The Kyoto Protocol accounting rules

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<tr>
<td>AAU</td>
<td>Assigned amount unit</td>
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<tr>
<td>CAD</td>
<td>Compilation and accounting database</td>
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<td>CDM</td>
<td>Clean development mechanism</td>
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<td>CER</td>
<td>Certified emission reduction</td>
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<td>COP</td>
<td>Conference of the Parties</td>
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<td>CPR</td>
<td>Commitment period reserve</td>
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<td>DCC</td>
<td>Department of Climate Change</td>
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<td>ERU</td>
<td>Emission reduction unit</td>
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<td>ITL</td>
<td>International Transaction Log</td>
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<td>JI</td>
<td>Joint implementation</td>
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<td>JISC</td>
<td>Joint Implementation Supervisory Committee</td>
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<td>ICER</td>
<td>Long-term certified emission reduction</td>
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<td>LULUCF</td>
<td>Land use, land use change and forestry</td>
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<td>RMU</td>
<td>Removal unit</td>
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<td>tCER</td>
<td>Temporary certified emission reduction</td>
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<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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Introduction

In one of his first acts as Prime Minister of Australia, the Hon. Kevin Rudd MP ratified the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) in December 2007. Under this international agreement, Australia is committed to maintaining its national greenhouse gas emissions at (or below) 108 per cent of its 1990 emission levels for each year from 2008 to 2012.

Australia’s 108 per cent Kyoto Protocol target is strictly defined by the accounting rules established by the UNFCCC Secretariat. Such rules set out the methods for calculating and reporting country allowances. Within the accounting rules there are mechanisms available which, to a limited extent, facilitate the task of meeting the 2012 target. The rules also provide some flexibility so that countries with particular economic, environmental or industrial situations may, through certain avenues, tailor their commitments according to their circumstances.

This paper summarises the key accounting provisions of the Kyoto Protocol and presents Australia’s decisions with respect to the electives, and its ensuing obligations under the Kyoto Protocol treaty.

The Kyoto Protocol

The requirements and accounting procedures for emissions and allowances under the Kyoto Protocol are detailed in the Kyoto Protocol Reference Manual published by the UNFCCC Secretariat.

Specific methodologies or scientific procedures, which are outside the scope of this paper but complementary to the accounting rules, are outlined in:

- The Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories
- The Good Practice Guidance for Land Use, Land-Use Change and Forestry
- The IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories

The Kyoto Protocol makes regular reference to two types of participants: Annex I and non-Annex I parties.

1. K. Rudd (Prime Minister), Ratifying the Kyoto Protocol, media release, Canberra, 3 December 2007.
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- Annex I parties are developed countries that have individual emission-reduction targets defined by the specific accounting rules. Australia is one of 41 Annex I parties.  

- Non-Annex I parties are developing countries that have no emission-reduction targets but are still able to take part in certain Kyoto Protocol activities (as detailed later).

Definitions

Assigned amount

Broadly, the ‘assigned amount’ is the total amount of greenhouse gas emissions that a country is permitted under the Kyoto Protocol agreement period. Under Article 3.1 of the Kyoto Protocol, Australia is to meet a target of 108 per cent of its 1990 emission levels annually by the end of the five-year first commitment period (2008-2012). More precisely, Australia is to ensure that its ‘…aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed [108 per cent of 1990 levels]…’.

Carbon dioxide (CO₂) is not the only greenhouse gas. Many other gases are more effective at retaining heat than CO₂, but exist at smaller concentrations in the atmosphere. Converting to ‘carbon dioxide equivalent’ (CO₂-e) emissions is a way to amalgamate the global warming effect of all the different greenhouse gases into one meaningful number. CO₂-e is the emissions of carbon dioxide that would cause the same heating of the atmosphere as a particular mass of Annex A greenhouse gases. The Annex A greenhouse gases are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

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3. The other Annex I parties are Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, European Community, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.


The sectors that count towards the Kyoto Protocol’s accounting of Annex A greenhouse gas emissions are: the energy industries, manufacturing and construction, transport, industrial processes, solvents and other product use, agriculture and waste. Importantly, emissions associated with land use, land use change and forestry (LULUCF) are not included under Annex A greenhouse gas accounting.

In its first report under the Kyoto Protocol, Australia reported 1990 levels at 553,773.80 Gigagrams (1 Gg = 1,000 tonnes). Therefore, by 2012 total Australian CO$_2$-e emissions over the five years need to be below 2,990,378.53 Gg (five times 108 per cent of the 1990 estimate). This quantity is Australia’s assigned amount. Its individual units are called Kyoto Protocol units or assigned amount units (AAU). Each AAU represents an ‘allowance to emit one metric tonne of carbon dioxide equivalent’.

Australia’s Assigned Amount = 2,990,378.53 Gg

Commitment Period Reserve

The Kyoto Protocol accounting rules also define a ‘commitment period reserve’ (CPR). The CPR is an Annex I Party’s lowest permissible target. Units in excess of the CPR are tradeable, so it exists to avoid parties over-selling units and potentially compromising their capacity to meet individual targets.

The CPR is calculated at the beginning of the first commitment period and is equal to either 90 per cent of the assigned amount or five times the Annex A emissions in the most recent reporting year of the commitment period, whichever is lower. For Australia (and most developed countries), the former is applied.

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8. A complete list of the Annex A sectors is provided in the Kyoto Protocol to the United Nations Framework Convention on Climate Change

9. LULUCF relates to ‘the exchange of carbon between the atmosphere and the terrestrial pool of aboveground biomass, below-ground biomass, and soils… through photosynthesis and plant and soil respiration…Humans are changing the natural rate of exchange of carbon between the atmosphere and the terrestrial biosphere through land use, land-use change, and forestry activities. Consequently, it is important to examine how carbon flows between different pools and how carbon stocks change in response to afforestation, reforestation, and deforestation (ARD) and other land-use activities,’ Intergovernmental Panel on Climate Change, Land Use, Land-Use Change And Forestry, IPCC Special Report, 2000. This is in contrast to emissions from the agricultural sector which are from enteric fermentation, manure management, rice cultivation


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\[
\text{CPR} = 90 \% \text{ of Assigned Amount} = 0.9 \times 2,990,378.53 \text{ Gg} \\
\text{Australia’s CPR} = 2,6921,340.68 \text{ Gg}
\]

Accounting

There are two non-exclusive ways by which an Annex I Party can meet its target under the Kyoto Protocol. A country may either:

- reduce its emissions to be within its assigned amount, or
- increase the size of the assigned amount to ensure that its emissions do not exceed it. A country can do this through both Kyoto mechanisms and LULUCF activities.

Emission reduction

In reducing Annex A greenhouse gas emissions, as part of its Kyoto commitments, each Annex I Party must also establish and maintain a ‘national system’ to keep track of its greenhouse gas data. Based on this national system, annual national greenhouse gas inventories are submitted for review to a central body and ultimately entered into a global ‘compilation and accounting database’ (CAD).

Australia’s National System is described in *The Australian Government’s Initial Report under the Kyoto Protocol* and consists of a single agency: the Department of Climate Change (DCC).

The DCC is responsible for all aspects of co-ordination activities; emissions estimation; the preparation of the reports and for their submission to the UNFCCC on behalf of the Australian Government… The DCC maintains a unit of five staff to manage the National Inventory Systems required to deliver Australia’s National Greenhouse Accounts.\(^{12}\)

The annual national greenhouse gas accounts must report on the six greenhouse gases previously mentioned (CO\(_2\), CH\(_4\), N\(_2\)O, HFCs, PFCs, and SF\(_6\)) by sector. The six sectors for reporting are:

- energy
- industrial processes
- solvents and other product use
- agriculture

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- waste, and
- LULUCF (LULUCF sector gases must still be reported on, even though they are not included in Annex A)

It is conceivable and perfectly acceptable for any Annex I Party to meet its 2012 goals purely by reducing its domestic emissions, provided that these are reported on as described above, and in line with the reporting requirements.

However, the Kyoto Protocol also allows for another way by which to meet commitment targets. This is by means of LULUCF activities and other methods known as ‘Kyoto mechanisms’—often referred to informally as ‘flexible mechanisms’.

LULUCF and Kyoto mechanisms

As previously explained, an Annex I Party may be permitted to increase its assigned amount. The Kyoto Protocol provides avenues to ‘move the target’, or increase the emission allowance, which thereby makes it easier for a country to achieve its overall reductions.

Australia’s assigned amount consists of individual units called AAUs (assigned amount units) that each represent an ‘allowance to emit one metric tonne of carbon dioxide equivalent’. The commitment period reserve is the minimum number of AAUs an Annex I Party must keep in its account. It is therefore the lowest the country’s threshold, or target, can reach. However, above the CPR, each Annex I country is able to increase or decrease its units through various types of activities, namely LULUCF activities or Kyoto mechanisms. Figure 1 depicts Australia’s assigned amount and CPR and the flexibility beyond them.

![Figure 1: Australia’s total emissions allowances](image)

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The means by which an Annex I country’s emissions allowance can be altered are:

- **Kyoto mechanisms:**
  - emissions trading
  - joint implementation (JI), and
  - clean development mechanism (CDM)

- **LULUCF activities:**
  - afforestation
  - reforestation, and
  - deforestation.

**Kyoto mechanisms**

**Kyoto Protocol emissions trading**

Annex I parties may trade Kyoto Protocol units between them as long as each retains a minimum number in its account. This minimum is equal to the party’s CPR:

Kyoto Protocol units acquired from another Party under the Kyoto mechanisms are added to a Party’s assigned amount, whereas units transferred to another Party are subtracted from a Party’s assigned amount.¹⁴

The concept of emissions trading lies in the idea that as long as emission reduction occurs in a global sense, it is not important where the actual reductions take place. Because the cost and ease of emissions reduction varies by country, emission trading allows the cheapest solution to a global problem. Annex I parties who achieve large emissions cuts easily and cheaply are able to sell left-over emissions savings as credits to other Annex I parties who cannot meet their target as cheaply.

**Joint implementation**

Annex I countries may generate emissions credits—here called emission reduction units (ERU)—by investing in a joint implementation (JI) project. This is an approved project that reduces emissions in another Annex I Party. The ERUs can be issued either directly from the

JI host country to the investing country, or more formally through the Joint Implementation Supervisory Committee (JISC).

An example of a JI project is the Te Apiti Wind Farm in New Zealand. This consists of 55 turbines, each producing 1.65 MW of electricity, powering 45,000 homes. The project, managed by Meridian Energy, is the result of collaboration between the New Zealand and Netherlands governments. A total of 30 JI projects are currently registered with the UNFCCC. Australia is not involved in any JI projects as yet.

Clean development mechanism

Annex I countries may generate emissions credits—here called certified emission reductions (CER)—by investing in a CDM project. This is an approved project that reduces emissions in a non-Annex I country. In order to obtain the CER, the Annex I country must be able to demonstrate the CDM reduces emissions more so than in absence of the project; this is the ‘additionality test’.

CDMs may result in three types of units: CERs, temporary CERs (tCERs) and long-term CERs (lCERs). CERs are issued by the CDM Executive Board.

All Kyoto Protocol units—including CER and ERU—are tracked and managed in the Annex I country’s electronic database called the ‘national registry’ which must conform to strict standards (this is separate to the ‘national system’). A central ‘International Transaction Log’ (ITL) manages the movement of units between countries and each ‘national registry’ must be in agreement with the ITL.

There are currently 1313 CDM projects registered by the CDM Executive Board; however Australia is not involved in any registered CDM projects to date. An example of a CDM project is the Japanese Nagamas Biomass Cogeneration Project in Indonesia. This project consists of the construction of a biomass cogeneration plant at a bulk storage terminal in

18. ‘Additionality’ is whether the project reduces emissions more than in the absence of the project, with reference to a time-relative baseline.
Dumai, Sumatra. Approximately 75 471 tonnes of CO₂-e emissions per year are expected to be reduced ‘through the displacement of fossil fuels for heat and power generation’.  

**LULUCF activities**

LULUCF activities are described as afforestation (the planting of a new forest), reforestation (the replanting of a forest that has been lost for any reason) and deforestation (the clearing of a forest). Emissions or removals resulting from LULUCF activities are treated differently to Annex A sectors. They contribute to changes to the assigned amount, outside the CPR. Within the Kyoto Protocol, three important articles—articles 3.3, 3.4 and 3.7—deal with LULUCF issues.

**Article 3.3**

Emissions or removals resulting from land which was converted, after 31 December 1989, to or from a forest through afforestation, reforestation or deforestation are accounted for in Kyoto Protocol units, here called removal units (RMUs).

Each Party must issue RMUs on the basis of net removals from activities under Article 3, paragraphs 3 and 4.  

For the purposes of article 3.3, Australia has defined a forest as an area with:

- tree crown cover of 20% canopy
- minimum land area of 0.2 hectares, and
- minimum tree height of 2 metres.

Each Annex I Party elects whether to report emissions from article 3.3 activities annually or only once at the end of the commitment period. Australia has chosen annual reporting.

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24. ibid.
Article 3.4

Article 3.4 covers land use that is not afforestation, reforestation or deforestation. This includes:

- forest management
- cropland management
- grazing land management, and
- revegetation.

At the beginning of the commitment period, each Annex I Party decides which article 3.4 activities it wishes to include and therefore account for. **Australia has chosen not to include any article 3.4 activities.** This is primarily because if a country elects an activity, it must include all carbon movement from activities on the land. Australia has high risks of drought and bushfires which can release large quantities of carbon dioxide (the burning of wood releases carbon, as does the decay of plants during times of drought). Therefore, Australia has chosen not to include emissions or removals from any article 3.4 activities.25

Article 3.7

Article 3.7 of the Kyoto Protocol has come to be known as ‘the Australia clause’ as it was campaigned for by Australian Senator Robert Hill in the final stages of negotiations.26 It allows Annex I parties to include greenhouse gas emissions from land use change in 1990-base year calculations. This is important for Australia because, in 1990, national forestry and land clearing activities represented net sources of emissions. Reducing these activities from what they were in 1990 therefore counts as an emission reduction, without actually reducing direct emissions.

Article 3.7 is taken into consideration during the initial calculation of the assigned amount, and in the national approach to Article 3.3; it has no other impact for ongoing accounting.

**Reporting**

To complement the two accounting methods, there are also two parallel and interlinked reporting streams. In order to keep track of country targets and the progress of each party towards meeting these, the UNFCCC Secretariat outlines strict reporting practices.

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As previously outlined, each Annex I Party must establish a ‘national registry’ to keep track of, and provide information on, the movements of units from LULUCF activities and Kyoto mechanisms. A document, prepared annually, reports on:

- the movement of Kyoto Protocol units from trading
- the addition of emissions reduction units from JI projects
- the addition of certified emission reductions units from CDM projects, and
- the addition of removal units from LULUCF activities.

This document allows the calculation of the Annex I country’s revised emissions allowance.

In addition, and as detailed previously, each Annex I Party must establish and maintain a ‘national system.’ This system is used to calculate annual national greenhouse gas inventories that report on Annex A emissions. So, in essence, the greenhouse gas inventory provides information on the country’s actual emissions (exclusive of LULUCF emissions, which are counted in the national registry).

The emissions figures provided in the inventory can then be evaluated against the revised emissions allowance from LULUCF activities and Kyoto mechanisms reporting. It is in consideration of these two accounts that the Annex I Party’s compliance can be assessed. The two parallel streams of reporting are illustrated schematically in Figure 2.

For compliance: \( B \leq A \)

Figure 2: Kyoto Protocol accounting, reporting, and compliance requirements
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The reports

Over the official five-year commitment period (2008 to 2012), and a longer unofficial 10-year period (2006 to 2015), a series of specific reports need be submitted in order to meet the above requirements. These are illustrated in Figure 3.

![Figure 3: The Kyoto Protocol accounting timeline](Source: UNFCCC Secretariat, ‘Kyoto Protocol Reference Manual on Accounting of Emissions and Assigned Amounts’, February 2007, p21]

These reporting requirements are:

- **An initial report**, submitted once before the commitment period, includes the country’s yearly greenhouse gas emissions data from 1990, a calculation of its initial assigned amount and CPR, and decisions regarding articles 3.3 and 3.4. It also provides a description of the national system and registry. Australia’s initial report was submitted in 2008.

- **Five mandatory annual reports** are due from 15 April 2010. The first mandatory annual report relates to 2008, the first year of the commitment period. Further to this, for full eligibility to participate in the Kyoto mechanisms, countries submit ‘voluntary’ annual reports from 2007. The annual reports must contain information on the greenhouse gas inventory, LULUCF, changes to the emissions allowance and changes to the national system, and registry.

- **In addition to the above**, Annex I and non-Annex I countries must periodically submit ‘national communications’. These contain information on ‘national circumstances, vulnerability assessment, financial resources and transfer of technology, and education,
training and public awareness; but the reports from Annex I Parties also contain information on policies and measures.27

Most of the 41 Annex I Parties submitted their first report … in 1994 or 1995, their second in 1997–1998 and the third after 30 November 2001. The fourth national communications were due on 1 January 2006; by 15 June 2008, UNFCCC secretariat had received 40 communications.28

• The true-up period report is due once, after the commitment period. The true-up period is a period lasting 100 days after reviews of emissions information from the commitment period have been completed. Unit transfers can still occur during this period, which is expected to start in 2014. The true-up period report contains all the information that is normally reported annually, with ‘final information on holdings of and transactions of Kyoto Protocol units including all units retired for compliance purposes’ and must cover both the calendar year 2014 and the true-up period.29

Australia’s reports to the UNFCCC Secretariat under the Kyoto Protocol are available from the Department of Climate Change website in time, as they are submitted.30

Review and compliance

The Compliance Committee considers ‘questions of implementation’ concerning compliance with Kyoto Protocol requirements. The committee consists of two branches: the facilitative branch which provides advice, and the enforcement branch. The enforcement branch has the ability and duty to assess compliance and potentially to:

• correct Kyoto Protocol unit and greenhouse gas inventory data before official integration in the CAD
• suspend and reinstate eligibility to participate in the Kyoto mechanisms
• determine non-compliance emissions commitment at the end of the commitment period and subsequently:

28.  UNFCCC, ‘National communications Annex 1’,
30.  Department of Climate Change, ‘Publications’,
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– deduct 1.3 times the amount of excess emissions from the assigned amount of the following commitment period
– request the development of a compliance action plan, and
– suspend eligibility to transfer units.

Progress in Australia

Under the Kyoto Protocol to the UNFCCC, Australia intends to reduce its CO₂-e emissions over five years to below 2,990,378.53 Gg. On 30 September 2009, the Government announced the establishment of the Australian National Registry of Emissions Units and Australia’s National Authority for the CDM and JI. These open another avenue for meeting emission reduction targets by allowing Australian companies, and Australia as a Party to the Kyoto Protocol, to participate in flexibility mechanisms.

Australia is also participating in international negotiations looking forward to the second commitment period, post-2012. In December 2008, Australia was present at the United Nations Climate Change Conference of the Parties (COP) 14 in Poznań, Poland. This was the last COP before a new global agreement is to be finalised for 2013-18 at COP15, in Copenhagen in December 2009. Interestingly, discussions in Poznan focussed more heavily on adaptation than the mitigation efforts defined by the Kyoto Protocol. However, some progress was made towards reducing emissions from deforestation and forest degradation, and towards fine-tuning the existing flexible mechanisms.

Conclusion

Having ratified the Kyoto Protocol to the UNFCCC, Australia has committed to the accounting procedures detailed here in maintaining its national greenhouse gas emissions at (or below) 108 per cent of its 1990 emission levels for each year from 2008 to 2012. In line with the reporting requirements of the Kyoto Protocol, Australia has submitted The Australian Government’s Initial Report under the Kyoto Protocol. Further submissions will follow, as will Australia efforts in negotiating a strong global agreement for a second commitment period from 2013.

31. P Wong (Minister for Climate Change and Water), Rudd Government helps businesses access the global carbon market, media release, 30 September 2009.
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