



Australian Government
Climate Change Authority

USING INTERNATIONAL UNITS TO HELP MEET AUSTRALIA'S EMISSIONS REDUCTION TARGETS RESEARCH PAPER

JULY
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CLIMATE
CHANGE
AUTHORITY

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SUMMARY

Climate change is a global phenomenon. In its Targets and Progress Review, the Authority argued that international emissions reductions should be used to complement domestic efforts to meet Australia's emissions reduction target.

This paper provides detailed information on the practicalities of using international units. It examines a range of different types of units and flags those which Australia might use. There is a large quantity of units available in the market that could meet Australia's needs at very low prices (currently around \$1 or less per unit). Using international units would be relatively straightforward to implement and not very resource-intensive.

International trade in emissions reductions has a legitimate place in reducing greenhouse gas emissions. As long as the underlying emissions reductions are genuine, they have the same effect on global climate outcomes as domestic reductions.

International trade offers Australia access to genuine emissions reductions from around the world. By expanding the set of emissions reduction opportunities, trade helps reduce costs and can support stronger targets where it may not be cost effective to do this through domestic actions alone. International emissions reductions can therefore be seen as an environmentally sound and cost-effective complement to domestic emissions reductions for Australia.

While the material in this paper is directly relevant to how international units (including the particular units that might be accessed) can be used to meet Australia's 2020 target, be it a reduction of 5, 15 or 19 per cent or whatever, the primary purpose of this paper is to argue the general case for the use of international units and how this could be best executed.

In preparing this paper, the Authority consulted widely with market analysts, fund managers, administrators of other government purchase programs, multilateral development banks and other interested stakeholders.

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1

INTRODUCTION

1.1 PURPOSE AND SCOPE

The Climate Change Authority is an independent statutory authority, established to provide expert advice on Australian climate change policy. Its work is guided by a set of principles under the *Climate Change Authority Act 2011* (Cth) which requires that climate change measures should be economically efficient, environmentally effective, support the development of an effective global response to climate change, and be consistent with Australia's foreign policy and trade objectives. These principles have guided the analysis in this report.

As a high-emitting developed country, Australia has a responsibility to bear its share of the deep reductions required in global emissions to hold global average temperatures below 2 degrees compared with pre-industrial levels.

Australia can complement its domestic efforts by purchasing genuine emissions reductions from elsewhere in the world: they will have the same effect on climate outcomes as domestic reductions. Global carbon markets make it possible to access these reductions. By expanding the available set of emissions reduction opportunities, they help to reduce costs and drive greater action.

In its report, *Reducing Australia's Greenhouse Gas Emissions—Targets and Progress Review, Final Report* (CCA 2014), the Authority recommended that the government:

- use international emissions reductions to bridge the gap between domestic reductions and its recommended target
- establish a fund to purchase international units for this purpose.

This paper examines the general case for the use of international emissions reductions in more detail. It investigates:

- the benefits and risks of using international units (Chapter 2)
- the types of units that would be suitable for Australia to use (Chapter 3)
- the availability and costs of those units (Chapter 4)
- arrangements for actually purchasing those units (Chapter 5).

The paper draws on lessons from international experience and over a decade of carbon market operation. In conducting this research, the Authority has consulted widely with market analysts, fund managers, administrators of other government purchase programs, multilateral development banks and other interested stakeholders.

1.2 POLICY CONTEXT

Australia has joined the second commitment period of the Kyoto Protocol, which covers the period 2013 to 2020. The Kyoto Protocol allows for trade in emissions reduction units to give countries more flexibility to meet their targets. Australia's Kyoto Protocol target is net of trade—emissions reductions purchased count toward the target; those that are sold do not (Appendix A provides more information on the Kyoto Protocol).

The government can buy international units directly through a government purchase program, or make arrangements to encourage private sector purchases.

Other countries have used both of these approaches to help achieve their emissions reduction targets. The European Union Emission Trading System (EU ETS) for example, allows liable facilities to use a limited number of international units towards meeting their compliance obligations under that system. New Zealand also provides for international units to be used against obligations under its domestic scheme. Japanese businesses purchased international units to achieve their targets in the period to 2012. Many national governments have established purchase programs to buy international units directly, including Japan, Norway, Sweden, Austria and France.

The Australian Government intends to replace the carbon pricing mechanism, which is designed to allow liable entities to purchase international units, with the Direct Action Plan. The Emissions Reduction Fund (ERF), which is to be the centrepiece of the Plan, will purchase emissions reductions from individuals and businesses. It will also 'safeguard' emissions reductions achieved by imposing compliance obligations on some large facilities that exceed their historical emissions baseline; this safeguard mechanism is still being designed.

The government is committed to reducing emissions by 5 per cent (compared with 2000) by 2020, and will review this target in 2015. International emissions reductions could have a role to play in meeting the 5 per cent target in the event that domestic efforts fall short. Submissions on the development of the ERF suggested that the government establish a 'strategic reserve' of this nature (AiGroup 2014, BCA 2014). International emissions reductions could also be used to go beyond the minimum 5 per cent target and achieve a stronger target in a cost-effective way as recommended by the Authority.

This paper is intended to provide a constructive contribution to Australia's consideration of the use of international units in helping to meet its emissions reduction targets now and into the future.

BENEFITS AND RISKS OF USING INTERNATIONAL UNITS

2

International units can be used to help meet Australia's goals—they could reduce costs, help to address competitiveness concerns, and support broader Australian trade and foreign policy objectives. The end result can be to encourage stronger action to reduce emissions, both in Australia and overseas.

There are some risks, notably ensuring that international emissions reductions are genuine. These risks can be effectively managed by good governance and judicious access arrangements.

International emissions reductions can complement domestic efforts, in the period to 2020 and beyond. This chapter looks at the benefits and risks.

Under the Kyoto Protocol, international emissions reductions are represented by units. Each unit corresponds to one tonne of carbon dioxide equivalent (CO₂-e). To meet its Kyoto Protocol target, a country must retire a unit for every tonne of its emissions over the relevant period. Countries with targets can trade units. Units can also be generated from projects that reduce emissions in developing countries; buying countries can also use these units to meet their obligations (see Appendix A for more information on the Kyoto Protocol).

2.1 THE BENEFITS

Benefits to using international units to complement domestic emissions reductions include:

- providing access to a wider range of cost-effective emissions reduction opportunities, which lowers the overall cost of meeting Australia's targets, potentially making stronger targets more achievable.
- supporting other trade, foreign policy and development objectives
- in the long term, helping to address competitiveness concerns for industry by levelling out prices of emissions reductions across countries.

Trade can also meet other important objectives and provide benefits for sellers of units: the Clean Development Mechanism (CDM) for example, has facilitated domestic emissions reduction policies in developing countries, capacity-building for reporting and measuring emissions, and technology transfer (Stavins et al. 2014).

There is broad support for using international emissions reductions in Australia. Almost all stakeholders consulted by the Authority when preparing its Targets and Progress Review, including industry and environment groups, supported using international units to complement domestic efforts.

Many submissions in respect of the ERF also supported the use of international units, including to address competitiveness concerns, encourage a more robust global response to climate change and to lower the costs of compliance (BCA 2014; AiGroup 2014; The Climate Institute 2014; WWF Australia 2014).

2.1.1 LOWERING COSTS

Trade in emissions units can give countries and businesses access to a wider range of emissions reduction opportunities than might exist domestically. Each country has different emissions reduction opportunities with different costs. From a buyer's perspective, having access to a wider range of opportunities allows for the lowest cost options to be pursued first, regardless of where in the world they occur, reducing the cost of achieving any given target. From a seller's perspective, trade can lower the costs of choosing a less emissions-intensive development path by facilitating technology transfer and building policy expertise.

The Authority argued in its Targets and Progress Review that a mix of domestic and international emissions reductions would be a significantly cheaper option for Australia than if it used domestic reductions alone. Modelling suggested that by 2020 a domestic incentive comparable to a \$65/t carbon price could be needed to achieve the minimum 5 per cent target through domestic reductions alone.

The international market is currently oversupplied with genuine international emissions reductions which are available at historically low prices. Prices are expected to remain low in the period to 2020 (less than \$1.15 per unit). Even if global demand significantly increased, many new projects would be able to supply units at low prices (less than \$7 per unit, see Chapter 4). At these prices, international units would be cost-effective compared with many domestic opportunities.

2.1.2 TRADE AND FOREIGN POLICY OBJECTIVES

Purchases of international units can be tailored to advance other foreign policy and trade objectives. Australia could prioritise emissions reductions from neighbouring countries that are a particular focus of its development agenda or projects that use Australian technology, inputs or skills.

Such arrangements could also help foster better relationships between Australia and the countries concerned. It may be unhelpful, however, if Australia only allowed units tied to such objectives and this resulted in significantly reduced supply and increased costs.

2.1.3 LONG-TERM COMPETITIVENESS

Using international units can help to address industry competitiveness concerns by providing a cost-effective source of emissions reductions. Depending on policy design, trade in emissions reductions could also help to level out the prices of (or incentive for) emissions reductions across countries. If a business has access to international emissions reductions to meet obligations established under a domestic policy, it would pay the international price for emissions reductions, rather than possibly higher costs imposed by the policy.

Removing or reducing competitiveness concerns can make it easier to set stronger emissions reduction goals.

2.2 THE RISKS

Using international units to help meet Australia's target entails some risks, including:

- purchasing non-genuine emissions reductions
- market fraud
- delaying the transition to a low-emissions economy through desirable domestic structural adjustment

The Authority believes these risks can be managed; some strategies to this end are discussed below.

2.2.1 ENVIRONMENTAL INTEGRITY

It is important that international emissions reductions are genuine and are backed by real emissions reductions. Appropriate measurement, reporting and verification arrangements are essential to ensure the environmental integrity of units.

The focus here is on international units that count towards Australia's target under the Kyoto Protocol framework. The Kyoto Protocol has a robust system of compliance where each unit is underpinned by comprehensive emissions reporting arrangements that are subject to international review. Each unit can only be used once—if Australia uses an international emissions reduction, then the selling country cannot use it and must therefore reduce its emissions by one tonne.

To provide additional flexibility, the Kyoto Protocol also established the CDM, which has operated since 2006 and has detailed rules and governance arrangements to ensure credited emissions reductions are genuine. Its operation has improved over time, and its Executive Board has made a concerted effort to identify and address environmental concerns. It now operates with a high level of environmental integrity, and has similar governance arrangements and verification processes to those planned for Australia's ERF (see Box 2.1).

The Kyoto Protocol gives each country flexibility to choose the units it will use. Australia could target its purchase of international emissions reductions to those with a high level of environmental integrity. The Authority's assessment of the environmental effectiveness of different types of eligible Kyoto Protocol units is presented in Chapter 3.

BOX 2.1: THE CLEAN DEVELOPMENT MECHANISM

Like the ERF, the CDM is a baseline-and-credit scheme where projects earn units by reducing emissions below a defined baseline. Project developers present plans and methodologies to the CDM Executive Board for its initial approval. The board must be satisfied the emissions reductions are 'additional' to what would have occurred without the project and that the project would not have occurred without the financial incentive provided by the CDM. The project must also be validated by an independent auditor to ensure the reductions are genuine, measurable and verifiable. The board must approve the project before CDM units can be issued. There are periodic independent reviews of projects to verify that emissions reductions occur.

The CDM Executive Board is supported by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, including its roster of experts and a number of specialist panels and advisory groups.

Many of the concerns raised about whether emissions reductions generated from the CDM are genuine relate to the question of 'additionality'—whether the reductions would have happened anyway. As with all baseline-and-credit schemes, this can be difficult to determine. Over time, the CDM has developed a sophisticated set of methodologies and rules to test whether reductions are additional and these are improved over time.

The CDM covers a large range of emissions reduction activities, including renewable energy, energy efficiency and the destruction of waste coal mine or landfill gas. Many of these are similar to the sorts of projects and activities the government expects to fund under the ERF. Where appropriate, CDM methodologies are expected to be adapted for use in Australia under the ERF.

2.2.2 CARBON MARKET FRAUD

If units are illegally issued or stolen, this can compromise the environmental integrity of the policy (if, for example, it results in the same emissions reductions being counted twice), as well as causing possible financial losses.

The risk of fraud exists as it does in most markets. Trading in financial and other goods and services, even in Australia, has some risks. The challenge is to manage their risks, not avoid markets which can deliver potential benefits.

Generally robust governance arrangements apply to these markets today. The Kyoto Protocol uses a system of electronic registries to issue and track all units. The rules governing these registries are subject to international oversight; the rules ensure that the correct number of units is issued and that they are not counted twice. In the case of the CDM, the registry is governed by the Executive Board and operated by the UNFCCC secretariat.

Some well-publicised incidents of fraud have occurred in the EU ETS. In 2010–11, about two million European units were stolen from individual accounts. The EU responded by immediately suspending trade in units until new security requirements were implemented. It also revised its systems to reduce the risk of similar events occurring—replacing the national registries of EU member states with a single EU-wide registry and tightening its rules on proof of identity. To further protect against fraud, the European Commission is aligning the rules governing the carbon market with other European financial markets.

2.2.3 AUSTRALIA'S TRANSITION TO A LOW-EMISSIONS ECONOMY

Deep cuts in global emissions are required if warming is to be kept below 2 degrees. A steady transition of the Australian economy could help improve Australia's long-term competitiveness in a more emissions-constrained world. If Australia relied too heavily on international emissions reductions (rather than reducing its domestic emissions), it could face a more costly and disruptive transition. Further, rapid and unexpected increases in the price of international units would make it more costly for Australia to meet its targets.

A mix of domestic and international emissions reductions therefore represents the best approach to meet Australia's goals, both to continue its transition to a low-emissions economy, and to help manage the risks of rapid and unexpected increases in the price of international units. In the short term, and particularly in the period to 2020 when the domestic opportunities for cost-effective emissions reductions are limited, it makes good sense for Australia to use some international emissions reductions.

The Authority considers a balanced approach to using international units to help meet Australia's targets offers significant benefits including lower costs and industry competitiveness, and in turn may help to drive stronger climate action over the years immediately ahead.

TYPES OF UNITS AND PURCHASING PRIORITIES FOR AUSTRALIA

3

The Kyoto Protocol provides access to a wide range of genuine international units to use towards Australia's 2020 target. An assessment of each unit type suggests that some units could be more attractive than others.

The following types of units would be most suitable for Australia to use:

- CERs and ERUs from the first commitment period (subject to some exceptions, discussed below)
- CERs from the second commitment period from projects in countries where arrangements are in place to avoid double-counting of the emissions reductions, and from countries that require assistance to reduce their emissions such as least-developed countries
- second commitment period AAUs, if satisfied with the stringency of the country's target
- RMUs
- ERUs from the second commitment period.

For various reasons, the Authority believes the following units should be avoided:

- temporary CERs
- CERs and ERUs from industrial gas destruction projects
- CERs and ERUs from large hydro-electric generation projects that do not meet criteria established by the World Commission on Dams
- first commitment period AAUs.

The Targets and Progress Review canvassed the following potential sources of credible international emissions reductions:

- the UNFCCC and Kyoto Protocol market mechanisms, such as the CDM
- established emissions trading schemes, such as the EU ETS
- bilateral offset mechanisms, whereby countries work together to establish programs and projects that generate emissions reductions.

This chapter builds on the Review, and considers different possible international units and identifies those that it considers would be suitable for Australia to use to help meet its 2020 goals.

3.1 A FRAMEWORK FOR ASSESSING UNITS

The Authority's statutory principles provide a good basis for assessing the different units:

- **Economic efficiency**—all other things being equal, low-cost emissions reductions are preferable, regardless of how or where they occur.
- **Environmental effectiveness**—units purchased must represent genuine emissions reductions, given they are to be used to offset some of Australia's domestic emissions.
- **Development of an effective global response to climate change**—Australia's purchase strategy should be generally supportive of arrangements and institutions working towards an effective global response to climate change.
- **Consistency with Australia's foreign policy and trade objectives**—units purchased should conform with international rules agreed under the UNFCCC and Kyoto Protocol, and be considered credible internationally.

Australia has joined the second commitment period of the Kyoto Protocol, and will be expected to achieve its 2020 emission reduction goals within that framework. This means Australia can only use the units recognised under the Kyoto Protocol, namely:

- **CERs**—issued under the CDM for emissions reductions that occur in developing countries
- **AAUs**—issued by developed countries who take on a target
- **RMUs**—issued by developed countries for removals of emissions (e.g. through forest sequestration)
- **ERUs**—issued by developed countries for emission reductions that occur under the Joint Implementation Mechanism
- units issued under any market-based mechanism established under the UNFCCC.

This chapter focuses on these Kyoto Protocol-eligible units (for a more detailed assessment, see Appendix B). Australia can use as many of these units as it likes towards meeting its target, provided the international units serve to supplement its domestic action.¹

3.2 CERTIFIED EMISSION REDUCTIONS

CERs are issued under the CDM for emissions reductions that occur in developing countries. In general, the CDM is a credible source of international emissions reductions.

As discussed in Chapter 2, the CDM has operated for many years and has robust systems of review, approval and verification to ensure units issued represent genuine emissions reductions. The CDM's broad coverage across countries, sectors and gases allows access to a range of least-cost opportunities. Thousands of approved projects are operating around the world (see Box 3.1), generating large numbers of CERs that are currently available at very low prices (see Chapter 4). These factors make CERs environmentally and economically attractive.

By reducing costs, market mechanisms such as the CDM can make it easier for countries to take on more ambitious targets, thereby helping to accelerate global action. These kinds of mechanisms could play an increasingly important role in the future and the post-2020 framework is likely to build on existing mechanisms such as the CDM (CCA 2014b).

The wide range of CERs raises some specific issues which are discussed below.

¹ Articles 6, 12 and 17 of the Kyoto Protocol include a requirement that countries' use of the flexibility mechanisms be supplemental to their domestic actions. This means that Australia must take some meaningful domestic action to meet its emissions reduction target and cannot rely solely on trade.

BOX 3.1: CASE STUDIES OF CDM PROJECTS

The CDM covers a large range of emissions reduction activities, including renewable energy, energy efficiency and the destruction of waste coal mine or landfill gas. Some case studies are discussed below.

Household energy efficiency—the Kuyasa CDM project involves retrofitting over 2,300 homes in the district of Khayelitsha, Cape Town, South Africa, with solar water heaters, ceiling insulation and energy-efficient lighting.

Waste heat recovery—the India Cements WHR project involves installing waste heat recovery systems to generate electricity at a cement plant. The electricity generated is used in the manufacture of cement, avoiding more emissions-intensive grid-sourced electricity.

Biogas energy—two CDM projects are helping to deploy an additional 20,000 biogas digesters in households across Nepal. The digesters use the dung from farmers' livestock and domestic latrines to produce methane gas as the organic waste breaks down. The methane is then used as cooking fuel in biogas stoves built directly in the dwellings. This replaces more traditional cooking fuels such as firewood, agricultural residues, animal manure and kerosene.

Small-scale hydro-electricity—the e7 Bhutan Micro Hydro Power Project supplies electricity to the village of Chendebji, from a dedicated 70 kW run-of-river micro hydro-turbine on the edge of the village. Electricity from the turbine is now used in domestic and commercial properties, replacing a range of fuels including wood (cooking, heating, hot water), kerosene (lighting) and diesel (electricity generation).

Wind electricity—the Zafarana Project is a wind power generation project located in Egypt. The wind-generated electricity produced by the project displaces more emissions-intensive grid electricity.

Landfill gas capture—the landfill gas utilisation project at Seelong Sanitary Landfill in Malaysia captures the methane from the landfill that would otherwise have been emitted, and burns it to generate electricity, which displaces more emissions-intensive electricity.

Waste coal mine gas—the Zhongliangshan coal mine methane project in China captures methane that would otherwise have been vented into the atmosphere. Once captured, the methane is used to generate electricity, displacing more emissions-intensive electricity.

Source: UNFCCC 2014

3.2.1 FIRST COMMITMENT PERIOD CERs

First commitment period CERs are issued for emissions reductions that occurred before the end of 2012. About 1.5 billion CERs have been issued; roughly 0.4 billion remain available in the market (see Chapter 4).

These CERs represent genuine, verified emission reductions. They can be used to meet first commitment period targets, and/or be carried over for use in the second commitment period. Units that are not used or carried over will be cancelled at the end of the 'true-up' for the first commitment period, likely to be in 2015. First commitment period CERs therefore present an attractive—but 'use it or lose it'—purchasing opportunity for Australia.

A concern with these units is that buying them will not deliver additional emissions reductions—the reductions have already occurred and if the units are not used they will be cancelled regardless.

On the other hand, if countries such as Australia exclude first commitment period CERs from purchasing programs—in favour of allowing them to be cancelled—it could reduce investor confidence.

The Kyoto Protocol rules restrict the number of first commitment period CERs a country can carry over for use in the second commitment period; for Australia, this limit is 74 million CERs. If Australia purchased more than 74 million units, it could use some towards its first commitment period target. This would 'free up' more of Australia's AAUs (which can be carried over without restriction) for later use. Regulations would need to be made to allow carryover of units in the Australian National Registry of Emissions Units.

First commitment period CERs would be suitable for Australia to use towards its target, but would have to be purchased before the end of the true-up period.

3.2.2 SECOND COMMITMENT PERIOD CERs

Second commitment period CERs are issued for emissions reductions that occur from 1 January 2013. Currently, the number available in the market is limited; more are expected to become available over the period to 2020 (see Chapter 4). These CERs represent genuine, verified emissions reductions, are available at low prices and can be used towards Australia's 2020 target without restriction.

An issue with second commitment period CERs is who gets to count the emissions reduction toward their target. If both Australia and the country selling the CER count it towards their targets, it would be 'double-counted'.

- This problem did not arise in the first commitment period, as only a small set of countries had emissions reduction targets: the developed country buying the CER counted the reduction towards its Kyoto target, and the developing country selling the CER did not have a target.
- In contrast, for the period to 2020 many developing countries have taken on emissions reduction targets and actions. If Australia buys second commitment period CERs, it needs to be satisfied the selling country will not count the same reductions towards its target.

Developing countries have set different types of 2020 goals—some are unilateral (to be met without assistance from other countries), while others are contingent on obtaining financial support (such as the support delivered through the CDM). The accounting rules for these commitments and how they interact with the Kyoto Protocol mechanisms are subject to ongoing negotiation. Until these rules are settled, Australia should only purchase CERs if the emissions reduction will not also be counted towards the selling country's unilateral goals. This would permit use of CERs from:

- developing countries that confirm they will not count the CERs they sell towards meeting their own commitments (this confirmation could be provided in the UNFCCC or through a bilateral agreement)
- CDM projects in developing countries who have taken on commitments that encompass only specific sectors or greenhouse gases, and the project in question reduces emissions in uncovered sectors or gases
- least-developed countries, which are not expected to take significant policy action to reduce emissions without financial assistance.

Australia could consider imposing additional restrictions if it believed some countries were not contributing their fair share of the global mitigation effort. Some high-income countries, for example, are eligible to host CDM projects but have not yet made commitments to reduce their own emissions. Australia could exclude CERs from those countries on the grounds that

an effective global response requires all countries to contribute in accordance with their respective capacities.

3.2.3 RESTRICTING CERTAIN PROJECT TYPES

The CDM covers a wide range of project types, from renewable energy and agricultural waste management to industrial and residential energy efficiency. The only agreed exclusions are nuclear power plants and some land use change and forestry projects. From within this wide scope, individual countries can choose which project types to support.

The CDM's eligibility rules and review processes ensure that, from an environmental perspective, each CER represents a genuine emissions reduction. Generally, maintaining a wide scope of project types—regardless of the type of technology or source of gas—reduces costs. Domestic and foreign policy considerations, however, justify a few specific exceptions.

Forestry projects are credited with temporary CERs that have a limited life; the purchasing country (not the selling country) needs to replace the units when they expire. Australia would face extra costs and risks if it used these units. For this reason, the Authority does not favour temporary CERs.

Large-scale hydro-electric generation projects can significantly reduce emissions compared with fossil-fuel generation. They can also, however, have negative social and environmental impacts, such as displacing local communities, destroying agricultural land and reducing biodiversity. The World Commission on Dams has established a set of criteria for the development of these projects that is widely accepted as documenting good practice. Most large-scale hydro-electric CDM projects meet these criteria, and the EU only accepts CERs from projects that do so. Australia might decide to adopt similar restrictions.

Industrial gas projects destroy industrial gases (such as trifluoromethane (HFC-23), a by-product of HCFC 22 production; and nitrous oxide (N₂O) from adipic acid production) that would otherwise be released into the atmosphere. While these projects achieve genuine emissions reductions, several concerns have been raised:

- Industrial gas projects reduce emissions at very low cost, so are very profitable when carbon prices are high. These profits could create perverse incentives to increase production of HCFC 22, simply to obtain the CER revenue from destroying the HFC-23. The CDM methodology has been amended to largely address these concerns.
- Some countries suggest that funding provided under the Montreal Protocol to phase out HCFC 22 is sufficient to also reduce HFC-23 emissions, so an additional incentive from the CDM is not required.
- The EU has also raised concerns about on-going large wealth and possibly industrial activity transfers from developed to developing countries for this low-cost activity.

The EU has restricted the use of industrial gas CERs and widespread credibility concerns remain.

On balance, the Authority does not favour the use of CERs from projects that destroy HFC-23 and N₂O from adipic acid production.

New coal-fired electricity generation projects are eligible if it can be demonstrated that the project is less emissions-intensive than the plant that would otherwise have been built. These projects raise important competing considerations:

- The primary concern is that, by locking in new emissions-intensive infrastructure, these projects reduce the chance of keeping global average warming below 2 degrees. Many countries, and international financial institutions such as the World Bank, have recently announced they will avoid funding new coal power plants in developing countries for this reason.
- On the other hand, if a more emissions-intensive plant is the only alternative, the project could be used to deliver genuine emissions reductions. The CDM methodology is regularly scrutinised and revised to ensure only genuine reductions are credited. Even so, few projects have been approved and fewer than a million units issued.

Australia could allow certified units of this kind, but these units would not be a priority for any government purchase program.

3.2.4 INVESTING IN EXISTING OR ONLY NEW PROJECTS

A large potential supply of CERs is likely to be available in the period to 2020 from projects that are already registered (approved). The potential supply is much larger than expected demand over the same period. This poses a question as to whether it may be more environmentally effective to purchase CERs only from new projects, and from existing projects that would not continue without an ongoing incentive. Norway's government purchase program, for example, focuses on vulnerable existing projects (those that would not continue without the ongoing incentive) and new projects.

Two main arguments can be made against restricting purchases to only new or vulnerable projects:

- Project developers undertook projects with a reasonable expectation demand would continue for their genuine and verified emissions reductions. If these projects were to be excluded from the market, the developers would require a higher rate of return to compensate for the increased uncertainty, and may be less likely to invest in future projects.
- Restricting the purchase of CERs from existing projects would significantly reduce the potential supply and put upward pressure on prices. While developers are likely to respond to significant new demand, new projects are likely to require a higher price to come to market (see Chapter 4).

On balance, the Authority believes that CERs from both existing and new projects should be allowed to be used to meet Australia's target. This is similar to the government's decision to allow existing Carbon Farming Initiative projects to participate in the ERF.

3.3 ASSIGNED AMOUNT UNITS

Assigned Amount Units (AAUs) are the primary compliance unit under the Kyoto Protocol. Each country with a target issues AAUs equal to its target (essentially its cumulative emission allowance, or budget, for the commitment period). The Kyoto Protocol also allows countries to trade these units.

AAUs are only created by countries—like Australia—who take on binding economy-wide targets under the Kyoto Protocol. Trading units allows countries to meet their collective emissions reduction targets at lower cost than otherwise. The Kyoto rules prevent double-counting—if a country sells an AAU, it cannot use that unit to help meet its own target.

A concern with AAUs is that a country with a weak target can accumulate a large surplus of AAUs it will never use (colloquially called 'hot air'). In the first commitment period, a number of countries had targets far above their actual emissions, creating a large surplus of units. Purchasing these units is unlikely to contribute to global emissions reductions.

Australia, along with a number of other countries, has agreed not to use other countries' surplus first commitment period AAUs toward its second commitment period target, so these units should not be allowed.

Australia could also address these concerns by only allowing second commitment period AAUs from countries with targets it considers sufficiently ambitious—for example, targets comparable to Australia's, taking account of each country's responsibility and capacity. Another option is to tie trade in AAUs to Green Investment Schemes, which require a specific action to reduce greenhouse gases.

3.4 REMOVAL UNITS

Removal Units (RMUs) are issued by countries with a Kyoto Protocol target for each tonne of CO₂ that is removed from the atmosphere (for example, through forest sequestration).

RMUs are generally a robust and attractive option for purchase. They are created only by countries with binding economy-wide targets, and the Kyoto rules prevent double-counting. RMUs are not temporary credits—if the sequestration is reversed in the future, the selling country (that is, the country with the forest) is responsible for the emissions². As a result, RMUs do not create the same risks and costs as temporary CERs from forestry projects in developing countries.

² The rules for the treatment of land sector emissions in the post-2020 period are subject to ongoing negotiation.

First commitment period RMUs cannot be carried over. If Australia were to purchase these units, it could use them to help meet its first commitment period target and carry over additional AAUs instead. RMUs could be used towards its target, if they are available.

3.5 EMISSION REDUCTION UNITS

Emission Reduction Units (ERUs) are issued under the Joint Implementation (JI) mechanism of the Kyoto Protocol. JI is similar to the CDM; it credits emissions reductions at the project level. Because the project occurs in a country with a Kyoto Protocol target, the host country converts an existing AAU or RMU into an ERU to ensure the reduction is only counted once.

In the first commitment period, JI operated with two tracks. Track I units were issued directly by the host country; they were not subject to international review. Track II units were verified by an international body. Countries have agreed to review and streamline the operation of the JI for the second commitment period. The final arrangements are subject to negotiation; however, it is likely JI will operate under a single track.

Many countries participate in JI, creating and purchasing ERUs. A substantial volume of first commitment period ERUs are available in the market, at similar prices to CERs. Second commitment period ERUs are unlikely to be available until negotiations conclude. Carryover limits apply—Australia can only carry over 74 million first commitment period ERUs. If Australia purchases more than 74 million, it would need to use some towards its first commitment period target and carry over additional AAUs instead.

Because the JI allows countries to convert AAUs to ERUs, some Track I ERUs attract the same ‘hot air’ concerns discussed in Section 3.3. Track II ERUs, however, are subject to international oversight and do not raise the same concerns. Further, some countries have established domestic systems, such as Green Investment Schemes, to enhance the environmental integrity of Track I units.

JI has facilitated cooperative action between countries with mitigation commitments as well as direct investment in project-level activity. Market mechanisms of this type will remain an important element of an effective global response to climate change. Using ERUs in the period to 2020 can help to maintain existing market capacity. On balance, Australia could allow first and second commitment period ERUs to be used towards meeting its target.

As with the CDM, JI allows a very wide range of projects, and some of the issues raised earlier may be relevant here also. In particular, ERUs from some large hydro-electricity and industrial gas destruction projects could be excluded, and new coal power plant projects could be given low priority for the reasons discussed in Section 3.2.3. Similarly, there are good reasons to allow ERUs from existing projects. Forestry and other land-based JI projects would also be acceptable given the resulting ERU is permanent.

3.6 NEW MARKET-BASED MECHANISMS

In the second commitment period, countries will be able to use units generated from any new market-based mechanisms established under the UNFCCC to help meet their Kyoto Protocol target. This opens up another potential source of international units for Australia.

While no such mechanisms exist yet, negotiations are underway to establish a ‘new market-based mechanism’ and a ‘framework for various approaches’ that would govern how countries’ individual or joint market-based approaches are recognised.

A large number of potential markets could be captured under these arrangements and be available for Australia to help meet its target. These include units generated under:

- the mechanism for reducing emissions from deforestation and forest degradation (REDD+)
- a mechanism that credits nationally appropriate mitigation action (NAMA crediting)
- emerging emissions trading schemes such as in China and the Republic of Korea.

These mechanisms could be established before 2020. Australia would need to know how these markets are structured and developed before firming up any views about the attractiveness of units from such new market mechanisms.

3.7 SUMMARY OF PURCHASING PRIORITIES

The Kyoto Protocol framework provides a wide range of options for accessing international units to use toward meeting emissions reduction targets.

Table 3.1 summarises the Authority’s current thinking on the types of units available, and the priorities that might be attached.

TABLE 3.1: PURCHASING PRIORITIES FOR AUSTRALIA

Allow	High priority	<p>First commitment period CERs (with the limited exceptions listed below).</p> <p>Second commitment period CERs from projects:</p> <ul style="list-style-type: none"> • in countries that confirm CERs will not be counted towards meeting their own commitments and actions under the UNFCCC • in sectors or for gases not covered by the host country's commitment • in countries that are not expected to take on commitments without assistance such as least developed countries <p>Second commitment period AAUs if satisfied with the stringency of the country's target.</p> <p>First and second commitment period RMUs.</p> <p>First and second commitment period ERUs (with exceptions discussed below).</p>
	Low priority	<p>CERs and ERUs from new coal-fired electricity generation projects.</p>
Assess as they emerge		<p>Second commitment period AAUs and ERUs from green investment schemes.</p> <p>Units from new market mechanisms, including potentially from emerging domestic markets, bilateral offset arrangements, REDD+ and NAMA crediting.</p>
Do not allow		<p>Temporary CERs.</p> <p>CERs and ERUs from:</p> <ul style="list-style-type: none"> • large hydro-electricity projects that do not meet criteria established by the World Commission on Dams • industrial gas destruction projects. <p>First commitment period AAUs.</p>

AVAILABILITY AND COST

4

The supply of international units is forecast to far exceed demand over the period to 2020. As a result, credible emissions reductions are currently trading at historically low prices and are expected to remain available at low prices over the period to 2020.

A decision to use international units to help meet Australia's emissions reductions targets will be informed by the availability and cost of those units. This chapter assesses the supply, demand and price of units considered suitable for Australian use.

The market for international units will evolve over the period to 2020. It will be influenced by progress in international climate negotiations, other countries' decisions on targets and policies, and a range of economic factors including economic growth, fuel prices and technology costs. The Authority has drawn on available analysis from a range of market analysts to form a view on the likely availability and cost of international units suitable for Australia. All of this analysis suggests there will be ample supply of suitable units available at low cost to meet Australia's requirements.

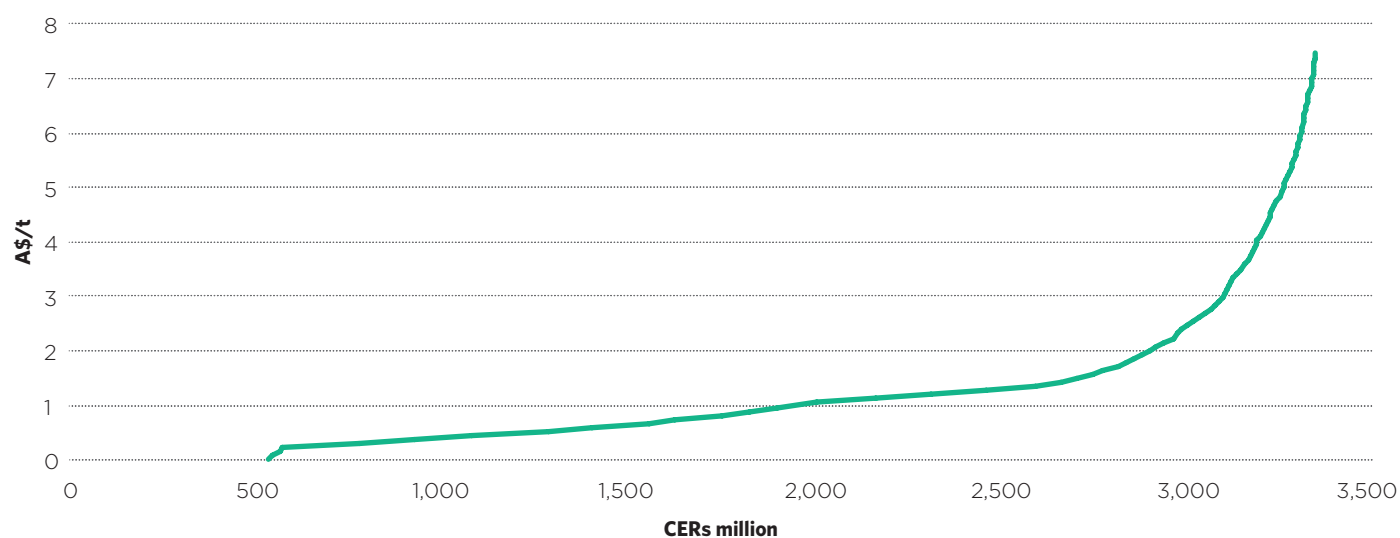
4.1 SUPPLY OF INTERNATIONAL UNITS TO 2020

The CDM and other Kyoto Protocol market mechanisms discussed in Chapter 3 have been operating for a number of years, resulting in a substantial pipeline of units to the market in the future. This section examines that pipeline, focusing on CERs which are likely to dominate supply out to 2020. This chapter excludes other types of units: units from JI and new market mechanisms (because arrangements are still being finalised); AAUs (because their eligibility would require an assessment of the stringency of individual countries' targets); and RMUs (because they are not expected to be available in significant quantities). It follows that the supply of suitable units is likely to be greater than estimated in this analysis.

Estimates of the potential supply of CERs from existing projects in the period to 2020 range between 2 and 4 billion units (BNEF 2014; Vivid 2013; Point Carbon 2014). These estimates include CERs from the first and second commitment periods that have already been issued, and potential future issuance.

Actual supply over the period will depend on prices, issuance rates and project success/failure rates. If prices remain low, many projects will be unable to recover monitoring, auditing and other costs of issuing units. Some projects will also issue fewer credits than they anticipate, and other projects may not continue. The cost of generating units is typically higher for new projects than existing projects. New projects need to recover all project costs including capital, scheme participation, ongoing operating costs, and monitoring and auditing costs. Existing projects need only to recover ongoing operating costs, and monitoring and auditing costs, because other up-front costs have already been incurred.

Figure 4.1 shows one possible supply curve for CERs to 2020, produced by Bloomberg New Energy Finance. Table 4.1 shows the cost of different types of new projects, as estimated by Ecofys and Climatekos.

FIGURE 4.1: POSSIBLE SUPPLY RESPONSE TO RISING PRICES, 2014-20

Note: The Climate Change Authority used the RBA three-month average exchange rate to end May 2014 to convert the BNEF forecast from Euro to Australian dollars.

Source: BNEF 2014

TABLE 4.1: ESTIMATED COSTS OF NEW CDM PROJECTS

PROJECT TYPE	ABATEMENT COST (A\$/t)	TRANSACTION COST (A\$/t)	TOTAL COST PER UNIT (ABATEMENT + TRANSACTION COSTS)
N ₂ O nitric acid	Around 0	0.33-0.41	Around 0.37
Coal mine/bed methane	Around 0	0.33-0.41	0.24-0.37
Energy Efficiency - own generation	Around 0	0.32-0.46	0.37-0.49
Landfill gas	0-4.76	0.40-0.55	0.37-5.25
Hydro large-scale	0-4.76	0.32-0.44	0.37-5.25
Hydro small-scale	0-4.76	0.62-1.10	0.61-5.86
Biomass energy	0-4.76	0.60-0.99	0.61-5.73
Methane avoidance	0-4.76	0.66-1.22	0.61-5.98
Energy Efficiency households	0-4.76	0.71-1.62	0.73-6.34
Wind large-scale	4.76-9.52	1.12-1.93	5.12-10.13
Wind small-scale	4.76-9.52	0.50-1.11	5.86-11.47
Solar	>9.52	0.40-0.60	Above 9.88
Fossil fuel-switching	Estimates vary	0.26-0.29	Estimates vary

Note: Abatement costs include construction, operation and maintenance costs and revenues from the operation of the CDM project. Transaction costs include upfront fixed costs to develop the CDM project design documents, validation, registration, monitoring system establishment costs, and the ongoing costs for monitoring, reporting and verification. The Climate Change Authority used the relevant RBA exchange rates on 3 April 2013 (consistent with the exchange rate calculations in the source) to convert unit costs to Australian dollars.

Source: Ecofys and Climatekos 2013; RBA 2014

In summary, the particular forecasts suggest that the bulk of the potential supply from existing projects would be available at prices of less than \$2, and that many new projects would be able to supply units at prices under \$7. These are, of course, estimates, and would change as underlying assumptions change.

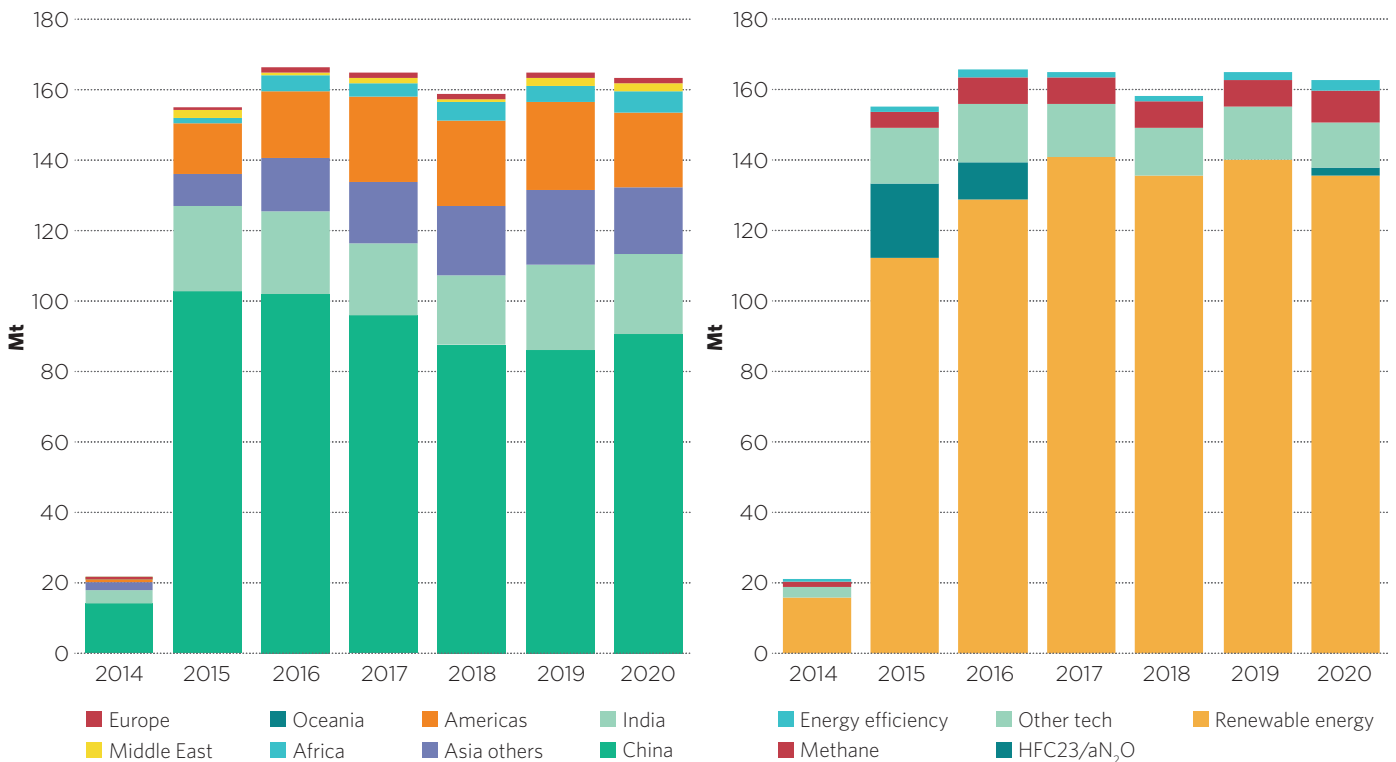
China is expected to be the largest source of the supply from existing projects over the period to 2020, with a growing share from the Americas, India and other countries in Asia (Figure 4.2). CERs from renewables projects are projected to make up the greatest bulk of this supply.

As discussed in Chapter 3, the Authority considers that Australia should exclude some units from the total potential supply. Specifically, the Authority suggests Australia exclude CERs from certain projects, including industrial gas destruction (HFC-23 and N₂O from adipic acid production), some large hydroelectricity projects, and afforestation and reforestation projects (see Section 3.2.3). This is estimated to reduce supply of units from existing projects by around 300 million units over the period to 2020 (BNEF 2014, Vivid 2013), to around 1.5-3.5 billion units.

Chapter 3 also highlighted the importance of ensuring the emissions reductions Australia buys are not also counted by the selling country (see Section 3.2.2). Most countries, including China, have not yet indicated whether they intend to count the emissions reductions underpinning CERs towards meeting their own goals. This concern only relates to second commitment period CERs; first commitment period CERs are suitable for Australia's use. Once positions are clarified, volumes available to Australia would become clearer. If, to avoid the risk of double counting, Australia excluded second commitment period CERs from some of the large supply centres, such as China and the Americas, then this could significantly reduce potential supply from existing projects. Australia may need to source CERs from new projects in other countries where the emissions reductions are not double counted at a higher price.

Assuming that the risks of double counting can be resolved, the potential supply of preferred units from existing projects is estimated to be in the order of 1.5-3.5 billion units. Additional supply of preferred units could be sourced from new projects. This suggests that even when the preferences discussed in Chapter 3 are taken into account, supply is expected to be sufficient over the period to 2020 to meet Australia's needs.

FIGURE 4.2: CER SUPPLY COMPOSITION TO 2020—BY HOST COUNTRY REGION AND TECHNOLOGY



Source: BNEF 2014

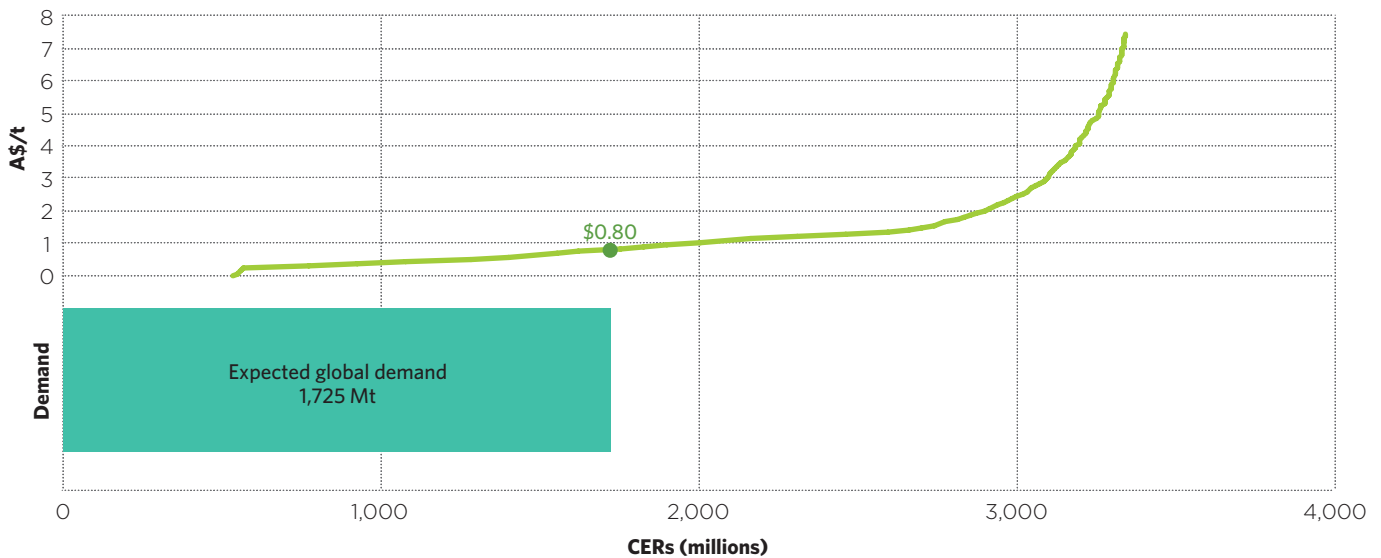
4.2 COMPETING DEMAND AND IMPLICATIONS FOR PRICES

Global demand for international units (excluding any demand from Australia) to 2020 is estimated by some analysts to total between 1.7 and 2.2 billion units (BNEF 2014; Point Carbon 2014), compared with total potential supply from existing projects of between 2 and 4 billion units. These projections include demand from countries with Kyoto Protocol targets and countries using CDM projects to help achieve national commitments outside of the Protocol. The projections also cover demand from both direct government purchase and private sector purchase for compliance with domestic emissions trading schemes (such as the EU ETS and the Chinese pilot schemes). Further sources of demand may emerge as post-2020 international arrangements are finalised.

The price of international units will reflect the balance of supply and demand at particular points in time. Figure 4.3 compares the expected global demand (excluding any Australian demand) with the supply curve discussed in Section 4.1. It suggests that the potential supply of units from existing projects far exceeds projected demand. It also suggests that global demand could need to increase significantly before any appreciable rise in prices.

Each buyer of units will have its own rules for identifying eligible units. European demand will reflect the rules of the EU ETS, as well as Europe-wide rules and individual country preferences. China, the Republic of Korea and South Africa could generate significant demand for use in their domestic emissions trading schemes (demand from these countries would be limited to domestic emissions reduction projects). The resultant different sets of rules could lead to some market segmentation, with different units trading at different prices. CERs from South Africa and the Republic of Korea are, for example, likely to sell at a premium because current supply is insufficient to meet their anticipated domestic demand. Analysts expect that the price of most other CERs will remain low in the period to 2020.

FIGURE 4.3: DEMAND AND SUPPLY BALANCE, 2014-20



Note: The Climate Change Authority used the RBA three-month average exchange rate to end May 2014 to convert BNEF forecast to Australian dollars.

Source: BNEF 2014; RBA 2014

4.3 IMPLICATIONS FOR AUSTRALIA

Supply of international units greatly exceeds current demand. Even if Australia added to this demand by purchasing international units, on the basis of current market forecasts it appears prices would not be significantly affected.

The level of any Australian demand in the period to 2020 would depend on the target the government settles on for 2020 and the level of domestic emissions reductions achievable over that period. Australian demand would be modest, for example, if the minimum 5 per cent target is retained and international units are purchased only to cover any shortfall from domestic efforts. If international units are used to move beyond the 5 per cent target, Australian demand could be more significant but still readily accommodated within projected potential supply.

Some market forecasts suggest that sufficient units to move from a 5 to 19 per cent target (427 million units) could be procured at prices of less than \$1.15 per unit, with a total cost of under \$500 million (Figure 4.4).

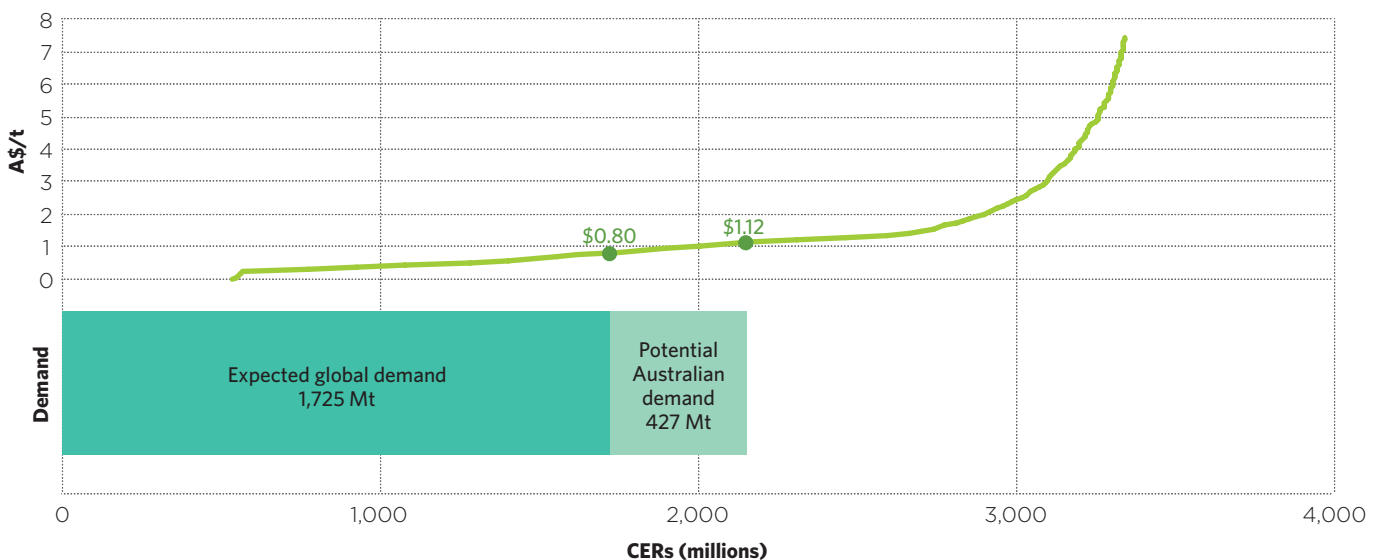
An important caveat to this conclusion is whether countries adequately deal with the risk of double-counting, particularly for large supply sources like China and the Americas. At worst Australia will be limited to first commitment period units, plus units from projects in countries where there is no risk of double counting. This could mean having to source units from new projects in those countries, and having to pay a higher price. The total cost of moving to the 19 per cent target in this worstcase scenario would approach \$3 billion (assuming a price of about \$7 per unit, see Table 4.1).

Predicting future market conditions always involves dealing with uncertainties and risks. Developments that could push up prices include significant unforeseen demand from other countries, and the emergence of periods of illiquidity. Some existing market capacity (including project developers, auditors, traders and lawyers) could also be lost if prices remain very low, reducing the market's responsiveness to new demand. On the other hand new supply could come to market—for example, once arrangements for the JI and new market mechanisms have been finalised.

Early establishment of a government purchasing capability and program early would allow Australia to benefit from current market conditions while having the flexibility to purchase units over time.

Timing considerations are also relevant here if Australia wished to buy first commitment period units. An estimated 383 million of first commitment period CERs and ERUs are currently available (BNEF 2014). As discussed in Chapter 3, these units will be cancelled unless they are used to help meet first commitment period targets, or are carried over into the second commitment period. The compliance process for the first commitment period (called the 'true-up period') is likely to occur in late 2015. Participants in the EU ETS have incentives to purchase most, if not all, of these units by March 2015, the cut-off for converting these units to domestic units in the EU ETS. If Australia wished to buy these units it would seem prudent to do so before March 2015, and essential to do so before true-up. After the true-up period, only second commitment period units will be available.

FIGURE 4.4: PROJECTED CER SUPPLY, DEMAND AND PRICES, 2014-20



Note: The Climate Change Authority used the RBA three-month average exchange rate to end May 2014 to convert BNEF forecast to Australian dollars.

Source: BNEF 2014; RBA 2014

PURCHASING UNITS FOR AUSTRALIA

5

If the government decided to use international units to help meet Australia's emissions reduction targets, it could either buy international units directly through a government purchase program or design domestic policies to encourage the private sector to purchase international units.

Many other countries have government purchase programs, providing possible models for designing and implementing an Australian program. Experience suggests that a government fund would be reasonably straightforward to establish, govern and administer. It would provide a flexible way to help meet Australia's targets at modest costs.

Several countries have designed domestic policies to encourage their private sectors to purchase international units. Each of these countries has clear rules to guide private players on the quantity and type of international units that can be used, as well as on governance matters.

Australia could buy international emissions directly through a government purchase program, design domestic policies to encourage private sector purchases or both. As discussed in Chapter 1, both approaches could be relevant to Australia:

- A government purchase program could establish a 'strategic reserve' of international units for use in the event insufficient domestic reductions were available to achieve the minimum 5 per cent target, or to do better than that minimum target.
- Domestic policies could be designed to allow some businesses to access international emissions reductions as a compliance option in domestic arrangements.

This chapter discusses how these approaches might be implemented, drawing on the experiences of other countries.

5.1 GOVERNMENT PURCHASING

Several governments have established purchase programs to buy international units built around a number of considerations:

- governance
- size of the fund
- administration
- approach to market.

5.1.1 GOVERNANCE

As for any government expenditure program, a fund to purchase international units would require robust governance arrangements.

Various models have been adopted in other countries. Some have established their funds and governance arrangements through specific legislation. Others have established purchase programs through their normal budgetary processes, applying existing public procurement arrangements. Australia could consider both approaches.

In some countries governing boards have been established to oversee the operation of their purchase programs and to advise responsible ministers on funding decisions. This has considerable appeal from a governance perspective.

Most purchase programs have clear objectives to guide the operations of the fund. The majority of funds established in the last decade have focused on purchasing Kyoto Protocol units for compliance with first commitment period targets. Most of the European funds, for example, purchase a variety of Kyoto units primarily for compliance with national or regional Kyoto targets. Some other funds, however, have additional objectives such as broader foreign policy, trade and development. The French Global Environment Facility, for example, has a broad scope, ranging from developmental objectives and providing Official Development Assistance to financing climate change mitigation as well as purchasing units through the CDM and JI, and in REDD+ projects.

The primary objective of an Australian Government fund would be to help meet its 2020 target but other, broader policy objectives could also be considered.

5.1.2 ADMINISTRATION

Program administration involves various functions including financial management, project assessment, risk management, procurement, contract management and market analysis. Some of those activities require specialised skills, while others are more straight-forward.

Many governments have established a dedicated team to administer their programs. The size and skill set of the team depends on whether or not some of the activities are contracted out. The French Global Environment Facility undertakes most of the administration inside of government and employs about 10 full-time staff and an additional 10 experts on its Scientific and Technical Committee. By contrast, the Norwegian program is handled by an internal team of two people and relies more on procuring specialist services from the private sector. Another option is to delegate the administration of the fund entirely to a third party. The Austrian scheme is overseen by an advisory board and the relevant ministry, but is managed by *Kommunalkredit Public Consulting GmbH*, a private sector consultancy.

Many national and multi-national funds have been established which are administered by multilateral institutions including the World Bank and the Asian Development Bank. Participating countries join the fund, provide funding and receive credits in return. These agencies offer significant expertise, experience and high fiduciary standards.

Whether a dedicated team were to be established or much of the administration were to be outsourced, experience suggests administering a government fund is unlikely to be very complicated or resource-intensive.

5.1.3 ACCESS TO MARKET

A purchasing program might access the market through different channels:

- tender
- multilateral fund
- private institution or brokerage service
- exchanges.

The choice of approach depends in part on whether a fund targets the primary market (that is, buys units directly from project developers) or the secondary market (buys units that have already been issued). Again a number of approaches to both primary and secondary markets could be considered, having regard to, among other things, the magnitude of possible purchase and risk management issues.

TENDER

Several government purchase programs have run tender processes that involve calling for proposals and selecting projects based on the best value for money. This is similar to the process proposed for the ERF, where project developers will bid price and volumes to the government.

Tenders are frequently used to source units from the primary market and can be tailored to match any purchasing preferences. They can provide an efficient way for the government to discover a 'market' price of units.

MULTILATERAL FUNDS

Several carbon funds have been established by multilateral banks. Investors in these funds receive units in return for their investment. They have been established for both single and multiple national investors, some have also allowed for private investor participation.

The focus of these funds has reflected the mandates of the administering multilateral agencies to support developing countries. Multilateral agencies have significant institutional capacity to develop and implement emission reduction projects in developing countries. The funds have been directed predominately at new projects and the development of market mechanisms. As they have objectives other than generating credits (such as promoting sustainable development and reducing poverty), the cost of generating units in these funds can be higher than those with specific commercial objectives.

PRIVATE INSTITUTION OR BROKERAGE SERVICES

A number of financial institutions, project aggregators and brokers operate in the market. They offer a range of products (such as spot, forwards and options contracts) to help their customers manage price and delivery risks. They charge a fee for their services or reflect the cost of service in the price of units.

EXCHANGE

Funds can also purchase international units on existing exchanges. These exchanges provide clear price information, reasonable liquidity and a range of products including spot and forward contracts. At present they service predominantly the European market and the units traded reflect the compliance rules in the EU ETS. If Australia was interested in purchasing the same units as those allowed in the EU ETS (with no other preferences or restrictions) purchasing units on these exchanges could be an efficient and straight-forward approach. Exchange-based purchases could be less suitable if Australia wished to purchase a subset of units allowed in the EU ETS.

Exchange prices in the past have been higher than those in the primary market (to account for the lower delivery risk), but are at historically low levels.

5.2 PRIVATE SECTOR PURCHASING

Private sector purchases of international emissions reductions have been a driving force in the development of the global carbon market. The involvement of the private sector has helped to develop risk management arrangements (such as forward contracts and options), to foster experimentation and knowledge transfer, and put pressure on international governance arrangements (such as the CDM Executive Board) to improve their performance. This section looks at how domestic policy might be designed to encourage private sector purchases of international units.

Several countries allow international units to be used by private entities for compliance with domestic policies, including:

- the EU ETS, which gives liable facilities flexibility to use a limited number of international units to meet their compliance obligations
- New Zealand, which provides for international units to be used against obligations under its domestic scheme
- Japan, where businesses purchased international units to achieve their targets in the period to 2012
- South Africa, where the Carbon Tax will allow CERs to be used against liabilities (these are likely to be limited to those generated in South Africa)
- the Republic of Korea and China, which will allow CERs or their equivalent to be used under their proposed emissions trading schemes (like South Africa, these are likely to focus on units generated domestically).

While these policies are designed with specific national circumstances in mind they all seek to lay down clear rules to guide the private sector in respect of:

- quantitative limits—specifying how much of an entity's obligation can be offset by using international units
- unit types—specifying which units the private sector is allowed to use, and those which are not allowed
- acquittal process—transferring units to acquit against the entity's emissions liability, including establishing registries and accounts.

Within these sets of rules, the private entity determines whether they will pursue the opportunity and the units they wish to purchase. The government then counts the international units purchased by the private sector towards the national target. If Australia were to allow for private sector purchases under its policy considerations, it would need to determine how this might best be done and reflected in appropriate rules and processes.

RELEVANT KYOTO PROTOCOL RULES



Australia has joined the second commitment period of the Kyoto Protocol from 2013–20 and will achieve its target in compliance with the Kyoto Protocol rules. This appendix explains these rules. All references to articles and paragraphs refer to the Kyoto Protocol unless otherwise specified.

A.1 KYOTO PROTOCOL COMPLIANCE

To comply with its Kyoto Protocol obligations, at the end of the second commitment period Australia will need to 'retire' enough Kyoto units to match its greenhouse gas emissions over the period 2013–20.

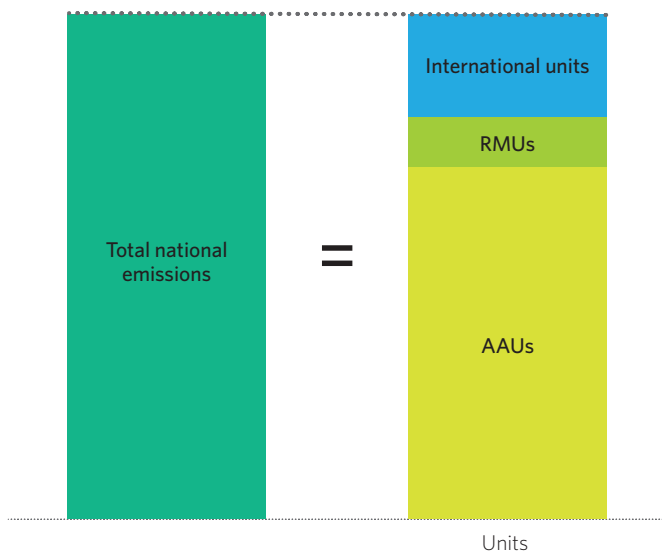
Australia was assigned an initial carbon budget, equal to its Kyoto target, at the start of the commitment period (art. 3, para. 1). Australia is able to create Assigned Amount Units (AAUs) equal to this budget, with each AAU representing one tonne of emissions. After 2020, it can retire these units for compliance.

As well as these AAUs, Kyoto rules allow Australia to use other units for compliance, including:

- **Removal Units** (RMUs)—if Australia achieves removals of emissions (for example, through storing carbon in forests: UNFCCC, Dec 13/CMP.1), it can issue RMUs and use these for compliance (see A.7). Australia can also use RMUs issued by other countries.
- **AAUs** from other countries (art. 17) (see A.4).
- **Certified Emission Reductions** (CERs) issued under the Clean Development Mechanism (art. 12).
- **Emission Reduction Units** (ERUs) issued under the Joint Implementation Mechanism (art. 6).
- **Units issued under a market-based mechanism** established under the UNFCCC (see A.5).

If Australia's domestic emissions exceed its second commitment period target, it can still comply with its obligation by purchasing units. In this case, the additional emissions in Australia are offset by emissions reductions elsewhere. Similarly, if Australia sells units to other countries, it cannot use those units to meet its own target.

All units must be tracked using the Kyoto Protocol's integrated electronic registry system. Countries use this system to issue, transfer, retire (for compliance) and cancel units. Kyoto Protocol compliance is illustrated in Figure A.1.

FIGURE A.1: KYOTO PROTOCOL COMPLIANCE

A.2 TRUE-UP PERIOD

Kyoto rules define what happens after the commitment period ends. First, countries are given time to finalise their emissions inventory reporting. Inventory reports are submitted with a two-year delay and are subject to international review (UNFCCC, Dec 15/CMP.1). Australia submitted its final inventory report for the first commitment period on 15 April 2014.

Once all Parties' final inventory reports have been reviewed, Parties will have a 100-day period ('true-up period') to get things in order and retire the right amount of units for compliance. Countries can continue to trade in this period.

The timing of the true-up period is important because it determines the timing of carryover, which in turn has implications for the availability of units (see A.3). Timing needs to be agreed by Parties to the UNFCCC and has not yet been decided. Most analysts consider the earliest the true-up period could start is mid-2015 and, if Parties do not decide on timing at the Lima meeting in November 2014, it would be delayed to at least 2016.

A.3 CARRYOVER RULES

Under the Kyoto Protocol, Australia can carry over to the second commitment period certain Kyoto units that have not been retired for compliance with the first commitment period. Different units are subject to different carryover restrictions (Dec 13/CMP.1):

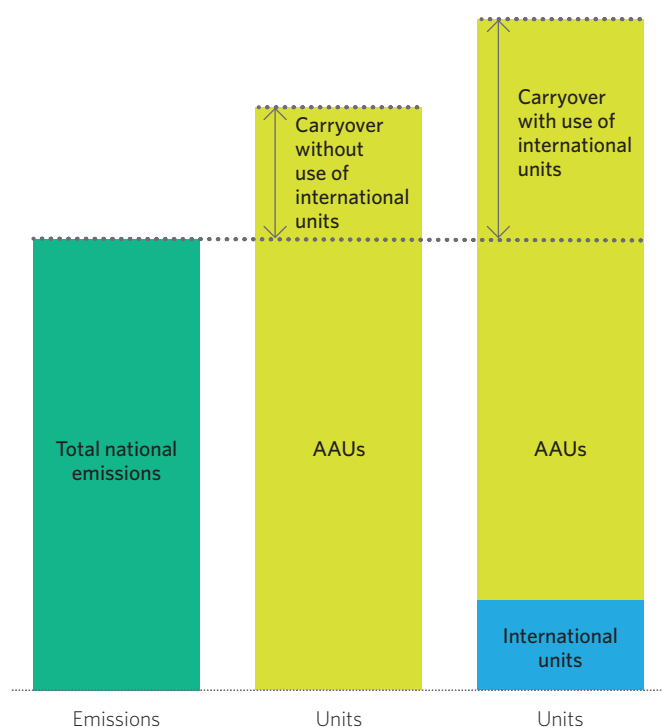
- AAUs (whether Australia's surplus or bought from another country) can be carried over without restriction (see A.4).
- CERs can be carried over up to a maximum of 2.5 per cent of Australia's initial assigned amount for the first commitment period (equivalent to 74 million units)
- ERUs can be carried over up to a maximum of 2.5 per cent of Australia's initial assigned amount (74 million units).
- RMUs, ERUs converted from RMUs and temporary CERs (issued for forestry projects under the CDM) cannot be carried over.

At the end of the true-up period, Australia will submit a report confirming what units it proposes to carry over. This report will be subject to international review.

Carryover, like all other Kyoto Protocol transactions, is recorded in the integrated electronic registry system. The first commitment period units Australia elects to carry over will be converted into second commitment period units. Any first commitment period units that are not carried over are cancelled.

The rules for compliance in the first commitment period, true-up and carryover are a window of opportunity for Australia. Provided that the volume is available, Australia could purchase first commitment period units such as CERs, ERUs or RMUs before the end of true-up and retire them for compliance towards its first commitment period target. This would increase the number of AAUs that Australia could carry over and use towards its second commitment period target (Figure A.2 illustrates). From an environmental perspective, this is robust—provided that all units purchased represent genuine emissions reductions.

FIGURE A.2: COMPLIANCE, TRUE-UP AND CARRYOVER RESTRICTIONS



A.4 USE OF SURPLUS AAUs

Once carried over, there is no restriction on using Australia's own AAUs to meet its 2020 target. Parties have, however, agreed to some trade constraints for surplus AAUs from the first commitment period. This was in response to concerns about the large surplus of AAUs ('hot air') that many countries are expected to have (Chapter 3). The arrangements will also apply to Australia's surplus.

For each country, AAUs that are carried over from the first commitment period will be placed in a special account in the registry called the 'previous period surplus reserve account'. Australia will be able to use these AAUs without restriction towards its second commitment period target (Dec 1/CMP.8 para. 24).

Parties can buy other countries' previous period surplus AAUs in the second commitment period, but only to a limit of 2 per cent of their assigned amount from the first commitment period (Dec 1/CMP.8 para. 26).

When the new rules were agreed in 2012, Australia made a political declaration that it would not purchase surplus AAUs carried over by other countries. Japan, Liechtenstein, Monaco, Norway and Switzerland made similar statements, and these AAUs cannot be used for compliance under the EU's legislation.

The 2012 amendments to the Kyoto Protocol also contained a safeguard to avoid creating new surpluses of AAUs in the second commitment period (new hot air) (art. 3 para. 7 ter). This safeguard forces countries with second commitment period targets weaker than the threshold (their average emissions in 2008-10) to cancel AAUs. In effect, this means their second commitment period target cannot exceed this threshold. This improves the environmental integrity of AAUs in the second commitment period.

A.5 NEW MARKET MECHANISMS

When the second commitment period was agreed in 2012, several amendments to the Kyoto Protocol were also adopted. One allows for countries with a Kyoto Protocol target to use units generated under a market-based mechanism established under the UNFCCC towards meeting their second commitment period targets (art. 3 para. 12 bis-ter). The rules for these new market mechanisms are still under negotiation.

A.6 SHARE OF PROCEEDS

The Kyoto Protocol rules require 2 per cent of CERs generated from each CDM project to be provided to the Adaptation Fund, which sells the units and uses the proceeds to assist vulnerable developing countries' adaptation projects. This 'share of proceeds' occurs at the point of issuance and the cost is reflected in the price of remaining CERs sold on the market.

In the second commitment period, a similar 'share of proceeds' has been agreed for the transfers of other Kyoto Protocol units (Dec. 1/CMP.8 para. 20). This means that if Australia was to buy second commitment period ERUs, RMUs or AAUs, 2 per cent of the units transferred would need to be provided to the Adaptation Fund. This is only required for the first international transfer of the units and not for subsequent transfers.

These rules would need to be taken into account when purchasing units for the second commitment period.

A.7 LAND USE ACCOUNTING

To meet Kyoto Protocol targets, countries must count net emissions from some types of land use activities (including, for the second commitment period, forest management) and can opt to count others (revegetation, cropland management, grazing land management, and wetland drainage and rewetting).

For removals such as those from afforestation, reforestation and forest management, countries issue an RMU. There is a limit on the number of forest management RMUs a country can use toward its second commitment period target (3.5 per cent of 1990 emissions, excluding land use, land use change and forestry, multiplied by eight) (Dec. 2/CMP.7, Annex D para. 13). This limit applies to forest management RMUs issued by Australia, as well as any forest management RMUs acquired from other countries.

There is also a limit on the number of CERs from afforestation and reforestation projects that can be used (1 per cent of 1990 emissions, excluding land use, land use change and forestry, multiplied by eight) (Dec. 2/CMP.7, Annex D para. 19).

ASSESSMENT OF DIFFERENT TYPES OF UNITS



This appendix sets out analysis and conclusions about different international units; it complements the discussion in Chapter 3.

CERTIFIED EMISSION REDUCTIONS (CERs)		
CERs are issued under the CDM for emissions reductions that occur in developing countries.		
Principle	Analysis	Conclusion
Economic efficiency	The wide coverage of the CDM, across a large number of countries, sectors and gases, allows for low-cost abatement to be sourced. The mechanism has been operating for some time and the market is now well established. There is a large number of CERs available in the market at historically low prices, currently below \$0.50 (see Chapter 4). They represent a cost-effective option to help achieve Australia's target.	Allow (subject to some exceptions discussed below)
Environmental effectiveness	The CDM has detailed rules and governance arrangements to ensure emissions reductions are genuine. Over time, the CDM has developed a sophisticated set of methodologies and rules for determining whether reductions are additional and these are constantly refined. Its operation has improved over time, and its Executive Board has made a conscious and consistent effort to identify and address environmental credibility concerns. It now operates with a high level of environmental integrity. Similar governance arrangements and verification processes are employed in Australia's CFI and are proposed for the ERF.	
Effective global response	Market mechanisms such as the CDM allow for lowest-cost emissions reductions to be sourced regardless of where in the world they occur. In this way, markets can promote and enable increased global action as individual countries can take on more ambitious targets at lower cost. Using CERs to contribute to Australia's 2020 goals would help maintain market capacity and confidence, and demonstrate the mutual benefits trade can provide to both buying and selling countries.	
Foreign policy and trade objectives	CERs are consistent with Australia's foreign policy and trade objectives. They count towards Australia's target under the Kyoto Protocol rules, and their use by Australia would generally be considered credible internationally.	

FIRST COMMITMENT PERIOD CERs

First commitment period CERs are issued for emissions reductions that occurred before the end of 2012.

Principle	Analysis	Conclusion
Economic efficiency	There is currently a large number of first commitment period CERs available in the market. Their availability and cost will depend on demand from other countries (see Chapter 4).	Allow
Environmental effectiveness	First commitment period CERs represent genuine verified emissions reductions. It could be argued that they do not represent 'additional' emissions reductions, as the reductions have already occurred and, if Australia doesn't buy them, they will be cancelled at the end of the true-up.	
Effective global response	Restricting the purchase of these first commitment period CERs would likely undermine investor confidence in the CDM, other market-based approaches and other clean investment schemes. This would not be consistent with supporting an effective global response to climate change.	
Foreign policy and trade objectives	First commitment period CERs can be used towards Australia's second commitment period target if they have been carried over. There is a limit on carryover equivalent to 74 million CERs for Australia. If Australia wants to purchase more than 74 million first commitment period CERs, it could retire them in place of AAUs against its first commitment period target and increase the number of AAUs that can be carried over (see Appendix A).	

SECOND COMMITMENT PERIOD CERs

Second commitment period CERs are issued for emissions reductions that occur from 1 January 2013.

Principle	Analysis	Conclusion
Economic efficiency	Currently, there is a limited number of second commitment period CERs available in the market at low prices. More are expected to become available over the period to 2020 at prices below \$1.15 (see Chapter 4).	Allow from projects in:
Environmental effectiveness	<p>The CDM general rules provide primary assurance of the environmental integrity of CERs. However, in some cases the national goals to reduce emissions in host countries could affect additionality.</p> <p>In the period 2013 to 2020, many developing countries have taken on commitments or actions to reduce their emissions under the UNFCCC. These commitments have many different forms—some are unilateral; others are contingent on financial support (such as the support delivered through mechanisms like the CDM).</p> <p>The rules for how to account for these commitments and how they interact with the Kyoto Protocol mechanisms are subject to ongoing negotiation. To be additional and avoid double-counting, Australia can only use CERs where the same emissions reduction is not counted towards the developing country's unilateral emissions reduction goals.</p> <p>Until there is greater clarity on how second commitment period CERs are to be counted, additional filters on the CERs Australia can purchase may be required to ensure they represent an additional emissions reduction:</p> <ul style="list-style-type: none"> • Where developing countries confirm that they will not count CERs towards meeting their own commitments, the CERs would be additional. • Where developing countries have taken on commitments that encompass only specific sectors or greenhouse gases, CERs from projects in uncovered sectors or gases would be additional. • Least-developed countries may not have commitments or be expected to take action without financial assistance. CERs from projects in these countries would be additional. 	<ul style="list-style-type: none"> • countries that confirm the CERs they sell will not be counted towards meeting their own commitments and actions under the UNFCCC • sectors or for gases not covered by the host country's commitment • countries that are not expected to take on commitment without assistance, such as least-developed countries
Effective global response	Some countries that are eligible to host CDM projects are not really 'developing' because they have high incomes but do not yet have a commitment under the UNFCCC. The CERs from projects in these countries would, strictly speaking, be additional. Purchasing these units would not, however, be consistent with Australia's foreign policy objectives or an effective global response, as these countries can reasonably be expected to take on commitments.	
Foreign policy and trade objectives	Second commitment period CERs can be used towards Australia's target under the Kyoto Protocol and would be considered credible internationally.	

TEMPORARY CERs (FIRST AND SECOND COMMITMENT PERIOD)

Forestry projects are credited with temporary CERs (called tCERs and ICERs) that have a limited life.

Principle	Analysis	Conclusion
Economic efficiency	<p>There are very few forestry CERs available on the market.</p> <p>The purchasing country (not the forestry host country) would need to replace the units when they expire or if there is a reversal of the carbon storage (for example, if the forest was destroyed). This buyer liability model creates extra risks for Australia. It also makes administering either a government purchase program or domestic policy more complicated, as the requirement to replace the CER would need to be tracked.</p>	Do not allow
Environmental effectiveness	Temporary CERs are environmentally credible because, like other CERs, they are only issued for verified abatement from approved forest projects.	
Effective global response	There is widespread acceptance of the role that land sector abatement will need to play in a carbon-constrained world. Under the CDM, this abatement is facilitated through the issue of temporary CERs.	
Foreign policy and trade objectives	Temporary CERs can be used towards Australia's target under the Kyoto Protocol and would be considered credible by some countries. First commitment period temporary CERs cannot be carried over. If Australia uses second commitment period temporary CERs, they would need to be replaced consistent with the Kyoto Protocol rules.	

LARGE-SCALE HYDRO-ELECTRIC GENERATION PROJECTS (FIRST AND SECOND COMMITMENT PERIOD)

Principle	Analysis	Conclusion
Economic efficiency	There is significant potential supply from large hydro-electric generation projects, which are likely to be low cost.	Do not allow unless the project meets criteria established by the World Commission on Dams
Environmental effectiveness	Large-scale hydro-electric generation projects can significantly reduce emissions compared to fossil-fuel generation. They can also displace local communities, and lead to loss of agricultural land and a decline in biodiversity. The World Commission on Dams has established a set of criteria for the development of these projects that is widely accepted as good practice. Most large hydro-electric CDM projects meet these criteria.	
Effective global response	Hydro-electric generation has a role in an effective global response to climate change.	
Foreign policy and trade objectives	The EU only accepts CERs from hydro-electric projects that meet the criteria. If Australia was to purchase CERs from hydro-electric CDM projects without similar restrictions, it could be criticised internationally.	

INDUSTRIAL GAS DESTRUCTION PROJECTS (FIRST AND SECOND COMMITMENT PERIOD)

 A large number of CERs issued to date have come from projects that destroy industrial gases—trifluoromethane (HFC-23) and nitrous oxide (N₂O) from adipic acid production—that would have otherwise been released into the atmosphere.

Principle	Analysis	Conclusion
Economic efficiency	<p>The cost of reducing HFC-23 and N₂O emissions is very low. Some controversy around these projects relates to the large profit that projects received in the past, given the low cost of the emissions reductions compared to the CER price received at the time. European entities in particular transferred significant wealth to projects in developing countries.</p> <p>Europe and other developed countries fund the phase-out of HCFC 22 under the Montreal Protocol. This, in turn, reduces the associated HFC-23. Some argue that an additional incentive from the CDM is therefore not required.</p> <p>There is also some concern that the high rates of return for CDM projects has shifted production of adipic acid offshore to developing countries because the treatment under the CDM is much more favourable than in Europe.</p>	Do not allow
Environmental effectiveness	<p>These projects achieved real emissions reductions but there are widespread credibility concerns. The EU, for example, has restricted the use of CERs from these projects.</p> <p>Initially concerns were raised with projects that destroy HFC-23 (which is a by-product of HCFC-22, controlled under the Montreal Protocol established to protect the ozone layer). Later, similar concerns were raised with projects that destroy N₂O from adipic acid production.</p> <p>Concerns centre on the perverse incentive to produce more HCFC-22 just to get the CERs from destroying the HFC23. The methodology has been amended to largely address these concerns.</p>	
Effective global response	These gases have high global warming potential and so an effective global response would provide incentives for these emissions to be reduced. Some consider that developing countries should act to reduce these emissions without the incentive from the CDM because the cost of the reduction is so low.	
Foreign policy and trade objectives	While emissions reductions from these projects are real, they are widely perceived as not credible. If Australia was to purchase these, it could be criticised internationally and domestically, and may also increase scepticism about international units.	

NEW COAL-FIRED ELECTRICITY PROJECTS (FIRST AND SECOND COMMITMENT PERIOD)

The CDM credits new coal-fired electricity generators if it can be demonstrated that the generator is less emissions-intensive than the fossil-fuel plant that would have been built instead. This project type does not incorporate fossil-fuel electricity generators that deploy carbon capture and storage (CCS).

Principle	Analysis	Conclusion
Economic efficiency	These units make up only a very small proportion of the total potential supply. Currently, six projects of this type have been registered (approved)—five in India and one in China. To date, 606,306 CERs have been issued from these projects. There are an additional 55 projects in the pipeline but many are unlikely to be eligible under the most recent methodology. These CERs are unlikely to be available at a lower cost than other CERs.	Under a government purchase program, place a low priority on buying units
Environmental effectiveness	There have been concerns with the methodology for these projects—some argue the financial and common practice tests used to demonstrate additionality are not sufficient, and default factors used in setting the baseline might over-credit some projects (Lazarus and Chandler 2011). The methodology has been reviewed by the CDM Executive Board several times. The latest version has more stringent additionality tests and baselines than previous versions. Many other CDM projects use similar additionality tests and approaches to setting baselines.	
Effective global response	By locking in new emissions-intensive infrastructure, these projects reduce the chance of keeping global average warming to below 2 degrees. Many countries, as well as international financial institutions such as the World Bank, have recently announced they will avoid funding new coal power plants in developing countries for similar reasons. The premise of the CDM methodology is that a long-lived fossil-fuel power plant is going to be built in any event but, with support from the CDM, a less emissions-intensive plant can be built instead. The CDM does not assess any projects on the basis of whether the investment is consistent with a less-than-2-degrees-future; rather, it assesses if emissions will be lower than they otherwise would be.	
Foreign policy and trade objectives	It is possible that those countries hosting projects would criticise the restriction, potentially reducing Australia's influence. Australia is also an exporter of coal and does not prohibit fossil-fuel generation domestically. In practice, the low number of units from this source means that they could not make a large contribution to any purchasing strategy in Australia.	

INVESTING IN EXISTING OR ONLY NEW PROJECTS

There is a large potential supply of CERs in the period to 2020 from projects that are already registered (approved). This potential supply is much larger than expected demand over the same period. Without additional demand, it is unlikely that many new projects would be developed.

Principle	Analysis	Conclusion
Economic efficiency	Excluding CERs from existing projects would significantly reduce the potential supply and likely increase the price. There are very few new projects currently requesting registration. This mostly reflects a lack of demand. If Australia demanded units from new projects, then project developers would likely respond. New projects are likely to require a price higher than some existing projects to come to market (see Chapter 4).	Allow from both existing and new projects
Environmental effectiveness	Some of the existing projects, but not all, will continue without an on-going incentive from the CDM. It could be argued that it would be more environmentally effective to purchase CERs from new projects only, or to only purchase CERs from projects that will continue without an on-going incentive.	
Effective global response	Investors undertook existing projects with the reasonable expectation of market demand for their verified emissions reductions. Reassessing whether the project needs an on-going incentive after the investment has already been made would weaken market confidence, with investors less likely to invest again (or requiring a higher rate of return on new investments). This would not be consistent with an effective global response to climate change, which requires substantial investment.	
Foreign policy and trade objectives	Kyoto Protocol rules allow for Australia to use CERs from both existing and new projects. It is unlikely that Australia would be criticised for using CERs from existing projects.	

PRIORITISING PROJECTS TO ACHIEVE BROADER FOREIGN, TRADE OR DEVELOPMENT OBJECTIVES (FIRST AND SECOND COMMITMENT PERIOD)

Units from projects that enhance Australia's trade, foreign policy and development objectives could be prioritised.

Principle	Analysis	Conclusion
Economic efficiency	If Australia only allows units from projects that also enhance its broader foreign, trade or development objectives, it could reduce supply and increase costs. If the broader policy objectives can be achieved through the carbon market in a cost-effective way, targets purchasing rules could be a good way to meet Australia's mitigation and other objectives at the same time. If, however, there are other, cheaper, options, it would be more economically efficient to have more open purchasing rules.	Under a government purchase program, prioritise units from projects that enhance Australia's broader foreign, trade and development policy objectives where they can be sourced at a cost similar to other units
Environmental effectiveness	No specific concerns; could prioritise projects that deliver multiple environmental benefits.	
Effective global response	An effective global response from climate change is more likely to be achieved if cooperation to address climate change can also enhance other objectives.	
Foreign policy and trade objectives	Purchasing units from projects in specific countries could enhance Australia's broader trade, foreign policy and development objectives. For example, Australia could allow units from projects located in neighbouring countries that are a particular focus of its development agenda; that use technology, inputs or skills exported from Australia; or that are owned by Australian developers.	

ASSIGNED AMOUNT UNITS (AAUs)

AAUs are the primary compliance unit under the Kyoto Protocol. Trade in AAUs could also allow Australia to use units generated in domestic markets of other Kyoto Protocol countries, where those domestic units are backed by an AAU.

Principle	Analysis	Conclusion
Economic efficiency	There is a large volume of first commitment period AAUs that will not be used for compliance and can be carried over for use in the second commitment period. There may also be some second commitment period AAUs available in the period to 2020. It is unlikely that AAUs would be available at prices below other units.	Do not allow first commitment period AAUs Allow second commitment period AAUs if satisfied with the stringency of the country's target
Environmental effectiveness	<p>There are environmental credibility concerns associated with the large volume of surplus AAUs, particularly from countries with economies in transition whose first commitment period targets were significantly above their business-as-usual emissions (referred to as 'hot air'). Purchasing these units would not necessarily lead to an additional emissions reduction in the other country.</p> <p>It is not yet clear if the same credibility concerns will arise with the second commitment period AAUs.</p> <p>In the past, some countries have addressed the credibility concerns associated with AAU trades by funding green investment. Some of these schemes are similar to Australia's Emissions Reduction Fund, but instead of investing in domestic projects the schemes invested in projects located in other countries (Tuerk et al. 2013). Similar investment schemes could emerge for the second commitment period and provide a credible way for Australia to source AAUs.</p> <p>Where trade in AAUs is linked to a credible domestic market in another country, it would be environmentally credible. For example, EUAs are very credible, with the EU ETS having a binding cap and robust monitoring and verification procedures.</p>	
Effective global response	Trade in AAUs could help support an effective global response to climate change. Trade in emissions reductions between countries that have economy-wide emissions budgets will be an important element of the post-2020 framework, because it allows countries flexibility to cooperate and find the lowest-cost emissions reductions. Trade in AAUs is how this same flexibility can be achieved under the Kyoto Protocol.	
Foreign policy and trade objectives	First commitment period AAUs count towards Australia's target under the Kyoto Protocol rules; however, use by Australia would generally not be considered credible internationally. Australia has made a political declaration that it would not use other countries' surplus AAUs from the first commitment period towards meeting its second commitment period target (see Appendix A).	

REMOVAL UNITS (RMUs)

RMUs are issued by countries with a Kyoto Protocol target for each tonne of CO₂ that is removed from the atmosphere. RMUs can also be traded to other countries.

Principle	Analysis	Conclusion
Economic efficiency	There are not many RMUs available on the market, but some could become available. They could be economically efficient if they are available for prices similar to other low-cost units.	Allow
Environmental effectiveness	RMUs are environmentally effective. Some concerns have been raised about the robustness of land sector accounting and the permanence of sequestration. The measurement and reporting of land sector emissions, however, is part of the Kyoto Protocol compliance process. The lack of permanence is dealt with in subsequent periods, with emissions counted in the selling country's emissions inventory.	
Effective global response	There is widespread acceptance of the role the land sector will play in a carbon-constrained world. Trade can facilitate this abatement, and trade in RMUs is how this is achieved under the Kyoto Protocol.	
Foreign policy and trade objectives	RMUs count towards Australia's target under the Kyoto Protocol rules and their use by Australia would generally be considered credible internationally despite them being excluded from the EU ETS. However, first commitment period RMUs cannot be carried over, so if Australia wanted to use them it would need to purchase them before the end of the true-up period and use them for compliance in the first commitment period (Appendix A). In the second commitment period, Australia would need to stay within the limit on the use of RMUs from forest management activities.	

EMISSION REDUCTION UNITS (ERUs)

ERUs are issued under the Joint Implementation (JI) mechanism. JI allows a country with a Kyoto Protocol target (or an entity it approves) to implement an emissions reduction project in another country that also has a target, and to trade the resulting ERUs for use towards its target.

Principle	Analysis	Conclusion
Economic efficiency	From an economic perspective, there is a number of first commitment period ERUs available in the market. These units trade at similar prices to CERs. Rules for JI in the second commitment period are still under negotiation.	Allow first commitment period ERUs and second commitment period ERUs when they are available, with the following exceptions:
Environmental effectiveness	<p>In the first commitment period JI operated with two tracks. Track I allows the host country to verify emissions reductions itself using its own procedures. Under Track II, emissions reductions are verified under the supervision of an international body called the Joint Implementation Supervisory Committee (JISC). The ultimate decision about whether to issue the ERU is made by the host country.</p> <p>As with AAUs, there could be some environmental credibility concerns with Track I ERUs because those countries with a large surplus of AAUs could declare a project has reduced emissions, without any real additional emissions reduction. JI projects approved under Track II have not faced the same credibility concerns because their verification is subject to international oversight.</p> <p>Most countries who have participated in the JI have developed processes and programs that provide a degree of environmental integrity. Some use methodologies and procedures that are similar to those under Track II. Green investment schemes have also been used to develop and fund JI projects of high quality.</p> <p>The Parties have agreed to review the operation of the JI for the second commitment period with the intention to streamline the mechanism to operate under a single track, align accreditation of auditors with arrangements under the CDM, and specify mandatory requirements for assessing additionality and approving baselines of projects. The final arrangements for the JI in the second commitment period as well as transitional arrangements are subject to ongoing negotiation.</p> <p>As with the CDM, there are some particular types of JI projects that may not be credible sources of units. The same assessment would apply to large hydro-electricity, industrial gas destruction and new coal-fired power plants, and investment in existing projects. Forestry and other land-based JI projects would be acceptable as the resulting ERU is not temporary (unlike forestry CERs).</p>	<ul style="list-style-type: none"> ERUs from large hydro-electric projects, unless they meet the criteria established by the World Commission on Dams ERUs from projects that destroy HFC-23 and N₂O from adipic acid production <p>Under a government purchase program, a low priority should be placed on ERUs from new fossil-fuel projects</p>
Effective global response	JI facilitates cooperative action between two countries that have mitigation commitments. Market mechanisms of this type will be an important element of an effective global response to climate change. Supporting the JI by using ERUs in the period to 2020 can help to maintain existing market capacity that will remain valuable post-2020.	
Foreign policy and trade objectives	ERUs count towards Australia's target under the Kyoto Protocol rules and use by Australia would generally be considered credible internationally. Australia can only carry over 74 million ERUs. If it purchases more first commitment period ERUs it could use them towards its first commitment period target.	

SUMMARY OF OTHER COUNTRIES' RESTRICTIONS AND PREFERENCES



This appendix provides background information on purchasing programs for international units from around the world. These encompass a range of schemes that permit international unit purchases, government purchase programs and carbon funds operated by multilateral agencies.

COUNTRY/FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
European Union Emissions Trading Scheme (EU ETS)—multilateral scheme	<p>The EU ETS is the largest emissions trading scheme in the world and has been operating since 2005. Its objective is to reduce the emissions from EU member states by setting an absolute limit on emissions. This 'cap' covers around 50 per cent of EU-wide emissions—about 11,000 factories, power stations and other installations with a net heat excess of 20 MW in all 28 EU member states plus Iceland, Norway and Liechtenstein.</p> <p>The EU ETS allows liable operators to use a limited number of eligible flexibility mechanisms to meet their compliance obligations. (CERs from the CDM and ERUs from JI).</p> <p>Operators used 1.058 billion international credits in the period 2005 to 2012, with about 500 million more expected to be used for the period 2013–20.</p>	<p>The EU ETS Directive is set in legislation agreed by the European Parliament. The majority of rules guiding the operation of the EU ETS are set out in Directives that are agreed by the European Parliament and the European Union Member States.</p> <p>The European Commission administers the scheme, including operational matters such as proposing registry rules, issuing allowances and other provisions.</p>	<p>The EU ETS imposed several qualitative restrictions on international units used for compliance. In previous phases of the EU ETS, the following project types were:</p> <ul style="list-style-type: none"> • nuclear • agriculture and land use, land use change and forestry • hydropower generation where generation capacity exceeds 20 MW and is not consistent with the World Commission on Dams • RMU units, temporary CERs (tCER) or long-term CERs (ICER). <p>From 2013, additional restrictions were placed on projects involving:</p> <ul style="list-style-type: none"> • Trifluoromethane (HFC-23) • Nitrous oxide (N₂O) emissions from adipic acid production. <p>There are additional restrictions in the third phase of the EU ETS (from 2013 to 2020)—the only units allowed are:</p> <ul style="list-style-type: none"> • existing CDM projects that were eligible in the previous phase, and were registered by 31 December 2012 • new CDM projects that are undertaken in least developed countries (LDCs) or small island developing states, and were registered after 31 December 2012 • Track II JI projects from countries with an emissions reduction target under the second commitment period of the Kyoto Protocol.

Sources: Kollmuss, A et al, 2010; European Commission 2014; European Environment Agency 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
European Union Effort Sharing Decision—multilateral scheme	<p>The Effort Sharing Decision establishes binding annual greenhouse gas emission targets for EU member states for the period 2013–20. It covers most sectors not included in the EU ETS, including transport (except aviation and international maritime shipping), buildings, agriculture and waste. The Effort Sharing Decision allows governments to use CDM and JI units for compliance, to an annual limit up to 3 per cent of their annual emissions in 2005.</p> <p>The Effort Sharing Decision allows certain member states to use an additional 1 per cent of credits from LDCs or Small Island Developing States. The member states concerned are Austria, Finland, Denmark, Italy, Spain, Belgium, Luxembourg, Portugal, Ireland, Slovenia, Cyprus and Sweden.</p> <p>Total emissions for the EU 27 in 2005 were 5,177 Mt CO₂-e. This means EU governments can access approximately 153 Mt CO₂-e of CDM and JI units annually for compliance with the EU Effort Share.</p>	<p>Directives for the Effort Sharing Decision are agreed by the parliament and administered by the European Commission. The Commission proposes rules, undertakes reviews and provides a range of operational support but allows member states ultimate flexibility to determine how they achieve their target.</p> <p>Member states meet their own targets by reducing emissions in the covered sectors and/or by using Kyoto offset units up to their allowable limit.</p>	<p>EU member states can use any CER or ERU that is eligible under the EU ETS. In addition, tCERs and ICERs from afforestation and reforestation projects can be used by member states provided they are replaced with eligible Kyoto units prior to expiry.</p> <p>Where member states opt to purchase units for compliance, they are encouraged to purchase CERs from projects in LDCs and small island developing states.</p>

Sources: European Commission 2014; European Environment Agency 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Carbon Fund for Europe (CFE)—multilateral fund	<p>The CFE is a trust fund designed to help some EU countries and private firms meet their commitments under the Kyoto Protocol and the EU ETS. The CFE was launched in March 2007 once the target funding of €50 million was reached from participants.</p> <p>The CFE is funded by governments and the private sector. Contributor governments include Portugal, Ireland, Luxembourg and the Flemish Region of Belgium.</p> <p>The CFE purchases emissions reduction units from the CDM and JI from either the World Bank's existing portfolio of projects, or standalone CDM or JI projects. Units were sourced from projects in the primary market.</p> <p>The CFE has signed eight Emissions Reduction Purchase Agreements to a total amount of 3.2 Mt CO₂-e.</p> <p>The fund is closed to new entrants.</p>	<p>The CFE was established and administered by the World Bank, in cooperation with the European Investment Bank (EIB).</p> <p>Participants devolve all administrative and operational control to the World Bank, which undertakes all project assessment, purchasing, contractual and other arrangements. The credits generated by CFE-funded projects are then apportioned to fund participants.</p>	<p>EU ETS-compatible emissions reduction units were purchased from CDM and JI projects.</p> <p>The fund focuses on projects that cover:</p> <ul style="list-style-type: none"> • renewable energy • energy efficiency • methane recovery • recovery of natural gas.

Sources: Kollmuss, A et al. 2010; UNCCD 2014; World Bank 2010, 2010b, 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Prototype Carbon Fund (PCF)— multilateral fund	<p>The PCF was the pioneering carbon fund established and managed by the World Bank and became operational in 2000.</p> <p>Its mission is to pioneer the market for project-based greenhouse gas emissions reductions while promoting sustainable development and offering a learning-by-doing opportunity to its stakeholders.</p> <p>The PCF piloted the production of emission reductions within the framework of JI and the CDM prior to their ratification under the UNFCCC.</p> <p>Participants included Japan, Canada, Netherlands, Norway, Sweden, Finland and a number of private sector entities.</p> <p>The PCF had a total capital of about US\$220 million, and signed emissions reduction purchase agreements for over 28 Mt CO₂-e in emissions reductions from 24 projects.</p>	<p>The PCF operates as a trust fund established and administered by the World Bank.</p> <p>Participants devolve administrative and operational control to the World Bank, who undertakes all project assessment, purchasing, contractual and other arrangements. Any CDM or JI credits generated by PCF-funded projects are apportioned to fund participants.</p>	<p>The PCF invested in a range of projects prior to the CDM and JI frameworks being ratified by the UNFCCC. The fund was operational when these were ratified and many existing PCF projects transitioned to CDM and JI projects.</p> <p>Most of the portfolio's geographic distribution was in the East-Asia and Pacific region (65 per cent), followed by Latin America and the Caribbean, Europe and Central Asia, and Africa.</p> <p>The PCF portfolio was heavily concentrated in projects promoting mitigation of industrial GHG emissions, renewable energy technology, afforestation/reforestation and energy efficiency.</p>

Sources: Kollmuss, A et al. 2010; UNCCD 2014; World Bank 2010, 2010b, 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
BioCarbon Fund (BioCF)— multilateral fund	<p>The BioCF was established in 2004 as a way to channel investment into projects that reduce greenhouse gas emissions from the land sector, from deforestation and forest degradation in developing countries, and from sustainable agriculture, as well as smarter land-use planning, policies and practices.</p> <p>The BioCF is a multilateral fund, supported by governments and private firms, and is managed by the World Bank.</p> <p>It was the first global carbon fund to focus on land use and has pioneered new methodologies for afforestation/reforestation in the CDM as well as voluntary standards.</p> <p>The BioCF is a public-private sector initiative.</p> <p>There have been three tranches of projects since inception. The BioCF Tranche 1 and Tranche 2 (T1/T2) focus mainly on afforestation and reforestation activities in the primary market projects.</p> <p>T1 started operations in 2004 and had funding of about US\$54 million; T2 began in 2007 with funding of about US\$30 million. These tranches financed 20 land-use change, REDD+ and agriculture projects. The participants in T1 and T2 included Canada, Italy, Luxembourg, Spain and Ireland, and private sector entities. It is closed to new fund participation.</p> <p>Tranche 3 (T3) is known as the Initiative for Sustainable Forest Landscapes. Beginning in 2013, it has total funding of US\$311 million. Current participants include Norway, the US and the UK, and it is open to new participants.</p>	<p>The BioCF operates as a trust fund established and administered by the World Bank.</p> <p>Participants devolve administrative and operational control to the World Bank, who undertakes all project assessment, purchasing, contractual and other arrangements. Any credits generated by BioCF-funded projects are then apportioned to fund participants.</p>	<p>While the LULUCF sector is not currently eligible to generate emission reductions under the CDM, some Afforestation and Reforestation projects are.</p> <p>Most of the BioCF resources under T1 and T2 (about 80 per cent) have been earmarked to Afforestation and Reforestation projects under the CDM. There are also agricultural and REDD+ projects in the T1/T2 portfolios.</p> <p>T3 projects are selected according to a jurisdictional landscape approach (where the trade-offs and synergies between different competing land uses in a jurisdiction are identified and integrated solutions can be offered. Currently, there is expected to be a portfolio of about four jurisdictional programs with country and regional diversity.</p>

Sources: BioCarbon Fund 2014; Kollmuss, A et al. 2010; UNCCD 2014; World Bank 2010, 2010b, 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Spanish Carbon Fund—sovereign fund	<p>The Spanish Carbon Fund was created in 2004 in an agreement between the Spanish Government and the World Bank.</p> <p>This fund was established to purchase greenhouse gas emission reductions from projects developed under the Kyoto Protocol to mitigate climate change while promoting the use of cleaner technologies and sustainable development through the CDM and JI.</p> <p>The fund, which started operations using financial resources provided by the Spanish Government, is also open to participation by Spanish private entities.</p> <p>The fund has invested in projects in two tranches since inception. Tranche 1 (T1) commenced in 2005 and tranche 2 (T2) in 2008. The fund has a total capital of about US\$280 million to purchase a minimum of 34 Mt CO₂-e.</p>	<p>The Spanish Carbon Fund was formed by the Spanish Government, together with representatives of the Spanish industry linked to the energy sector, and the World Bank.</p> <p>The World Bank operates and administers the fund in trust for the Spanish public and private sector participants.</p> <p>Participants devolve administrative and operational control to the World Bank, who undertakes all project assessment, purchasing, contractual and other arrangements. Any Kyoto credits generated by the fund projects were then apportioned to participants.</p>	<p>The Spanish Carbon Fund purchased a range of units in its two tranches, including CERs, ERUs, AAUs and EUAs.</p> <p>The fund had purchased units from projects including industrial energy efficiency, fugitive emissions, energy distribution, transport, hydropower, HFC23 destruction, landfill gas, wind and methane avoidance.</p> <p>It includes projects from many regions, including Latin America, North Africa, East Asia, South Asia, Eastern Europe and the Russian Federation.</p>

Sources: Kollmuss, A et al. 2010; UNCCD 2014; World Bank 2010, 2010b, 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Asia Pacific Carbon Fund (APCF)—multilateral fund	<p>The APCF was established and managed by the Asian Development Bank (ADB) in 2007. The APCF invested in CDM mitigation projects in the ADB's developing country members. It also assisted participants to comply with their emissions reduction commitments.</p> <p>It achieved this by providing up-front finance for eligible CDM projects in exchange for a portion (between 25 and 50 per cent) of the expected future CERs.</p> <p>The fund received a total of US\$152 million from seven governments—Belgium (on behalf of the Flemish Region), Finland, Luxembourg, Portugal, Spain, Sweden and Switzerland.</p> <p>The fund provided project developers with marketing, project development, validation and registration, project implementation and monitoring, and broader capacity development.</p> <p>The fund purchased CERs up to 2012. It will not continue into the second Kyoto commitment period.</p>	<p>Participants devolved all administrative and operational control to the ADB, who undertook all project assessment, purchasing, contractual and other arrangements. The credits generated by APCF-funded projects were then apportioned to participant countries.</p> <p>The APCF maintained a roster of technical experts in a Technical Support Facility to assist developers produce high-quality projects and reduce the risk of non-delivery.</p>	<p>The fund invested only in CDM projects. Projects prioritised by the fund included energy efficiency, renewable energy, and methane capture and utilisation projects. CERs from these projects were required to generate permanent not temporary reductions.</p>

Sources: ADB 2014; UNCCD 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Austrian JI/CDM Programme— sovereign fund	<p>The Austrian JI/CDM Programme was established in 2003 to purchase Kyoto units to meet its emission targets under the first Kyoto commitment period. Currently, there are no plans to extend the fund to purchase units for the second commitment period.</p> <p>The programme had a maximum funding of US\$579 million.</p> <p>The overall target of the programme was to purchase a maximum 80 Mt CO₂-e of emissions reductions.</p> <p>Currently, the portfolio consists of 76 projects in more than 29 countries.</p>	<p>The programme was established under legislation with the Minister for the Environment the responsible authority. The minister was supported by an advisory board made up of representatives from relevant ministries and key Austrian stakeholder groups.</p> <p>Management of the programme was devolved entirely to a private company, Kommunalkredit Public Consulting GmbH. The company has specific competencies, experience in environmental protection and financial expertise. The management team comprises technical, commercial and legal experts who:</p> <ul style="list-style-type: none"> • carry out all purchases of units • control and actively manage the performance risk of the portfolio. 	<p>The programme purchased units from the CDM and JI, as well as from Green Investment Schemes (GIS-based AAUs).</p> <p>The priority areas included:</p> <ul style="list-style-type: none"> • renewable energy • energy efficiency • recovery of landfill gases. <p>The programme did not purchase from any industrial gas (HFC-23) or large hydro-electric projects not covered by the World Commission on Dams report.</p> <p>All host countries for the CDM and JI are eligible.</p> <p>The programme has also established an independent initiative called CDM in Africa, in order to develop projects in sub-Saharan Africa.</p>

Sources: Kommunal Kredit 2014; UNCCD 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
French Global Environment Facility (FGEF)— sovereign fund	<p>The FGEF was created by the French Government in 1994. Its remit is broad, ranging from developmental objectives to financing mitigation action via the CDM, JI and REDD+ projects.</p> <p>The facility invested approximately €65 million between 2003 and 2009 in 51 projects across 20 countries.</p> <p>The facility directly finances new projects in primary markets. It also co-finances with other parties including multilateral banks and private institutions.</p> <p>The FGEF is involved in French foreign aid, as a part of French Official Development Assistance.</p>	<p>The FGEF operates through three interacting bodies.</p> <p>An inter-ministerial Steering Committee, which is made up of five government departments and is chaired by the French Treasury, makes decisions on</p> <ul style="list-style-type: none"> • general policy • timeliness of projects • financial commitments. <p>The Scientific and Technical Committee, a consultative body comprising about 10 experts:</p> <ul style="list-style-type: none"> • makes recommendations and observations on projects • conducts and leads work dealing with the scientific, technical and socioeconomic issues • participates in capacity-building for stakeholders. <p>The Secretariat comprises about 10 permanent staff members and performs the following functions:</p> <ul style="list-style-type: none"> • project appraisals and follow-ups • preparation and implementation of decisions made by the Steering Committee • sectoral relations with institutional, scientific, economic and associate partners, bilateral and multilateral donors and other stakeholders. 	<p>The FGEF supports mitigation through:</p> <ul style="list-style-type: none"> • financing projects via UNFCCC schemes including the CDM, JI and REDD+ • providing lines of credit or guarantees • providing specialised investment funds for energy efficiency and renewables. <p>The FGEF encourages projects for climate change mitigation projects that reduce or curb the use of fossil fuels and greenhouse gas emissions by promoting:</p> <ul style="list-style-type: none"> • uses of renewable and low-emissions energy • biomass-to-energy systems • energy-efficient production systems • improved energy efficiency in housing, transport, industry and agriculture • carbon storage in forests, soils and subsoils. <p>The FGEF co-finances projects across Latin America, Africa and Asia.</p>

Sources: FGEF 2014, 2014b; UNCCD 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Norway— sovereign fund	<p>The Norwegian Government has been active in the market since 2000, prior to the CDM and JI rules being ratified. In the first phase Norway participated through multilateral funds, and as from 2007 as a direct market participant.</p> <p>As from 2007 the purpose of the Norwegian Procurement Program was to exceed Norway's commitment in the first Kyoto Period (2008-2012) by 10 per cent</p> <p>Norway's purchase program is not linked to the EU ETS but Norway is a participant in the EU ETS. In the second phase of EU ETS (2008-2012) Norway exchanges a certain number of AAU for EUAs, and EUAs surrendered by the installations regulated by the EU ETS are used in the Norway's Kyoto accounts. In the third phase of EU ETS this arrangement is yet to be negotiated between the EU and Norway.</p> <p>The Norwegians have engaged carbon markets in a variety of ways including:</p> <ul style="list-style-type: none"> • direct purchasing through brokers and tenders • contributing to multilateral carbon funds such as the Prototype Carbon Fund and Nordic Environment Finance Corporation (NEFCO) • purchasing via the NEFCO Norwegian Carbon Procurement Facility. <p>Norway is likely to require 120 Mt CO₂-e of emissions reductions for the second commitment period, and is looking to purchase this via tender and NEFCO funds. This includes the 'NEFCO Norwegian Carbon Procurement Facility', which is seeking about 30 Mt CO₂-e of emissions reduction units.</p> <p>The Norwegians have been pioneers in the carbon market and participated in innovative multilateral funds such as the Prototype Carbon Fund, which invested in projects before the CDM was established. This pioneering approach continues via its participation in the BioCarbon Fund, which invests in schemes such as REDD+ under the new market mechanisms.</p>	<p>The Norwegian purchase program has involved many governance arrangements and administrative structures over the years.</p> <p>These have included self-managed funds, partially outsourced projects and fully outsourced initiatives, including the projects managed by the World Bank.</p> <p>Currently, the Norwegian program is run internally by a small number of staff. Most of the core procurement and legal services are outsourced.</p>	<p>Historically, Norway has accepted all types of units for purchase in order to meet its Kyoto targets including CERs, EUAs and AAUs.</p> <p>However, for the second commitment period, Norway unilaterally decided to implement the same quantitative limitations on its purchase program as applied in the ETSs, including:</p> <ul style="list-style-type: none"> • HFC projects • N₂O credits from adipic acid production • some large hydro-electric projects over 20MW. <p>Norway excludes coal projects that do not involve Carbon Capture and Storage technologies.</p> <p>For the second commitment period, Norway will restrict unit purchases to those projects that are:</p> <ul style="list-style-type: none"> • at risk of discontinuing their operations due to lack of financial support • newly developed. <p>Norway may consider further investment in new market mechanisms via multilateral funds including the Carbon Partnership Facility.</p>

Sources: BioCarbon Fund 2014; NEFCO 2014; World Bank 2010, 2010b, 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Belgium— sovereign fund	<p>Under Belgium's 2007 burden sharing agreement to meet its Kyoto target, the three regions of Belgium: Wallonia, Flanders and the capital Brussels have separate emissions-cutting goals. Each region had its own credits purchase policy for the first Kyoto Protocol commitment. The Federal state also contributed to the reduction by undertaking domestic reductions and purchasing additional international units from the market.</p> <p>The Flanders region has participated in World Bank funds such as the Carbon Fund for Europe to obtain units. They have also run tenders.</p> <p>The Walloon and the Brussels-Capital regions have contributed to the World Bank's Carbon Fund for Community Development to procure CDM units.</p> <p>The Walloon region will soon establish a fund that will address a range of climate objectives, including the purchase of international units.</p> <p>At the Federal level, a 'Kyoto Fund' was established in 2002, which is primarily financed by consumer contributions on electricity bills in the order of €25 million per annum. This fund was set up to finance the federal climate policy and was therefore also used to finance the federal carbon credit purchase program. The fund had a purchase target of 12.2 million units, however almost 15 million units were purchased due to low prices.</p> <p>Federal purchases have been made via 2 tenders targeting the primary market, 1 tender targeting the secondary market, a bilateral carbon fund with the German development bank KfW, an investment in the Hungarian Green Investment Scheme, and a partnership agreement with the Chinese province of Hunan.</p>	<p>The Belgian programme has been varied as both the Federal and individual regions have participated in the market for international units.</p> <p>The Belgium burden sharing agreement in 2007 established a National Climate Commission which was the focal point for JI projects and also the Designated National Authority for CDM projects.</p> <p>The regions have mostly devolved purchasing to multilateral funds. The exception to this is Flanders who has engaged the market directly through tender programs.</p>	<p>Belgium uses, ERUs and CERs units for compliance with both the EU ETS and the EU Effort Share Decision. AAUs are also used in Belgium for compliance under the Kyoto Protocol</p> <p>Units purchased for compliance must now comply with EU ETS restrictions: no HFC-23 projects, N₂O credits from adipic acid production, and some large hydroelectric projects over 20MW.</p> <p>Similarly, as the Belgium is party to the EU Effort Share Decision, units purchased for compliance must comply with EU Effort Share restrictions. However, while the Effort Share does not exclude HFC-23, Belgium has voluntarily restricted the purchase of these units.</p> <p>Individual regions have also imposed additional restrictions. For instance, in a recent tender, the Flanders region also excluded coal projects that do not involve Carbon Capture and Storage technologies.</p> <p>The Federal government has also applied strict criteria based on the Gold Standard to evaluate the projects' contribution to the sustainable development of the host country. The inclusion of this criteria meant that these units attracted a premium over others units.</p>

Sources: Belgian JI/CDM Tender 2014; Kollmuss, A et al. 2010; Van Hecke, K et al. 2010

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
The Swedish CDM and JI Programme—sovereign fund	<p>The Swedish CDM and JI Programme has been operational since 2002 and has a total budget of about €300 million.</p> <p>The objectives of the programme are to further develop the flexible mechanisms to help lay the foundation for continued and expanded international climate cooperation, achieve cost-effective greenhouse gas reductions and contribute to sustainable development in the host countries of the projects.</p> <p>The programme is administered by the Swedish Energy Agency and operates through Sweden's International Climate Investment Programme (SICLIP).</p> <p>To date, SICLIP has participated in over 80 CDM and 2 JI projects in 47 countries in Asia, Africa, Latin America and Eastern Europe, as well as through a number of multilateral funds. More than a fifth of the contracted volume comes from projects in LDCs.</p> <p>Sweden has also contributed to several multilateral CDM and JI funds, including the Prototype Carbon Fund, Nordic Environment Finance Corporations Carbon Fund and Asia Pacific Carbon Fund, and has invested about US\$95 million in these funds.</p> <p>SICLIP will fund up to 40 Mt of CO₂-e emissions reductions through the CDM and JI as part of Sweden's national target for 2020. To date, more than half of that volume has already been committed.</p>	<p>The Swedish Energy Agency has been responsible for the Swedish CDM and JI Programme.</p> <p>The agency administers projects and undertakes policy work internally for most things (to undertake procurement, project management normally associated with bilateral tenders) but also engages consultants for specific tasks in relation to due diligence or legal services</p> <p>Other parts of the Swedish Programme were devolved entirely to third parties, including participation in the multilateral funds.</p>	<p>CER and JI units purchases are intended for Sweden's national target and do not need to comply with the EU ETS restrictions.</p> <p>Sweden chooses, however, to adopt similar restrictions in the bilateral part of the portfolio including no HFC-23, nuclear, or large-scale hydro.</p> <p>The Swedish purchase programme has also not engaged in purchases of palm-oil related CDM projects.</p> <p>The programme has focused on renewable energy, improved energy efficiency and more recently methane utilization (waste management).</p> <p>The purchases have focused on small and medium-sized projects.</p> <p>To encourage broader geographical distribution of CDM and JI activities, the units are purchased from a range of regions.</p> <p>Temporary CERs (tCERs) are allowed if renewed or replaced by an eligible unit prior to expiry. To date, the programme has bought tCERs from one afforestation sequestration project in the form of a string of tCERs.</p>

Sources: NEFCO 2014; SEA 2012, 2014; World Bank 2010, 2010b, 2014

COUNTRY/ FUND	DESCRIPTION	GOVERNANCE AND ADMINISTRATION	UNITS PURCHASED, RESTRICTIONS AND PREFERENCES
Netherlands—sovereign fund	<p>The Netherlands Government has operated a purchase program since 2001–02. Its initial target of 100 Mt was gradually reduced to only 30 Mt for compliance in the first commitment period of the Kyoto Protocol.</p> <p>The Netherlands is not looking to purchase units in the second commitment period.</p> <p>The Netherlands has engaged in carbon markets in a variety of ways, including:</p> <ul style="list-style-type: none"> • direct purchasing through tenders • contributing to multilateral carbon funds (via the World Bank and other organisations) such as the Prototype Carbon Fund, the Netherlands CDM Facility and the Netherlands European Carbon Facility • private institutions (via Rabobank) • a bilateral agreement with Indonesia. 	<p>The Netherlands program has involved many governance arrangements and administrative structures over the years.</p> <p>These have included self-managed funds, partially outsourced projects and fully outsourced initiatives, including the projects managed by the World Bank.</p>	<p>The funds purchased units from most types of UNFCCC-eligible project types, and from the CDM and JI, including HFC23 credits.</p> <p>The program has also purchased some HFC23 units; however, these have not been retired against Kyoto commitments and are still sitting on the national registry.</p> <p>The Netherlands has a pioneering history in the carbon market. For instance, through the Prototype Carbon Fund it contributed to projects before the CDM and JI rules were ratified. The Netherlands is also supporting capacity-building in developing countries in their efforts to reduce emissions. This is being achieved via REDD+ projects and the Forest Carbon Partnership.</p>

Sources: UNCCD 2014; World Bank 2010, 2010b, 2014

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GLOSSARY

2 degree goal	A globally agreed goal to limit global average warming to less than 2 degrees above pre-industrial levels.
accounting	The rules that specify how to estimate greenhouse gas emissions and what emissions count towards an emissions reduction target.
Annex I countries/Parties	Industrialised countries and economies in transition listed in Annex I to the United Nations Framework Convention on Climate Change.
Assigned Amount Units	A tradable 'Kyoto Protocol unit' representing an allowance to emit one metric tonne of CO ₂ -e. They are issued up to the level of initial 'assigned amount' of an Annex I Party to the Kyoto Protocol.
business-as-usual (emissions trend)	Emissions that would occur without any policy intervention (or any additional policy intervention).
carbon dioxide equivalent	A measure that quantifies different greenhouse gases in terms of the amount of carbon dioxide that would deliver the same global warming. It can be expressed as CO ₂ -e.
Certified Emission Reduction units	A tradeable 'Kyoto Protocol unit' generated by Clean Development Mechanism projects under the rules of the Kyoto Protocol. They represent a reduction of one metric tonne of CO ₂ -e.
Clean Development Mechanism	One of the three flexibility mechanisms defined in the Kyoto Protocol. It facilitates the creation of tradeable Certified Emission Reductions from projects in developing countries.
commitment period	The time frame of binding national goals under the Kyoto Protocol. The first commitment period was five years from 2008–12. The second commitment period is eight years from 2013–20.
emissions reduction	The act or process of limiting or restricting greenhouse gas emissions.
Emissions Reduction Fund	A \$2.55 billion fund proposed by the Australian Government to allocate money through a reverse auction to emissions reduction projects.
emissions reduction target	A goal for national emissions in a specific year.
Emission Reduction Units	A tradeable 'Kyoto Protocol unit' generated by Joint implementation projects under the rules of the Kyoto Protocol. A unit represents a reduction of one metric tonne of CO ₂ -e.
emissions trading scheme	A market-based approach to reducing emissions that places a limit on emissions allowed from all sources covered by the scheme. Emissions trading allows entities to trade emissions units with other entities. In general, trading can occur at the domestic, international and intra-company level.
greenhouse gas	Any gas (natural or produced by human activities) that absorbs infrared radiation in the atmosphere. Key greenhouse gases include carbon dioxide, water vapour, nitrous oxide, methane and ozone.
Intergovernmental Panel on Climate Change	An international scientific body operating under the auspices of the United Nations. Its role is to review, assess and synthesise the latest information on climate change.
Joint Implementation	One of the three flexibility mechanisms defined in the Kyoto Protocol. It facilitates the creation of tradeable emissions reductions units from projects undertaken in countries that have a Kyoto Protocol target.
Kyoto Protocol	An international agreement adopted under the United Nations Framework Convention on Climate Change in 1997. It includes binding national targets for developed countries and flexible mechanisms including the Clean Development Mechanism.
Kyoto Protocol unit	Emissions units eligible for compliance with Kyoto Protocol targets—these include Assigned Amount Units, Certified Emission Reduction units, Emission Reduction Units and Removal Units.
land use, land use change and forestry (LULUCF) emissions	Emissions associated with human-induced changes in land use, such as deforestation, afforestation and forest management.
New Market Mechanisms	An umbrella approach for a range of emissions reduction schemes to exist alongside established schemes such as the Clean Development Mechanism.
Removal Units	A tradable 'Kyoto Protocol unit' representing one metric tonne of greenhouse gases that is removed by carbon sink activity in an Annex I (developed) country.
true-up period	A period lasting 100 days allowing countries to review their emissions inventories to ensure that they retire the right amount of units for compliance under the Kyoto Protocol. Countries can continue to trade in this period.
United Nations Framework Convention on Climate Change	An international treaty that commits signatory countries (Parties) to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human-induced interference with the climate system.

ABBREVIATIONS AND ACRONYMS

AAU	Assigned Amount Unit, created under the Kyoto Protocol
BioCF	BioCarbon Fund
CO₂	carbon dioxide, a greenhouse gas
CO₂-e	carbon dioxide equivalent
CCS	carbon capture and storage
CDM	Clean Development Mechanism of the Kyoto Protocol
CER	Certified Emission Reduction unit, created under the Clean Development Mechanism
ERF	Emissions Reduction Fund
ERU	Emission Reduction Unit, created under Joint Implementation
ETS	Emissions Trading Scheme
EU	European Union
EUA	European Union Allowance, an emissions unit issued under the EU ETS
EU ETS	European Union Emissions Trading System
GHG	greenhouse gas
HFC	hydrofluorocarbons, a greenhouse gas
HFC-23	trifluoromethane, a greenhouse gas
HCFC	hydrochlorofluorocarbon, an ozone-depleting substance
JI	Joint Implementation of the Kyoto Protocol
ICER	long-term Certified Emission Reduction unit, created under the Clean Development Mechanism
LDC	Least-Developed Country(s)
LULUCF	land use, land use change and forestry
Mt	megatonne (mass, one million metric tonnes)
NO	nitrous oxide, a greenhouse gas
NMM	New Market Mechanism under the United Nations Framework Convention on Climate Change
NAMA	Nationally Appropriate Mitigation Actions under the United Nations Framework Convention on Climate Change
REDD+	Reducing Emissions from Deforestation and Forest Degradation in developing countries (includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks) under the United Nations Framework Convention on Climate Change
t	tonne (mass, one metric tonne)
tCER	temporary Certified Emission Reduction unit, created under the Clean Development Mechanism
UNFCCC	United Nations Framework Convention on Climate Change

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