruiting new projects, some activities or projects that were assisted under them may still be in operation.

In general, these schemes were not primarily focussed on creating carbon abatement. As such, parties participating in such schemes should be able to include any incidental abatement services that they may obtain under them in an ERF bid provided that the abatement delivered was *additional*. Where participation in these schemes is voluntary and they do contribute to further emissions abatement that abatement is clearly additional to 'business as usual'.

There is a question about whether allowing abatement services activities bid into the ERF to include those activities that had already obtained the benefit of some of the above incentives provided by other levels of government is 'double dipping' and should be prohibited. It is not clear that this would represent 'double dipping' because most of the schemes listed above provide only partial assistance. Generally, the provider has made or has to make a still significant co-contribution to correct the externality (or the public good in some case) which is being purchased by the scheme. Similarly, it is unlikely that the ERF will fully cover the costs of bringing about the desired investment into new technologies or practices that bring about abatement. So, the possibility of there being two public partial contributions to the correction of an externality is not likely to provide a windfall gain to providers rather it will reduce the underlying cost disadvantage still inherent in the provision of abatement.

It should be noted that new projects or changed practices occurring as a consequence of a legislative obligation would not be eligible to be bid in to the ERF as they are not voluntary abatement activities and would occur in any case with the ERF (that is, they are not additional the business as usual scenario).

It may be convenient to place a list of activities and changed activities and practices that were not eligible to be bid into the ERF on a *negative list*.

Where there is any doubt about whether an abatement activity is additional to that occurring under some other scheme, that doubt should be addressed in documentation supporting the specific bid.

Interaction of the ERF with the RET

An example of the interaction of the ERF with existing schemes is shown by its interaction with the RET. A high-level principle of the ERF is that abatement services that result in additional abatement would be eligible to be bid into the auction. This would include additional abatement underpinning the production of:

- Large-scale Generation Certificates (LGCs) under the Large-scale Renewable Energy Target (LRET); and

- Small Scale Technology Certificates (STCs) under the Small-scale Renewable Energy Scheme (SRES).

In principle, the production and/or purchase of LGCs and STCs could be taken to be 'abatement services' for the purposes of bidding into the ERF provided that the LGCs and STCs were associated with the production of additional abatement and the amount of such abatement could be verified. There may be complexities associated with calculating and verifying the abatement associated with the production of any already-existing LGC or STC.

The box below discusses some of the issues associated with using LGCs and STCs.

Box 11 **Use of LGCs and STCs for the ERF**

Large-scale Generation Certificates (LGCs)

One LGC is equivalent to 1 MWh of eligible renewable electricity.

LGCs would be eligible to be bid into the ERF provided that the abatement associated with the production of that LGC was known and could be verified.

A methodology would likely determine the quantity of abatement associated with an LGC. One potential approach may be to calculate the carbon intensity of the grid-supplied electricity in the relevant year for the relevant state/territory, however this may be inappropriate for state/territories in which the production of LGCs is associated with material change in the carbon intensity of the grid-supplied electricity.

Given the complexity associated with determining the abatement associated with any particular already-existing LGC, one approach may be for ERF bidders to contract with providers of newly generated LGCs.

Small Scale Technology Certificates (STCs)

One STC is equivalent to 1 MWh of renewable electricity generated by 'eligible small-scale systems (small-scale solar photovoltaic cells, small wind turbines and micro hydroelectric systems and solar water heaters).

The number of certificates a system can create is based on the amount of electricity in MWh:

- Generated by the solar PV, wind or hydro system over the course of its lifetime of up to 15 years; or
- Displaced by the solar water heater or heat pump over the course of its lifetime of up to 10 years.

The total number of STCs for a given system may vary according to geographical location, the type of system installed, eligibility for the Solar Credits multiplier, and the size and capacity of the installed system.

A methodology would likely determine the quantity of abatement associated with an STC. Given the complexity associated with determining the abatement associated with any particular already-existing STC, one approach may be for ERF bidders to contract with providers of newly generated STCs.

Source: Clean Energy Regulator, ACIL Allen 2013

Case studies – the property sector

The boxes below outline a number of potential approaches to methodologies that could be applied in relation to the property sector. These provide concrete outlines of how abatement could be calculated.

Box 12 **Example 1 – Improve energy efficiency in an existing building**

Description of activity/changed behaviour:

Increase the NABERS Energy star rating, or improve the Greenhouse Gas Emissions results from a certified Green Star – Performance rating of an existing building.

How abatement is measured:

- The pre-project rating is known. Level of pre-abatement activity carbon emissions determined through energy bills and NEM region emissions intensity factor or another recognised equivalence scheme between star ratings and carbon emissions.
- Abatement activity that is included in the list of approved methodologies is undertaken.
- The building is reassessed following completion of abatement activity. Carbon abatement determined through NABERS Energy star rating carbon emissions equivalence and/or energy bills and emissions intensity factor.

Potential measurement issues:

- NABERS Energy currently applies to offices, hotels, shopping centres and data centres. May have limited application to other building types. Green Star – Performance can assist with other building types such as education, health, public building and multi-unit residential.
- NABERS Energy star ratings should be readily available to many office building owners and tenants as the Commercial Building Disclosure Scheme requires that a Building Energy Efficiency Certificate (including a NABERS energy rating) be disclosed by:
  - Building owners selling or leasing office space with a net lettable area of 2,000 square metres or more; and
  - A tenant subleasing part of their tenancy with a net lettable area of 2,000 square metres or more.

Indicative example

- A building owner retrofits an existing 50,000 sqm Sydney office building from 2 NABERS stars to 5 NABERS stars. This represents a decrease in emissions intensity from 313 kg CO_2-e/sqm/annum to 134 kg CO_2-e/sqm/annum (see Appendix B).
- Assuming constant energy use, this results in an annual reduction of carbon emissions from 15,650 tonnes CO_2-e/annum to 6,700 tonnes CO_2-e/annum.

Source: ACIL Allen 2013

Box 13 **Example 2 – Improved energy efficiency for existing industrial buildings for which a NABERS Energy star rating has not been determined**

Description of activity/changed behaviour:

Undertaking projects and/or changing practices in an existing building for which the NABERS Energy star rating has not been determined to improve the energy efficiency of that building.

How abatement is measured:

- Carbon emissions of existing building determined through energy bills and emissions intensity factor.
- Undertake project (e.g. more efficient heating and cooling) or introduce changed practices (e.g. automatic light sensors).
- Project/changed practices validated. Realised abatement calculated with reference to actual energy use and emissions intensity factor and comparison with previous level of emissions.

Potential measurement issues:

- Level of activity in industrial building (e.g. percentage of time the building is leased) may impact level of abatement – a lower level of leasing may appear to result in lower emissions and hence greater abatement.

Source: ACIL Allen 2013

Box 14 **Example 3 – New non-residential building that is more energy efficient than industry practice**

Description of activity/changed behaviour:

Build a new non-residential building that is more energy efficient than current industry practice.

How abatement is measured:

- The new building is built and its greenhouse gas emissions results from a certified Green Star as Built or Green Star – Performance rating or NABERS Energy star rating assessed.
- The delivered abatement is calculated using the difference between:
  - actual emissions (determined through NABERS Energy star rating or using energy bills and the carbon intensity factor); and
  - the NABERS Energy star rating equivalent to the Building Code of Australia (BCA) section J energy efficiency standards as the benchmark.

Potential measurement issues:

- NABERS Energy star rating currently applies to offices, hotels, shopping centres and data centres. May have limited application to other building types. Green Star – Performance can assist with other building types such as education, health, and public building.
- NABERS Energy star ratings should be readily available to many shopping centre owners and tenants as the Commercial Building Disclosure Scheme requires that a Building Energy Efficiency Certificate (including a NABERS energy rating) be disclosed by:
  - Building owners selling or leasing office space with a net lettable area of 2,000 square metres or more; and
  - A tenant subleasing part of their tenancy with a net lettable area of 2,000 square metres or more.
- A set of criteria would have to be established for determining the set of comparable buildings.

Indicative example

- A new 40,000 sqm shopping centre is built in Brisbane. After one year of operation, its NABERS Energy star rating is measured to be 4.5 stars and its emissions are 154 kg CO2-e/sqm/annum. Total building emissions are 6,160 tonnes CO2-e/annum.
- The BCA section J energy efficiency standards are calculated to be equivalent to 3 NABERS Energy stars. A shopping centre with 3 NABERS Energy performance stars would emit 229 kg CO2-e/sqm/annum. Total emissions for the 40,000 sqm shopping centre with the BCA section J standards would be 9,160 tonnes CO2-e/annum.
- The actual building abated 3,000 tonnes CO2-e/annum compared to the equivalent BCA section J standard building. The building owner could bid this 3,000 tonnes CO2-e/annum into the ERF.

Source: ACIL Allen 2013

Box 15 **Example 4 – Replace existing office building with less carbon intensive office building**

Description of activity/changed behaviour:

Replacement of an existing office building with a comparable office building with a lower carbon footprint.

How abatement is measured:

- Carbon emissions of the existing building are known through NABERS Energy star rating and/or energy bills and emissions intensity factor.
- Existing building is demolished and replaced with a new building with a comparable amount of office space.
- NABERS Energy star rating of new building determined and abatement calculated with reference to star rating, actual energy use and emissions intensity factor and comparison with previous emissions.

Potential measurement issues:

- NABERS Energy star rating currently applies to offices, hotels, shopping centres and data centres. May have limited application to other building types. Green Star – Performance can assist with other building types such as health and public building.
- NABERS Energy star ratings should be readily available to many office building owners and tenants as the Commercial Building Disclosure Scheme requires that a Building Energy Efficiency Certificate (including a NABERS energy rating) be disclosed by:
  - Building owners selling or leasing office space with a net lettable area of 2,000 square metres or more; and
  - A tenant subleasing part of their tenancy with a net lettable area of 2,000 square metres or more.
- One-off emissions resulting from the demolition of the existing building and construction of the new building may need to be considered.
- Differences in the embodied energy and related Greenhouse Gas emissions should be considered. The embodied emissions could be calculated within an approved methodology and these could be deemed to be achieved.

Indicative example

- A building owner demolishes an existing 10,000 sqm Melbourne office building with a NABERS Energy rating of 1 star and builds a 10,000 sqm office building on location with a NABERS Energy rating of 5 stars. This represents a decrease in emissions intensity 384 kg CO2-e/sqm/annum to 170 kg CO2-e/sqm/annum.
- With constant energy use, this represents more than halving of the carbon emissions per annum from 3,840 tonnes CO_2-e/annum to 1,700 tonnes CO_2-e/annum.

Source: ACIL Allen 2013

Box 16 **Example 5 – Tune-up/retrocommissioning of an existing office building**

Description of activity/changed behaviour:

Tune-up of an existing office building by rebuilding components of the heating ventilation and air conditioning system (HVAC), double glazing windows, and replacing existing lighting with LED lights.

How abatement is measured:

- Rebuilding components of the HVAC, double glazing windows and replacing existing lighting with LED lights are all deemed activities associated with deemed percentage reductions in energy use.
- Building tune-up is undertaken.
- The deemed energy savings from the list of approved methodologies for the buildings sector that would be developed for the tune up items could be used to calculate abatement. Alternatively, the building's energy bills for before and after tune-up could be compared and an energy intensity per square metre calculated.
- Abatement is either taken to be deemed or is calculated using energy bills and the carbon intensity of the electricity supply.

Potential measurement issues:

- Level of activity in office building (e.g. percentage of floor space leased by tenants) may impact level of abatement – a lower level of leasing may appear to result in lower emissions and hence greater abatement.

Indicative example

- An existing 20,000 sqm Sydney office building has a carbon emissions intensity of 342 kg CO2-e/sqm/annum before tune-up.
- After tune-up is completed, the building has a carbon emissions intensity of 200 kg CO2-e/sqm/annum.
- The building tune-up resulted in 2,840 tonnes CO2-e abatement per annum.

Source: ACIL Allen 2013

Box 17 **Example 6 – Retrofit of residential apartment buildings**

Description of activity/changed behaviour:

Reducing carbon emissions in a residential apartment building by undertaking projects and/or changed practices that increase the energy efficiency of the building

How abatement is measured:

- Determine a NatHERS Star Band rating for the residential apartment building. The NatHERS star rating indicates a maximum thermal energy load for each rating band.
- Undertake project (e.g. better insulation, renovations) or introduce the changed practices that is deemed to increase the NatHERS Star Band rating.

Potential measurement issues:

- The carbon intensity of the energy supply would have to be reassessed regularly as it will change over time. The emissions intensity of NEM electricity in NSW in 2012 was 0.904 (equivalent to 0.904 tonnes CO_2-e/MWh for the grid electricity supply).

Indicative example

- A 75,000 sqm apartment building in the Sydney CBD (in NatHERS climate zone 17 (Sydney East)) has a NatHERS Star Band energy load (thermal) rating of 1, equivalent to an energy thermal load of 230 MJ/sqm per annum.
- The building owner retrofits the apartment building so that its NatHERS Star Bank rating rises to 7, equivalent to 30 MJ/sqm per annum.
- With a NSW electricity carbon intensity of 0.904, this represents a decrease in emissions from the apartment building from 4,332 tonnes CO_2-e per annum to 565 tonnes CO_2-e/annum.

Source: ACIL Allen 2013

Box 18 **Example 7 – Warehouse installs solar PV on its rooftop**

Description of activity/changed behaviour:

A warehouse installs solar photovoltaic (PV) cells on its rooftop to partially offset its grid-supplied electricity.

How abatement is measured:

- The solar PV cells have a capacity factor of 18 per cent and generate 141.912 MWh electricity in 2014.
- The abatement resulting from the solar PV generation can only be bid into the ERF if the Small-scale Technology Certificates (STCs) are retained by the warehouse owner. This is because selling the STCs to another party would mean the carbon abatement from the solar PV cells would not be truly additional.

Potential measurement issues:

- The carbon intensity of the energy supply would have to be reassessed regularly as it will change over time. The carbon emissions intensity of NEM electricity in NSW in 2012 was 0.904 (equivalent to 0.904 tonnes CO_2-e/MWh for the grid electricity supply).

Indicative example

- A Townsville warehouse installs solar photovoltaic (PV) cells with a total capacity of 90 kW in December 2013 on its rooftop to partially offset its grid-supplied electricity. The warehouse consumes a total of 200 MWh in 2014. The average carbon emissions intensity of grid-supplied electricity in 2014 in Qld is 0.850
- The solar PV cells have a capacity factor of 18 per cent and generate 141.912 MWh electricity in 2014.
- The total carbon abatement arising from the generation of electricity by the solar PV cells in 2014 is 120.625 tonnes CO_2-e (calculated by multiplying the total electricity generated by the solar PV cells by the carbon emissions intensity of grid-supplied electricity in the relevant state/territory).
- It would be appropriate for an aggregator to bid the abatement into the ERF as the anticipated abatement per year is less than the threshold quantity of 200 tonnes CO_2-e per annum.

Source: ACIL Allen 2013

Measuring abatement

Methodology design must address risks around abatement volume, firmness of volume, and delivery to ensure that the ERF delivers credible and comparable abatement offers from parties in numerous industry sectors. This section sets out how methodologies will specify how abatement is measured, and the implications for operation of the ERF.

Uncertainty of abatement volume

It is impracticable for businesses to know with precision what level of abatement they will achieve some years later from a change in the business activities. Even in areas where there is a good deal of reliable information about emissions performance there will be some variation between planned and actual variation. There is even more variability and uncertainty in areas where the science is imperfect or where there are factors such as natural variation in climate, weather and seemingly random factors at play. There will always be a degree of variation barring completely firm abatement prospects. In reality, abatement outcomes will vary to some extent due to market and technical operating conditions that will not be able to be predicted perfectly or controlled completely.

That said, there are also differing levels of certainty associated with abatement activity in different areas of business and farming. In some areas the level of uncertainty will be higher than others often reflecting better measurement arrangements that are already deployed and used.

Risk and different degrees of certainty has significant implications for the operation of the ERF. The government aims to have binding contracts while bidders face considerable uncertainty about what they can be certain of achieving.

The reality of uncertain abatement volumes is reflected in the need to measure many factors relevant to the abatement action.

This implies that the volume of abatement recognised in any given period is uncertain ex-ante and must be determined. This reality is also reflected in existing CFI methodologies, where the Government credits volumes of abatement that based on ex-post observations. For example:

- Emissions from piggery methane capture rely on estimates of volumes of waste entering covered storage lagoons (which determines methane creation rates), and fuel use in methane capture, amongst other things
- Emissions from legacy landfill methane capture rely on estimates of volumes of methane captured and burnt, and estimates of fuel use in methane capture, amongst other things.

Some abatement services methodologies will involve fairly confident achievement of abatement performance and could operate on the basis of 'deeming' abatement on the basis of certain activities being undertaken but without detailed ex-post measurement. An example might be the installation of more efficient air-conditioners, refrigerators or other appliances. Rather than measuring actual ex-post energy use from those appliances, it will be sufficient to deem a volume of abatement over their operational life based one expected usage.

However, in terms of certainty of abatement volumes, it is unrealistic to expect each individual appliance upgrade (for example) to bid into the ERF auction. Rather, methodologies of this type rely on a more probabilistic approach to abatement estimation over a large population of possible installations/actions. Therefore, volume risk remains: fewer or more air-conditioner/refrigerator/appliance replacements might occur than anticipated. Accordingly, the general point remains that volume risk is unavoidable and must be addressed in the ERF design

Three elements of ERF design seem necessary to reconcile these difficulties:

- It should be feasible to recognise that abatement volumes bid into the auction are expected or estimated volumes;

- It should be feasible to set out where bidders are able to take responsibility for meeting abatement shortfalls if they emerge;
- Where bidders are unable to offer firm abatement amounts that are difficult for them to control, they should still be held to deliver the actions that they are able to control which is often the delivery of the abatement services methodology and the underlying change in activity that drives emissions;
- Methodologies should be specified in a way that recognises and addresses important factors that will cause the recognised (paid) volume of abatement to fluctuate in response to ex-post measurement; and
- Methodologies should also recognise events or contingencies that amount to non-delivery of abatement and which will incur penalties.

Overall, the ERF design needs to reconcile the inherent uncertainty of abatement volumes in a way that allocates the risks for both the Government and bidders to the parties most able to manage those risks. The Government must have appropriate protection against non-delivery and confidence that factors within the bidders control are controlled to deliver as close to the expected volume of abatement as possible. Similarly, bidders must have confidence that they will not be punished when factors beyond their control lead to non-delivery, or when natural variations in business activities lead to variations in the volume of abatement recognised.

Ex-post adjustment of abatement

Consistent with the approach in numerous CFI methodologies, it is reasonable to expect that ERF methodologies will define formulae setting out how abatement volumes are to be determined ex-post. In principle, each element of each formula would need to be either deemed generically or measured and reported by the abatement provider. Ultimately what is captured formulaically and measured ex-post, and what is estimated or modelled ex-ante and deemed on this basis without further measurement, relies on practical judgements of transaction/measurement costs and the risks of bidders gaming government, amongst other things. These questions cannot be determined generically for all methodologies up front.

Penalties

The approach of determining abatement volumes ex-post in accordance with measured outcomes is designed to work within a structure of bids setting out a central estimate of abatement volume, whilst allowing actual volumes of abatement to vary ex-post. However, a methodology should be able to set out pre-determined circumstances which constitute non-delivery, and for which penalties are incurred.

For example, project failure would typically constitute non-delivery. Further, failure to use a facility as intensively as expected could be considered to constitute non-delivery. For example, a piggery methane capture facility would capture less methane if fewer pigs are farmed (resulting in a lower volume of waste). If anticipated volumes fell below a certain percentage of anticipated volumes, this could be deemed to constitute non-delivery. Similarly, if a power station efficiency improvement were supported, reductions in output below a certain percentage of anticipated output at the power station could constitute non-delivery.

Non-delivery penalty rates should be the same for all bidders bidding at the same auction, and should be pre-determined and transparent (so bidders can make appropriate allowances).

A key benefit of a clear non-delivery penalty structure is that it places the onus on bidders to make risk-adjusted bids that reflect their probability of non-delivery, and therefore captures the risk of non-delivery in the bid price. Such penalties will likely also affect bid volumes as a risk management response.

Overall, penalties for non-delivery appear the most credible mechanism for internalising the risk of non-delivery in bid prices as they avoid requiring the government to make difficult judgments about the relative risk of non-delivery between projects during the auction process.

Reporting, verification, auditing and payment

This section discusses matters relating to verification of contracted abatement and payment for delivery. Where possible, existing measuring, reporting, verification and auditing processes should be used in the ERF. In the interests of upfront transparency for bidders, fairness for all parties at the auction and simplicity in post-auction negotiations, it is ideal for measurement and reporting requirements and verification and audit processes to be specified for each methodology. However, in some cases these matters may need to be specified in the contract between the Australian Government and abatement provider.

Reporting, verification and auditing

Reporting, verification and audit processes will be methodology specific. Whichever factors are determined within a methodology to affect abatement will need to be, at a minimum, reported, and possibly also subject to external verification or auditing. Factors requiring measurement might vary from output and/or emissions at a major industrial plant or electricity generator, volumes of methane captured at a coal mine or landfill facility, volume of piggery waste treated at a piggery, or tenancy rates at a non-residential building (to deem energy efficiency savings based on occupancy).

The verification and reporting arrangements indicated in a methodology for particular abatement services will have to reflect a judgement by government about the risks associated with the potential non-delivery of the abatement. Where it is considered that there is a high risk of non-delivery of abatement associated with particular abatement services, it would be appropriate that the verification arrangements in the methodology are more stringent and the reporting on delivery is more frequent relative to abatement the delivery of which is considered to be more certain.

Similar considerations will apply to the methodologies associated with new technologies – it would be appropriate for their methodologies to employ stringent verification and reporting regimes to mitigate the risks of abatement non-delivery.

The ERF should use existing measuring, reporting, verification and auditing processes wherever possible. For example, the property sector could use the NGERS reporting, verification and auditing arrangements. The NGERS scheme is a national framework for corporations to report on greenhouse gas emissions, energy use and energy production. Large entities in the property sector are experienced with this regime as they are required to report through it and are subject to an NGERS audit regime.

Cost and practicality considerations will determine whether reporting subject to spot audits is sufficient to promote compliance, or whether every measurement needs to be externally verified. The appropriateness of these decisions will vary based on the materiality of each factor's effect on emissions/abatement, the difficulty of measuring and post-hoc auditing the relevant factors and the risk of gaming in the absence of strict verification.

Some factors may be sufficiently 'irreversible' or unlikely to be reversed that a once-off verification would be sufficient to underpin ongoing crediting. For example, construction of a house or building, or installation of an efficient water heater or refrigerator, is unlikely to be undone once constructed/installed, as there is a strong economic incentive to use the asset after that point. These decisions might be made subject to compulsory once-off verification, or spot auditing over the life of the abatement payments.

Timing of payments

While government has indicated that payment should be made on the delivery of abatement, we consider that government may find it more useful to use an alternative approach.

Government appears to be concerned that payment should be made for the delivery of abatement. This is understandable as it would minimise financial risk to government. However, every set of arrangements carries risk and the question is how risk is distributed among government and the parties providing abatement services. Making payment on delivery may reduce the chance of parties offering abatement into the ERF, particularly if the set-up costs of delivering abatement services are material. In addition, there are alternative approaches to managing the risk of non-delivery.

We consider that a reasonable approach to paying providers of abatement services is that government pays the provider of guaranteed offers 50 per cent of full value of the services fee, taking into account the time-value-of-money, at the time the contract is formed and making payment under standard offers on performance. While this places some delivery risk on government, those risks can be addressed through:

- the processes for reporting, verification, and auditing being tailored in each methodology to the particular characteristics and delivery risks associated with the particular abatement services;
- the arrangements for bidders of guaranteed offers to ensure they deliver the full quantity of abatement they are contracted to deliver, either by themselves or through another party, together with penalties for non-delivery of contracted abatement after a period of grace; and
- the arrangements for bidders of Standard Offers to pay penalties if they do not deliver contracted abatement due to circumstances within their control such as ensuring that they deliver the contracted amount of abatement service activity.

Aggregation of abatement actions

It will be important to minimise the administrative and other transaction costs associated with the ERF. This is particularly important given that carbon abatement is unlikely to be the core activity of many parties that have the potential to offer abatement into the ERF.

Given this, as discussed in section 3, it would be useful to allow RAEs to register as Aggregator RAEs and make offers for abatement into the ERF that are delivered by other parties. Conceptually, Aggregator RAEs might act through a contractual approach (e.g. a consortium) or by coordinating the actions of parties that effectively 'assign' abatement rights to the aggregator in exchange for a financial or other benefit. The former case would likely involve large, well-informed parties who, for various commercial reasons, might wish to combine for the purpose of interacting with the ERF. The latter case is critical and it appears the most practical mechanism for coordinating abatement actions at the household or small business level.

It is essentially the same approach as used for small-scale photovoltaic and solar water heater installations under the Small-scale Renewable Energy Scheme, where households assign certificate creation rights to installers, or under various white certificate schemes.

For the purpose of the ERF, it is critical that aggregated abatement bids can be readily assessed alongside non-aggregated bids. The key element of that is ensuring that measurement, reporting, verification, auditing and payment processes address specific issues that arise in the case where Aggregator RAEs act on behalf of other parties.

The key principle here is that, as the party contracted by government, an aggregator would be responsible for the delivery of all matters detailed in a contract awarded through the ERF including the abatement. The aggregator would receive all revenues from the government under the ERF and bear all penalties (if any) for non-delivery. The allocation of financial risks and incentives between an aggregator and the parties it is engaging with to create abatement would be determined by those parties and specified in any contracts between them.

The critical thing from the Government's point of view is that measurement and reporting obligations are practically able to be fulfilled by the Aggregator RAE with the cooperation of its related parties, and that the Clean Energy Regulator retains the same verification and auditing rights as for all other bids to the ERF. In terms of measurement and reporting, any ongoing measurement and reporting requirements must be complied with by the Aggregator RAE, and it seems sufficient for the commercial risk of non-delivery penalties for it to ensure that this is adequately specified in any contracts it enters into.

This is also likely because projects that require ongoing and measurement are more likely to be undertaken by entities that generate significant volumes of abatement and are relatively well-informed as to the operation of the scheme.

By contrast, where households and small businesses are involved, regular measurement and reporting seems impractical, and they are more likely to be engaged by aggregators for actions that involve once-off decisions to install more efficient equipment. This once-off decision would likely result in deemed savings over its life that are not directly measured ex-post. However, such actions still need to be subject to verification and/or auditing. If the initial installation is subject to verification, it would be necessary for any assignment documentation signed by the household or small business to specify that it will comply with reasonable requirements of a verifier appointed by the Aggregator RAE. Alternatively, if that action is simply subject to spot audits, the assignment documentation would need to specify that the household/small business would need to cooperate with auditing processes conducted on behalf of the Clean Energy Regulator.

There may be a role for the Government in designing standardised assignment documentation that Aggregator RAEs can use.

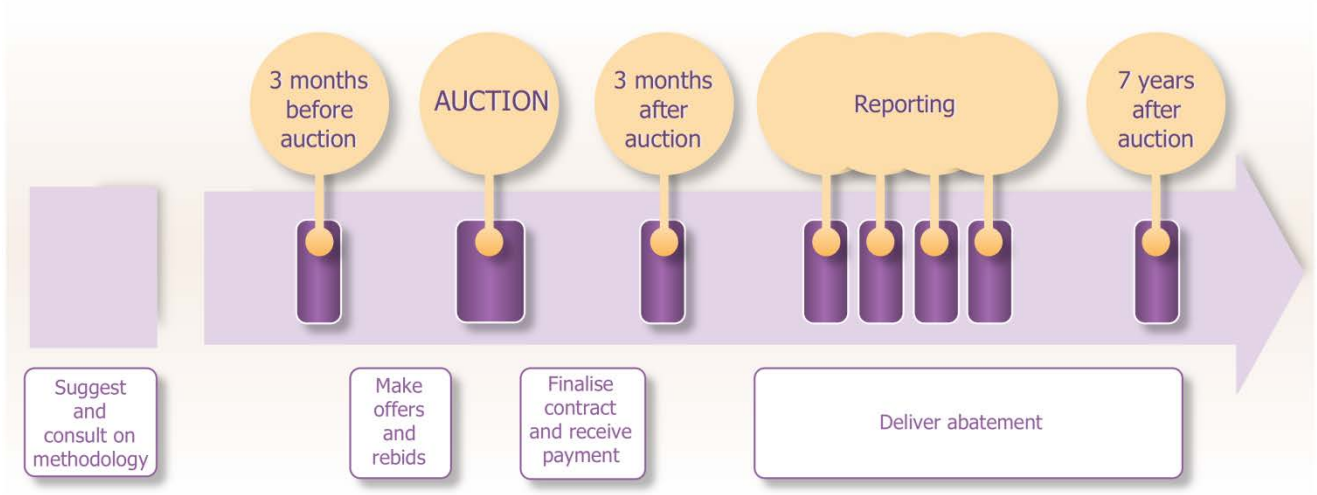
5 Other matters relevant to the ERF

This chapter discusses a number of other relevant issues of interest to parties interacting with the ERF.

How bidders interact with the ERF

Parties bidding to offer abatement through the ERF will likely interact with the ERF over a period extending before and after the auction itself. Figure 3 below provides an indicative timeframe for bidders' various interactions with the ERF pivoted around quarterly auctions.

Figure 3 **Bidders' interactions with the ERF**

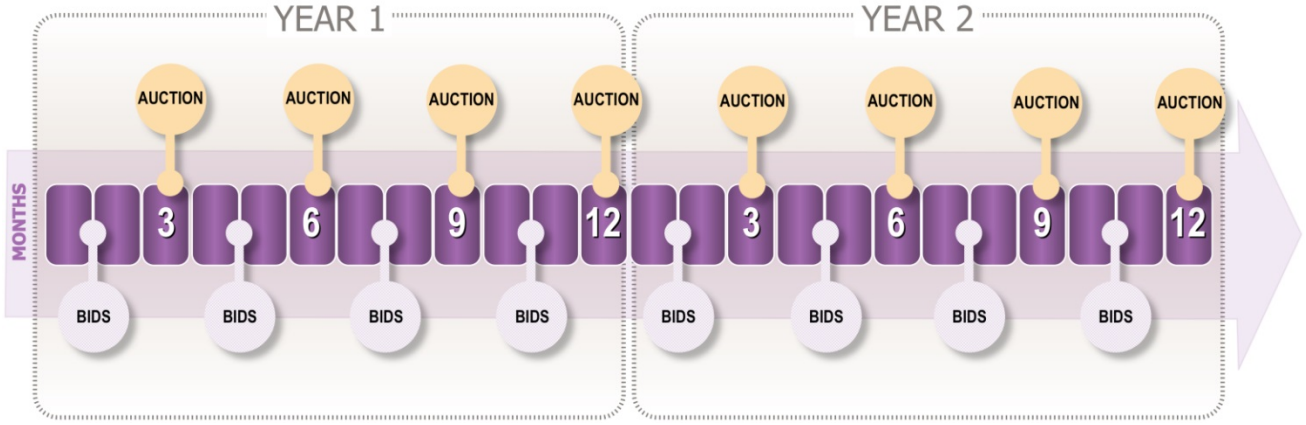


Source: ACIL Allen 2013

Auction timetable

Figure 4 below provides an overview of the timeframes for bidding and the holding of the quarterly auctions over two years.

Figure 4 **Timeframe for bidding and auctions**



Source: ACIL Allen 2013

Penalties for emissions above baselines

The Direct Action policy includes the potential for penalties on businesses whose emissions rise above their baseline. Section 6 includes high-level discussion on matters relating to this aspect of the policy.

6 Compliance and penalties for emissions above baselines

The Direct Action policy also includes potentially imposing penalties on businesses whose emissions rise above their baseline level of emissions. This policy is separate to the Emissions Reduction Fund and is treated separately in this report.

There are numerous conceptual challenges regarding the 'penalties for emissions above baselines' policy. There are also likely to be operational challenges in its implementation.

This chapter includes high-level discussion on key matters relevant for the policy.

Baselines for existing businesses throughout the economy

Baselines are relevant for the aspect of the Direct Action policy that relates to potential penalties on businesses that exceed their baseline of emissions.

The essential choice with baselines is whether to use an absolute baseline or an intensity baseline. Different issues arise with each approach.

With an absolute baseline, there is a risk of penalising companies that expand production, irrespective of the efficiency of that production. It is possible that a new company or operation could displace a less efficient company yet still be penalised.

A further complication arises as to the level of measurement. Due to divestments and acquisitions, the company is not really the correct level at which to calculate baselines, with the 'facility' being a better measure. In this way, baselines are more robust to changes of ownership. NGERS includes reporting at the facility level, but definitional issues can arise with some companies grouping separable operations as a single facility and some not.

If intensity baselines are used, the same issues above can arise, but a key further issue is the denominator for calculating the intensity baseline. The key choice is whether to use:

- emissions per unit of physical output; or
- emissions per unit of economic activity (e.g. dollar of value-added or taxable profit).

If a physical output measure is used as a denominator, baselines need to be calculated for a great range of diverse products. Almost all companies will produce multiple products, and so each of these products will need to be baselined. Where they are produced at the same facility, there is a need to attribute emissions between each product, which may not be possible. Economic value of output measures will be affected by factors beyond the control of the firm, e.g. minerals prices, and will be affected by changing product mix. For example, if Wesfarmers divested its coal business, its emissions per dollar of taxable profit would reduce greatly.

All baselines also face difficult choices around scope such as whether only direct ('Scope 1') emissions to be included, or whether Scope 1 and Scope 2 or other embodied emissions are included.

Baselines for new businesses throughout the economy

Baselines for new businesses could be benchmarked to emissions per unit physical output in many cases, particularly where products are standardised and there are a large number of producers in operation in Australia. This would be more difficult for emissions per unit of economic value added, but could potentially be benchmarked to similar businesses in some cases.

If facilities rather than businesses are the operational units that are baselined, these issues transfer over to all new facilities rather than new businesses.

Baselines for the property sector

Similar issues regarding baselines for firms across the economy are likely to be applicable to property sector firms.

For the property sector, it might be possible to distinguish between emissions in, say, residential and non-residential construction. It might then be possible to benchmark these to, say, emissions per sqm of residential construction for comparison across years.

Adjustment of baselines

Conceptually, baselines should be adjusted from time to time to reflect changing circumstances.

Determining a principle to use to adjust baselines may be challenging. Options for such a principle include:

- leaving them constant and reassessing them at a future point in time; and
- applying a standard decline rate.

Penalties and conditions

We have discussed above some of the conceptual and operational challenges arising with setting baselines for businesses and at the facility level and determining whether emissions exceed baselines.

If government seeks to place penalties on businesses that exceed their baseline emission levels (at either the business or facility level), it may be appropriate for the level of any penalty for emissions above the baseline level to be at the most recent market price of abatement as revealed through the ERF auction.

Offset regime

An offset regime could allow corporations who exceed their baseline emissions to offset any emissions above their baseline through abatements to avoid a penalty.

This could be done by the registration of abatement actions that are eligible to be offered into the ERF auction with the Clean Energy Regulator. Only abatement that has not been contracted by the Commonwealth for delivery would be able to be so registered. Any such abatement would have to occur within five years of the corporation emitting greenhouse gas emissions above its baseline.

However, on the assumption that abatement costs rise as cheaper abatement options are exhausted, it seems unlikely that parties would choose to purchase offsets rather than the penalty if the penalty is set at the level of the ERF auction. However, timing of the respective payments might create a time-value-of-money incentive to utilise offsets rather than paying a penalty.

Appendix A Report scope

This appendix lays out the scope for this project

Preferred design for the auction system

To provide advice on a preferred design for the auction system mechanism, including:

- The factors that should be taken into account in making decisions about the tenders to accept – e.g. price, abatement volume, timeliness of abatement, degree of confidence of delivery of abatement, and the inclusion and treatment of other factors (e.g. addressing calls for inclusion of other impacts on the environment, regional community impacts, etc.);
- The activities that can be offered (and delivered) to provide abatement;
- The price to be paid for winning tenders – e.g. the marginal price, the bid price, or the average price;
- Whether there should be an abatement target in combination with cost target (e.g. there is an abatement cap in addition to a cost cap for each auction);
- The frequency with which auctions are conducted – e.g. monthly, quarterly, annually, every two years, or every five years;
- The timeframes over which there are abatement targets or caps – e.g. over periods of one year, two years, or longer;
- The structure of the auction e.g. whether there should be an Expression of Interest round prior to the auction and/or multiple auction rounds and whether the action should be carried out differently for different categories of bidders similar to Government bond tenders that provide for participation in prequalified 'wholesale' auctions with links to 'tap' arrangements for smaller scale 'retail' bidders.
- Approaches to the release of information about the price of carbon abatement giving guidance to bidders and the economy at large.
- Means to accelerate the delivery of abatement from different sectors/activities that are most ready to offer and provide the largest amount of abatement from readily verifiable sources reflecting the circumstances of those industries and activities.
- Implications for funding/incentives from complementary schemes – VEET, PACE/EUAs;
- Special arrangements – tenants, government as property owner or tenant.

A preferred design for the bid and aggregation mechanism

To provide advice on a preferred design for the bid and aggregation mechanism, including:

- The information requirements for parties to meet in making bids;
- Definitions of offer quantities of abatement – especially defining how bids that offer verifiable large scale abatement receive priority;
- Connections to existing information systems about the measurement of emissions baselines and validation of abatement.
- Definitions of other matters if any that will be taken into account in considering offers (e.g. other holistic environmental benefits such as water use, indoor environmental quality, regional and community impacts, innovation etc.).
- Definitions of offer prices for abatement;
- The timeframes over which parties can bid to provide abatement (e.g. a fixed number of years or flexibility in the numbers of years);

- Pre-qualification mechanisms to allow parties to be pre-approved to make bids;
- Minimum information requirements for aggregators to make bids;
- Potential pre-approval of aggregators to act as an agent for other parties;
- Allocation of risk and responsibilities between aggregators and the parties they are acting on behalf of.

Preferred framework for approval of methodologies

To provide advice on a preferred framework for approving methodologies, including:

- The extent to which the general Carbon Farming Initiative methodology is able to be adopted for other sectors;
- Whether methodologies should be industry or bidder specific, and the process for adopting methodologies – e.g. who approves a methodology, how a methodology can be amended, whether Parliament can disallow a methodology etc.
- Mechanisms to use when assessing and accepting bids (e.g. how to balance key dimensions such as price, quantity, time, risk/uncertainty and other factors if they are included);
- Novation of rights and obligations (including potential for securitisation).

Preferred mechanism for verification and payment

To provide advice on a preferred verification and payment mechanism, including:

- The timeframes over which successful bidders will be required to deliver abatement – including whether timeframes for delivery will be fixed or whether there will be flexibility, and whether these will vary across bidders and/or industry sectors;
- The requirement for successful tenderers to report over the timeframe for the delivery of abatement – e.g. annually or every two years, and requirements for successful tenderers to be audited;
- The timeframes over which successful tenderers are paid – e.g. after all the tendered abatement has been delivered or after specified stages of abatement have been delivered;
- The penalties (if any) on successful tenderers for non-delivery of the abatement purchased through the Emissions Reduction Fund.
- Novation of rights and obligations.

Preferred high level mechanism for compliance and penalties

To provide advice on a preferred high level mechanism for compliance and necessary penalties including:

- Settlement arrangements
- Probity matters
- Broad approach to determining baselines for existing businesses property portfolios;
- Approach to determining baselines for new businesses;
- The frequency and way in which the baseline is adjusted (e.g. to take account of changes in technology change and economic conditions);
- Accommodation of other exogenous factors that could influence abatement delivery – the weather, changes in policy etc.;
- Inclusion of an offset regime (to assist in the management of risk); and

- The conditions under which for which a penalty could be placed on a party and the potential penalties for non-compliance or compliance shortfalls;
- Partial payment mechanism for exogenous factors;
- Periods of grace for rectification of shortfalls.

Appendix B NABERS star band rankings and greenhouse gas emissions for office buildings 2010

Table B1 below provides an extract of the 2011 Allen Consulting Group report *Tax incentives for green retrofits of commercial buildings* which detailed the energy efficiency of buildings associated with various NABERS star ratings. Recently the NABERS star bands have increased to 6 stars which would advance the rows in the table.

Table B1 **NABERS star bands and greenhouse gas emissions from office buildings (kg CO_2/sqm)**

Stars	ACT	NSW	NT	QLD	SA	VIC	WA	TAS
Whole building								
1.0	372	372	178	329	361	384	284	399
1.5	342	342	163	304	331	357	263	366
2.0	313	313	148	279	301	330	242	333
2.5	283	283	133	254	271	304	221	300
3.0	253	253	118	229	241	277	200	267
3.5	223	223	102	204	211	250	179	234
4.0	193	193	87	179	181	223	158	200
4.5	164	164	72	154	151	197	137	167
5.0	134	134	57	129	121	170	116	134
BASE BUILDING								
1.0	199	199	96	156	201	225	158	230
1.5	183	183	88	146	185	209	147	212
2.0	167	167	80	136	169	194	136	194
2.5	151	151	72	126	153	178	125	175
3.0	135	135	63	116	136	163	114	157
3.5	119	119	55	106	120	147	103	138
4.0	103	103	47	96	104	132	92	120
4.5	87	87	39	86	88	116	81	101
5.0	71	71	31	76	72	101	70	83
TENANCY								
1.0	172	172	81	173	160	159	126	168
1.5	158	158	74	158	146	148	116	153
2.0	144	144	67	143	132	137	106	139
2.5	131	131	60	128	118	125	96	124
3.0	117	117	54	113	104	114	86	110
3.5	103	103	47	98	90	103	76	95
4.0	89	89	40	83	76	92	66	80
4.5	76	76	33	68	62	80	56	66
5.0	62	62	26	53	49	69	46	51

Source: Allen Consulting Group analysis, 2010. Note: The table uses an average emission intensity of 0.23 kg CO2-e / MJ.

Appendix C NatHERS Star Band criteria

This appendix includes the NatHERS Star Band criteria downloaded from the NatHERS website (www.nathers.gov.au) as of October 2013.

ACIL ALLEN CONSULTING PTY LTD
ABN 68 102 652 148

LEVEL FIFTEEN
127 CREEK STREET
BRISBANE QLD 4000
AUSTRALIA
T+61 7 3009 8700
F+61 7 3009 8799

LEVEL TWO
33 AINSLIE PLACE
CANBERRA ACT 2600
AUSTRALIA
T+61 2 6103 8200
F+61 2 6103 8233

LEVEL NINE
60 COLLINS STREET
MELBOURNE VIC 3000
AUSTRALIA
T+61 3 8650 6000
F+61 3 9654 6363

LEVEL ONE
50 PITT STREET
SYDNEY NSW 2000
AUSTRALIA
T+61 2 8272 5100
F+61 2 9247 2455

SUITE C2 CENTA BUILDING
118 RAILWAY STREET
WEST PERTH WA 6005
AUSTRALIA
T+61 8 9449 9600
F+61 8 9322 3955

ACILALLEN.COM.AU