



**Australian Government**  
**Department of Climate Change**

AUSTRALIA'S NATIONAL  
**GREENHOUSE ACCOUNTS**



# The Australian Government's Initial Report under the Kyoto Protocol

Report to facilitate the calculation of the assigned amount of Australia pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol

Submission to the UNFCCC Secretariat

Published by the Department of Climate Change.

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Designed by Roar (DE&WR 4029)

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## INTRODUCTION

This report is a submission of the Australian Government to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) to facilitate the calculation of the assigned amount pursuant to Article 3, paragraphs 7 and 8, and to demonstrate its capacity to account for its emissions and assigned amount for the first commitment period under the Kyoto Protocol.

Australia's *National Inventory Report - 2005 Revised* was published on 26 February 2008 and provides a full time series of greenhouse gas emission estimates for Australia for the period 1990 - 2005. This inventory has been used to determine the estimate of Australia's assigned amount and has been submitted for international expert review.

### Requirements of the Initial Report

According to decision 13/CMP.1 (Modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol), the Initial Report is to consist of two parts. Part one of the report shall contain the following information, or references to such information where it has been previously submitted to the secretariat:

- (a) Complete inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for all years from 1990, or another approved base year or period under Article 3, paragraph 5, to the most recent year available, prepared in accordance with Article 5, paragraph 2, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP), taking into account any relevant decisions of the Conference of the Parties (COP);
- (b) Identification of its selected base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride in accordance with Article 3, paragraph 8;
- (c) The agreement under Article 4, where the Party has reached such an agreement to fulfil its commitments under Article 3 jointly with other Parties;
- (d) Calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, on the basis of its inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol.

Part two of the report shall contain the following information, or references to such information where it has been previously submitted to the secretariat:

- (a) Calculation of its Commitment Period Reserve in accordance with decision 11/CMP.1 (Modalities, rules and guidelines for emissions trading under Article 17 of the Kyoto Protocol);
- (b) Identification of its selection of single minimum values for tree-crown cover, land area and tree height for use in accounting for its activities under Article 3, paragraphs 3 and 4, together with a justification of the consistency of those values with the information that has been historically reported to the UN Food and Agriculture Organization or other international bodies, and in the case of difference, an explanation of why and how such values were chosen, in accordance with decision 16/CMP.1 (Land use, land-use change and forestry);
- (c) Identification of its election of activities under Article 3, paragraph 4, for inclusion in its accounting for the first commitment period, together with information on how its national system under Article 5, paragraph 1, will identify land areas associated with the activities, in accordance with decision 15/CMP.1 (Land use, land-use change and forestry);
- (d) Identification of whether, for each activity under Article 3, paragraphs 3 and 4, it intends to account annually or for the entire commitment period;
- (e) A description of its national system in accordance with Article 5, paragraph 1, reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol;
- (f) A description of its national registry, reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol.

The Department of Climate Change has developed its National Inventory Systems with the aim of conforming with the international specifications set out in COP Decision 19/CMP.1 Annex (reported in FCCC/KP/CMP/2005/8/Add.3) as part of its efforts to support the preparation of the *National Greenhouse Gas Inventory* and the *National Greenhouse Accounts* more generally.

The objectives of national systems for the estimation of emissions and removals include:

- > to enable parties to estimate emissions and removals and to report them in accordance with COP decisions;
- > to facilitate the review of inventory information; and
- > to assist parties to ensure and to improve the quality of their inventories.

This document aims to elaborate Australia's inventory institutions and inventory planning, preparation and documentation systems and to provide assurance as to the quality of Australia's national greenhouse accounts.

## PART 1: DETERMINATION OF THE ASSIGNED AMOUNT FOR AUSTRALIA

This section provides information required to support the estimation of Australia's assigned amount.

### 1.1 COMPLETE INVENTORIES OF ANTHROPOGENIC EMISSIONS BY SOURCE AND REMOVALS BY SINKS OF GREENHOUSE GASES NOT CONTROLLED BY THE MONTREAL PROTOCOL FOR ALL YEARS FROM 1990 TO THE MOST RECENT YEAR AVAILABLE

Australia's most recently completed inventory - the *National Inventory Report: 2005 Revised* - and associated Common Reporting Format Tables - was submitted to the UNFCCC on 26 February 2008. This *National Inventory Report* provides emissions estimates for the period 1990-2005 and is the basis for the determination of the assigned amount.

### 1.2 IDENTIFICATION OF THE SELECTED BASE YEAR FOR HYDROFLUOROCARBONS (HFCs), PERFLUOROCARBONS (PFCS) AND SULPHUR HEXAFLUORIDE (SF<sub>6</sub>)

Australia has elected to use 1990 as the base year for all of these gases.

### 1.3 AGREEMENT UNDER ARTICLE 4 OF THE KYOTO PROTOCOL

Australia will not be a participant in any Article 4 agreements.

### 1.4 CALCULATION OF THE ASSIGNED AMOUNT

Australia's assigned amount is determined to be 2 990 378.53 Gg from the data contained in Australia's *National Inventory Report: 2005 Revised*. Details of this calculation are provided in Table 1.

**Table 1:** Determination of Australia's assigned amount

AUSTRALIA'S EMISSIONS IN THE BASE YEAR (1990)	
Sector	Gg
Energy	286,799.12
Industrial Processes and Solvents	25,297.21
Agriculture	87,648.17
Waste	17,536.94
Land use change (Deforestation) <sup>a b</sup>	136,492.36
<b>Base year emissions estimate</b>	<b>553,773.80</b>
CALCULATION OF ASSIGNED AMOUNT	
<b>108% of base year estimate</b>	<b>598,075.71</b>
Australia's Assigned Amount (5 times 108% of base year estimate)	2,990,378.53

**Source:** Emissions estimates derived from Australia's *National Inventory Report - 2005 Revised*, Department of Climate Change, 2008. <sup>a</sup> According to Article 3.7, parties shall include emissions from Land Use Change in 1990 in their estimate of emissions in the base year used for the calculation of their assigned amount (only applicable to countries with a net LUCF emission in 1990, which is the case for Australia). <sup>1</sup> <sup>b</sup> Under the *1996 (Rev) IPCC Guidelines for the Preparation of National Inventories*, 'Land Use Change' is defined as including IPCC sectors 5.B-D. Subsequent to the Kyoto Protocol, the IPCC provided guidance on the mapping of these *1996 (Rev) IPCC Guidelines*' sectors to equivalent 'Land Use, Land Use Change and Forestry' categories - see the *IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry 2003* page 3.12. In Australia's reporting, 'Forest Lands Converted to Grasslands' and 'Forest Lands Converted to Croplands' categories under IPCC 2003 have been mapped back to 'Land Use Change' under the *1996 (Rev) IPCC Guidelines*. Consequently, the combined estimated net emissions from 'Forest Lands Converted to Grasslands' and 'Forest Lands Converted to Croplands' categories in Australia's *National Inventory Report 2005 Revised* are equal to the estimated emissions from 'Land Use Change' sectors as classified under the *IPCC 1996 (Rev) Guidelines*.

<sup>1</sup> According to the estimates contained in Australia's inventory current at the time of COP.3, Australia had a net LUCF emission in 1990. The Reports of COP-6 bis and COP-7 record Australia's eligibility under Article 3.7, second sentence. All of Australia's inventories submitted and reviewed since COP.3 consistently report a net LUCF emission in 1990.

## PART 2: ADDITIONAL INFORMATION ON AUSTRALIA'S NATIONAL INVENTORY

### 2.1 CALCULATION OF THE COMMITMENT PERIOD RESERVE

The Commitment Period Reserve is calculated to be 2 691 340.68 Gg (calculated as 90 per cent of the Assigned Amount reported in Table 1).

**Table 4:** Calculation of the Commitment Period Reserve

	Gg
<b>90% of the Assigned Amount</b>	2 691 340.68

### 2.2 IDENTIFICATION OF SELECTED VALUES FOR TREE CROWN COVER, LAND AREA AND TREE HEIGHT FOR USE IN ACCOUNTING FOR ACTIVITIES UNDER ARTICLE 3, PARAGRAPHS 3 AND 4

Australia has identified the following selected values for use in accounting for its land use, land use change and forestry activities under Article 3.3 and Article 3.4:

- > Tree crown cover: 20% canopy cover
- > Minimum land area: 0.2 hectares
- > Tree height: 2 metres

These characteristics align with the definitions of forest used by Australia in the compilation of its National Forest Inventories and in its reporting to the FAO. The definition has been extended to add a minimum area criterion, as required. The use of remote sensing techniques through the deployment of Australia's National Carbon Accounting System (NCAS) has facilitated the identification of forest cover to an area of 0.2 hectares.

### 2.3 ELECTION OF ACTIVITIES UNDER ARTICLE 3.3 AND 3.4 FOR ACCOUNTING IN THE PERIOD 2008-2012

Australia will use Australia's National Carbon Accounting System (NCAS) to identify land areas associated with the following activities under Article 3.3:

- > Deforestation or Land Use Change;
- > Afforestation and reforestation since 1990.

The NCAS is described in detail in Australia's *National Inventory Report - 2005 Revised* and in numerous publications cited in that document. Australia applies a

spatially explicit, time-series approach to track forest cover through time. This allows for the separate identification of land use changes from disturbance events and harvests, and also from any forest re-establishment.

Australia has not elected to account for any activities under Article 3.4.

### 2.4 IDENTIFICATION OF THE ACCOUNTING PERIOD (ANNUAL OR FOR THE PERIOD 2008-2012), FOR EACH ACTIVITY UNDER ARTICLE 3.3

Australia will report and publish annual estimates of emissions and removals from activities identified under Article 3.3.

### 2.5 DESCRIPTION OF AUSTRALIA'S NATIONAL INVENTORY SYSTEM

The Australian inventory is supported by a set of institutional arrangements which is designed to facilitate close co-ordination of the compilation of the inventory, efficient emissions data management, broadly based quality assurance processes and secure and reliable data collections.

The compilation of Australia's greenhouse gas inventory is undertaken by the Department of Climate Change (DCC) using the Australian Greenhouse Emissions Information System (AGEIS). The AGEIS centralises emissions estimation, inventory compilation, reporting and data storage processes into a single system. It has been used to consolidate Australia's emissions estimation methodologies and fully-integrated quality control procedures into the compilation process. The AGEIS provides high transparency levels for the inventory, with emissions data from the AGEIS database for the set of national inventory accounts publicly accessible through a dynamic web interface at [www.climatechange.gov.au/inventory](http://www.climatechange.gov.au/inventory).

The National Greenhouse Gas Inventory Committee, which comprises representatives of the Australian, State and Territory governments and which has been in place since the early 1990s, is the principal mechanism of review for the report prior to its release. The report is also circulated prior to submission to other Australian government departments and agencies and relevant state experts through the National Greenhouse Gas Inventory Committee.



Originally, expert working groups developed the Australian emission estimation methodologies. Their work has been subsequently reviewed by a wide range of technical experts in research institutions, governments and industry on a rolling basis and in accordance with the DCC's Inventory Improvement Plan. Key modifications or refinements to the methodology are adopted following consultation with the National Greenhouse Gas Inventory Committee.

Reliability of data collection processes is an important consideration for inventory preparation to ensure accurate and time series-consistent emissions data. The Australian inventory is well served in this regard. The major sources of activity data are published by key national economic statistics agencies: - the Australian Bureau of Statistics (ABS) and the Australian Bureau of Agricultural and Resource Economics (ABARE).

The DCC has instituted an annual cycle of evaluation through the preparation of an *Evaluation of Outcomes* document, providing a process for quality assurance and feedback for improvement to the *National Greenhouse Accounts*. The Accounts are assessed against explicit quality objectives which take into account, *inter alia*, detailed estimates of uncertainty surrounding Australia's emissions data; UNFCCC Expert Review processes, which aim to review and improve the quality of all Annex I inventories in an open and facilitative manner on an annual basis; and an assessment of Australia's estimation methodologies against IPCC guidelines, international practice and available data.

The AGEIS is facilitating the continued development of the *National Greenhouse Accounts* for Australia with the aim of providing additional information for users and has the benefit of enhancing the transparency, consistency and comparability of the national inventory. The national emissions accounting framework which supports the construction of the accounts is set out in section 2.5.6.

### Features of the Australian System

- \* The National Greenhouse Gas Inventory is embedded within an integrated set of national greenhouse accounts
- \* The DCC acts as the single agency designated to compile the inventory
- \* Inventory processes are sufficiently resourced, staffed and trained
- \* The DCC has invested in purpose-built software - the AGEIS and the NCAS - for estimation, quality control and archiving of emissions and input data and methodology
- \* Transparency has been maximised through the release of a publicly accessible interactive emissions database at [www.climatechange.gov.au/inventory](http://www.climatechange.gov.au/inventory) and documented estimation methodologies
- \* Input data collection is supported by Australia's major economic statistics organisations, supplemented by DCC collections for certain sectors
- \* The inventory has been developed under a continuous improvement plan, with prioritization of resources allocated to key categories with relatively high uncertainty (in particular, Land Use, Land Use Change and Forestry (LULUCF))
- \* The Inventory is developed in accordance with a QA/QC Plan that provides for regular review, including by independent international experts through the UNFCCC Expert Review Teams

A description of Australia's national inventory system against the elements detailed in CMP.15 paragraph 30 is provided in the following sub-sections. The requirements of national inventory systems are also set out in Decision 19/CMP.1 Annex within FCCC/KP/CMP/2005/8/Add.3. Cross references to the relevant parts of that Decision in the following discussion are summarised in Table 5. More details are provided in the *National Inventory Report - 2005 Revised*.

**Table 5** Detailed cross referencing of national inventory system characteristics

Decision 19/ CMP.1 Annex paragraph number	Description of national inventory system characteristic	Cross reference to this document
<b>General functions</b>		
10a	Establish and maintain the institutional, legal and procedural ...	Section 2.5.2
10b	Ensure sufficient capacity	Section 2.5.2
10c	Designate a single national entity	Section 2.5.2
10d	Prepare national annual inventories	See Section 2.5
10e	Provide information necessary to meet the reporting requirements defined in the guidelines under article 7	See Section 2.5
<b>Specific functions</b>		
12a	Designate a single national entity	Section 2.5.2
12b	Make available postal and electronic addresses	Section 2.5.1
12c	Define and allocate specific responsibilities	Section 2.5.2
12d	Elaborate a QA/QC plan	Section 2.5.6
12e	Establish process for official consideration	Section 2.5.7
13	Improve quality of the inventory	Section 2.5.5
14a	Identify key source categories	Section 2.5.4
14b	Prepare estimates in accordance with methods described by the IPCC	Section 2.5.3
14c	Collect sufficient activity data to support the methods	Section 2.5.3
14d	Estimate inventory uncertainty	Section 2.5.5
14e	Ensure recalculations are prepared in accordance with IPCC guidance	Section 2.5.5
14f	Compile the national inventory in accordance with Article 7 and COP decisions	See Section 2.5
14g	Implement general inventory QC (tier 1) procedures in accordance with the QA/QC plan	Section 2.5.6
15a	Apply source specific QC (tier 2) procedures	Section 2.5.6
15b	Provide for basic review of the inventory by personnel not involved in the inventory development	Section 2.5.6
15c	Provide for more extensive review for key source categories	Section 2.5.6
15d	Re-evaluate inventory planning process in order to meet quality objectives established under 12d	Section 2.5.6
16a	Archive inventory information	Section 2.5.3
16b	Provide access to review teams to archived information	NA. In practice, compliance.
16c	Respond to requests for additional information	NA. In practice, compliance.
17	Gather archived information at a single location	Section 2.5.3

### 2.5.1 Name and Contact Information for the National Entity

The entity responsible for the national inventory system is the Department of Climate Change, Australian Government. The designated representative with overall responsibility for compiling the national inventory is:

Rob Sturgiss  
 Manager  
 Inventory Unit  
 Department of Climate Change  
 GPO Box 854  
 Canberra ACT 2601  
 AUSTRALIA  
 or electronically at [ageis@climatechange.gov.au](mailto:ageis@climatechange.gov.au)

### 2.5.2 Roles and responsibilities in relation to inventory development processes as well as institutional, legal and procedural arrangements

This section sets out the main components of Australia's National System which address the specific elements of Decision 19/CMP.1 Annex paragraphs 10(a) and 10(c) and paragraphs 12(a), 12(c) and 12(e).

#### 2.5.2.1 Single Agency

The compilation of *Australia's National Greenhouse Accounts* is undertaken centrally by a single agency, the Department of Climate Change (DCC) within the Australian Government. 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.

Australia's National Greenhouse Gas Inventory is prepared under the Australian Government's Emissions Measurement and Analysis Program. The program supports the Inventory, the DCC's emissions projections activity; and the NCAS, which is designed, *inter alia*, to estimate greenhouse emissions and removals from the Land Use, Land Use Change and Forestry sector.

The DCC maintains a unit of five staff to manage the National Inventory Systems required to deliver *Australia's National Greenhouse Accounts*. Support for the DCC inventory staff comprises a pool of 16 expert consultants from which the DCC selects experts to undertake specific inventory preparation and review tasks. The pool is designed to foster a broad base of understanding of

Australia's inventory systems and also to ensure that the DCC meets the competition principles of the Australian Government's procurement guidelines.

In the Land Use, Land Use Change and Forestry Sector, contributors engaged in the inventory process include analysts such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO); the Co-operative Research Centre for Spatial Information, universities, State Government research organisations and private sector providers. Various roles are fulfilled from data generation to quality assurance and validation.

DCC staff and external consultants have extensive experience in inventory preparation. The DCC aims to maximise the number of staff that have been trained in order to qualify for the UNFCCC Roster of Experts for review of national inventories and to participate in UNFCCC Expert Review Team processes. All senior staff have been accepted onto the UNFCCC Roster of Experts and the DCC has strongly supported the participation of Australian experts in UNFCCC review exercises.

The DCC utilises activity data published by Australia's principal economic statistics agencies: ABARE and the ABS. The Australian Bureau of Statistics (ABS) is the national statistical agency with legislative backing for its collection powers. It is the source of agricultural activity and some energy related data. The energy consumption data are sourced from the ABARE, which publish data from a survey of energy use that has operated for 30 years and which are used to fulfill Australia's reporting requirements to the International Energy Agency.

#### 2.5.2.2 Centralised Emissions Estimation

Estimation of emissions is conducted by the DCC utilising the AGEIS and, for Land Use, Land Use Change and Forestry estimates, the NCAS. Emission methodologies selected are consistent with those identified by the IPCC 2003, IPCC 2000, IPCC 1997 and are being continually improved under the Inventory Improvement and NCAS Development Plans. All other activities associated with the preparation of the emission estimates are co-ordinated by the DCC.

### 2.5.2.3 Inventory planning and preparation cycle

Key steps in the DCC's annual inventory preparation process (with indicative dates in parentheses) are determined by the needs of the system and output and quality objectives. The timing is determined by the UNFCCC Submissions timelines and data availability. Steps 1-18 provide an overview of the general inventory cycle. The cycle commences with a review of emission estimation methods, the allocation of tasks and selection of external consultants, and the preparation of the AGEIS for the compilation of the forthcoming inventory. The cycle is completed by external independent review provided by the UNFCCC Expert Review Teams.

#### DCC planning and methodology improvement

1. Preparation of Evaluation of Outcomes document for the previous year.
2. Preparation of QA-QC and *Inventory Improvement plans*, taking into account DCC review of methodologies, activity data and UNFCCC expert review recommendations.
3. Selection of expert consultants for preparation and review processes (May-June).
4. Development of investment and maintenance plan for the AGEIS (June).
5. Methodology development & review. Incorporation into AGEIS (June - October)

#### Data collection and entry

6. Activity data collection conducted annually by a panel of external consultants and by the DCC (June - October). Heavily reliant on published data from Australia's premier economic statistics agencies and subject to quality control checks.
7. Activity data entry into the AGEIS input database - by the DCC through predefined data entry templates (August - November).

#### Data verification

8. Activity data verification and quality control - the DCC uses the AGEIS to systematically report a range of diagnostic statistics on the activity data to facilitate identification and correction of anomalous entries to

ensure time-series consistency and consistency across sectoral emissions estimates.

9. A designated analyst (known as a Supervisory user) investigates anomalies and records an assessment of the quality of the activity data in the system.
10. The data quality is checked and internally audited by a designated analyst (known as the Database Operations Manager (DOM) to provide quality control. Only when the DOM is satisfied is the input data transferred to the core database where emissions estimation are undertaken.

#### DCC Emission estimation

11. The AGEIS is used to generate emission estimates for all inventory years using time-series consistent methodologies.

#### Emission and report review

12. Emissions estimates verification – the DCC analysts repeat the range of tests on emissions estimates generated by the AGEIS to ensure time-series consistency and consistency across sectoral emissions estimates and accuracy of recalculations.
13. Checking and internal audit procedures on emission estimates by designated DCC staff to provide QC (DOM and the "Emissions Analysis Team Manager").
14. The compiled inventory is circulated to Australian Government departments and the NNGI Committee of State and Territory government representatives for comment prior to public release (February).

#### Report publication

15. Automated population of reporting (CRF) tables (February).
16. The inventory is available for public release.
17. Release of Australia's National Greenhouse Accounts and release of the AGEIS database of emission estimates and background data at [www.climatechange.gov.au/inventory](http://www.climatechange.gov.au/inventory) (April-May).
18. UNFCCC Expert Review of the National Inventory Report and CRF Tables (August-November).

### 2.5.3 Description of the process for collecting activity data, or selecting emission factors and methods, and for the development of emission estimates

#### 2.5.3.1 Data collection

Data collection to support the preparation of the *Accounts* is managed centrally by the DCC, utilising a mix of approaches to ensure the reliable flow of data from other agencies to support inventory preparation.

Current activity data collection processes are well-integrated with the objectives of other programs, with a strong reliance on data collected and published by Australia's principal economic statistics agencies: the ABS and ABARE. As noted above, the ABS is the national

statistical agency with legislative backing for its collection powers and the source of agricultural activity and some energy related data. ABARE has collected and published data from a survey of energy use for 30 years with the purpose, in part, of fulfilling Australia's reporting requirements to the International Energy Agency.

For industrial processes, the DCC employs consultants to collect data directly from companies. Company co-operation with the DCC survey is high. The collection of solid waste data from State and Territory Government agencies is supported by an exchange of letters between Australian and State Government agencies.

**Table 6:** Current principal data sources and collection mechanisms for the estimation of Australia's national greenhouse gas inventory

Category (UNFCCC sector)	Principal activity data sources	Principal collection mechanism
<b>Energy sector (1A1, 1A2, 1A4, 1A5)</b>	ABARE, DCC collections	Published DCC programs, Voluntary DCC survey
<b>Energy sector, (1A3)</b>	ABARE, ABS	Published
<b>Energy sector (1B)</b>	Coal Services Pty Ltd, Australian Petroleum Exploration Association	Published
<b>Industrial processes (2) and solvents (3) HFCs</b>	DCC collection Australian Government Department of Environment, Water, Heritage and the Arts	DCC survey Mandatory reporting under import licensing arrangements
<b>Agriculture (4)</b>	ABS	Published
<b>Land Use Change and Forestry (5)</b>	NCAS, ABARE	DCC
<b>Waste (6)</b>	State and Territory government waste agencies	Exchange of letters between government agencies

### Future data collection framework

The *National Greenhouse and Energy Reporting Act 2007 (the NGER Act 2007)* establishes the legislative framework for a national greenhouse and energy reporting system. This legislation was introduced to the Australian Parliament on 15 August 2007 and received Royal Assent on 28 September 2007.

The reporting system established by the *NGER Act 2007* is designed to ensure:

- > Australia's international reporting obligations are met;
- > robust and transparent emissions reporting for the Australian Emissions Trading System; and
- > a single streamlined national reporting point for greenhouse gas emissions and energy data to assist Commonwealth, State and Territory government programs and activities.

The *NGER Act 2007* will make reporting mandatory for companies whose energy production, energy use, or greenhouse gas emissions (from the energy, industrial process and waste sectors) meet certain thresholds (25 kt). In large part mandatory reporting under the *NGER Act 2007* will replace existing DCC voluntary data collections and become the mechanism for ABARE energy data collections.

The first reporting period under the *NGER Act 2007* will be 2008-09.

The *NGER Act 2007*, updated information on the national greenhouse and energy reporting system, and details of previous public consultation on the *NGER Act 2007*, can be accessed at: [www.climatechange.gov.au/reporting](http://www.climatechange.gov.au/reporting).

#### 2.5.3.2 Estimation methods: consistency with IPCC Good Practice

Emission methodologies selected are consistent with those identified by the IPCC 2003, IPCC 2000, IPCC 1997 and are being continually improved under the Inventory Improvement and NCAS Development Plans. In general, Australia uses tier 2 methods for the estimation of emissions. The methods selected are appropriate and consistent with IPCC Guidelines and, where possible, make use of capital stock models; disaggregated, dynamic models and country-specific parameters where available. In important sectors in the Australian inventory, like forest conversion, Australia deploys Tier 3 models to provide the best possible emissions estimates.

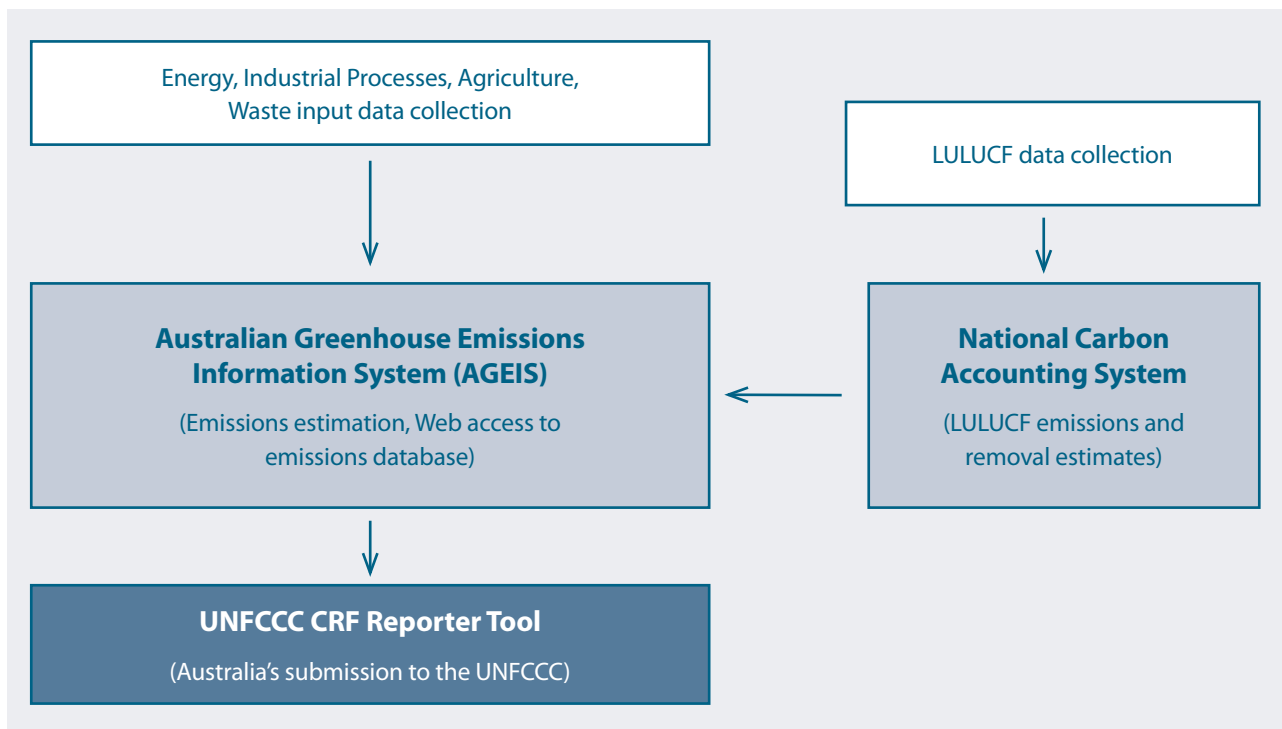
The full description of the methods used by Australia in the estimation of emissions is provided in the series *Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006* and in the *National Inventory Report - 2005 Revised*.

#### 2.5.3.3 Australian Greenhouse Emissions Information System

The DCC introduced the AGEIS into the inventory production process in 2005. The system is designed to receive input and activity data; generate emissions estimates; and then to provide secure access to the public to the emissions database. The AGEIS is integrated with the UNFCCC CRF Reporter Tool enabling the smooth transfer of emissions data to the UNFCCC with the aim of improving the timeliness and quality of Australia's inventory submissions.

While the AGEIS is used for final preparation of the *National Greenhouse Accounts*, the NCAS plays a critical role in delivering the emission and removal estimates for the Land Use, Land Use Change and Forestry sector.

**Figure 1:** DCC inventory asset structures and relationships



**2.5.3.4 Archival and Documentation Systems**

The Australian documentation systems aim to both manage and retain all data used in the estimation of emissions and to provide a means for knowledge management to ensure continuity and security of the National Inventory Systems. This section addresses the specifications of Decision 19/ CMP.1 Annex paragraphs 16 and 17.

The AGEIS is at the heart of Australia’s documentation systems as it allows efficient electronic data management and archiving of the significant quantities of data needed to generate an emissions inventory. AGEIS data management functions include:

- > Archival and storage within the AGEIS database of the emissions estimates of past Submissions;
- > Archival and storage within the AGEIS of past activity data, emission factor and other parameters and models;

- > Archival and storage of data source descriptions; methodology descriptions and source reference material; and
- > Integrated access to the documentation of data sources; methodology description and source reference material.

The aims of these systems include giving inventory staff ready access to all related materials that underpin the emissions estimates and to provide the means for replication of emission estimates from past submissions.

The AGEIS functions are supported by some additional and important elements of the documentation system:

- > Documentation of the inventory’s emission estimation methodologies;
- > Maintenance of a National Inventory library of source material documents.

Australia's estimation methodologies are documented both in the *National Inventory Report* and in a comprehensive series *Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks*. This series covers each UNFCCC sector in detail. The 2006 Inventory will be accompanied by a revised and updated series, *Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006*. These titles include:

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Energy (Stationary Sources)*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Energy (Transport)*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Energy (Fugitive Fuel Emissions)*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Industrial Processes*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Solvents*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Agriculture*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Land use, land use change and forestry*

*Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks 2006: Waste.*

#### **2.5.4 Description of the process and results of key category identification**

This section also addresses the requirements of Decision 19/CMP.1 Annex paragraphs 14(a) and 14(b) which requires the identification of key categories, and the use of appropriate methods for the estimation of emissions from key source categories.

The identification of key categories is necessary to ensure prioritisation of research efforts and the use of appropriate methods - generally more complex, higher tier methods which in principle will provide more accurate emission estimates. The full analysis of the key categories of the Australian inventory is available in the *National Inventory Report - 2005 Revised*. Australia's most important key categories include public electricity (solid fuel); forest conversion to grasslands; enteric fermentation (sheep) and road transportation (passenger cars).

#### **2.5.5 Description of the process for the recalculation of previously submitted inventory data**

Inventory estimates are periodically recalculated. Decision 19/CMP.1 Annex paragraph 13 states that, as part of inventory planning, ways should be considered to improve the quality of activity data, emissions factors, methods and other relevant technical elements of inventories. To ensure time series consistency, any changes in methods or emission factors must be applied to the time series of estimates for the period since 1990.

The scope of planned future refinements of the Australian inventory are set out in the *Inventory Improvement Plan* and is informed by the ongoing technical review of sectoral methodologies and data sources undertaken by the DCC as part of Australia's efforts to comply with inventory good practice.

Priorities for the inventory development process are informed by:

- > *the need to reduce uncertainty of the national emission estimates* - a formal UNFCCC reporting requirement includes the estimation of the level of uncertainty of the national inventory as a whole. The estimated uncertainty for the national inventory is reported in DCC (2008). The Inventory Improvement Plan is aimed at reducing these uncertainties as much as possible, with development focused on key categories; sources with high uncertainties; and where implementation of new methods is feasible (eg new data has become available);
- > *responses to international reviews;*
- > *changing international practice and changing IPCC methodologies* - changing international practices and new guidelines that have been developed under the 2006 IPCC National Inventory Guidelines may provide opportunities to refine Australia's methodologies; and
- > *the need to continue to review completeness of the inventory and to identify and estimate minor additional sources:* this part of the Inventory Improvement program has steadily enhanced the overall completeness of the inventory. The impacts of these new sources are minor (around 1% of the total inventory) and have had negligible impact on overall emission trends or on overall uncertainty of the inventory.



All improvements to methods or data require recalculations of emissions estimates for the entire time series, from 1990 onwards, to ensure time-series consistency of emission estimates. These recalculations are conducted in accordance with IPCC Guidelines and are reported in Australia's National Inventory Reports.

Short-term tasks have been identified in some but not all IPCC sectors in response in part to previous UNFCCC reviews and ongoing efforts to enhance overall completeness. Longer-term tasks that have been identified are focused in the Agriculture, Forestry and Land Use Change sectors where payoffs from reduced uncertainty for the overall inventory are expected to be highest.

Significant methodological development has been undertaken in the last two years under the current funding of the inventory aspect of the Emissions Measurement and Analysis program and has had the following broad aims:

- > Increased use of capital stock models over simple activity data models;
- > Increased emphasis on spatial disaggregation of models, in particular state-based models;
- > Increased use of country-specific parameters; and
- > Increased use of dynamic models - where current emissions depend on past activity data.

Together, these developments have ensured a significant enhancement in the level of dynamic complexity of the estimation methodologies across the national inventory with the aim of enhancing the level of user confidence in the emission estimates.

Outside the land based sectors, future inventory development will focus on moving to higher tier methods across the Inventory as new site-specific data becomes available from reporting under the *NGER Act 2007* (the first reporting period will be 2008-09).

The NCAS is being developed to systematically address key sectors in the Land Use Change & Forestry and Agriculture sectors. The work plan for the NCAS is detailed in AGO (2005).

## 2.5.6 Quality Control and Assurance Plans

Australia's National Inventory Systems QA/QC processes are outlined in *Australia's National Greenhouse Accounts: QA-QC Plan 2006-07*, which aim to conform with *IPCC Good Practice Guidance*, and to contribute to the production of inventories that are accurate, in which uncertainties are reduced to the extent practicable, and in which the inventories are transparent, documented, consistent over time, complete and internationally comparable.

The IPCC defines quality control as being a system of routine technical activities to measure and control the quality of the inventory as it is being developed. A basic QC system should provide routine and consistent checks to ensure data integrity, correctness, and completeness, identify and address errors and omissions, and document and archive inventory material and record all QC activities.

Quality assurance comprises a planned system of review procedures conducted by personnel not directly involved in the inventory compilation and development process.

This section outlines the major elements of the DCC's QA/QC plan for the national greenhouse gas inventory and representative details of the plan's implementation. It addresses the elements of Decision 19/CMP.1 Annex paragraphs 12(d), 13, 14(g), 15(a), 15(b), 15(c) and 15(d).

### 2.5.6.1 Quality Control Systems

The key elements of the DCC quality control structures include:

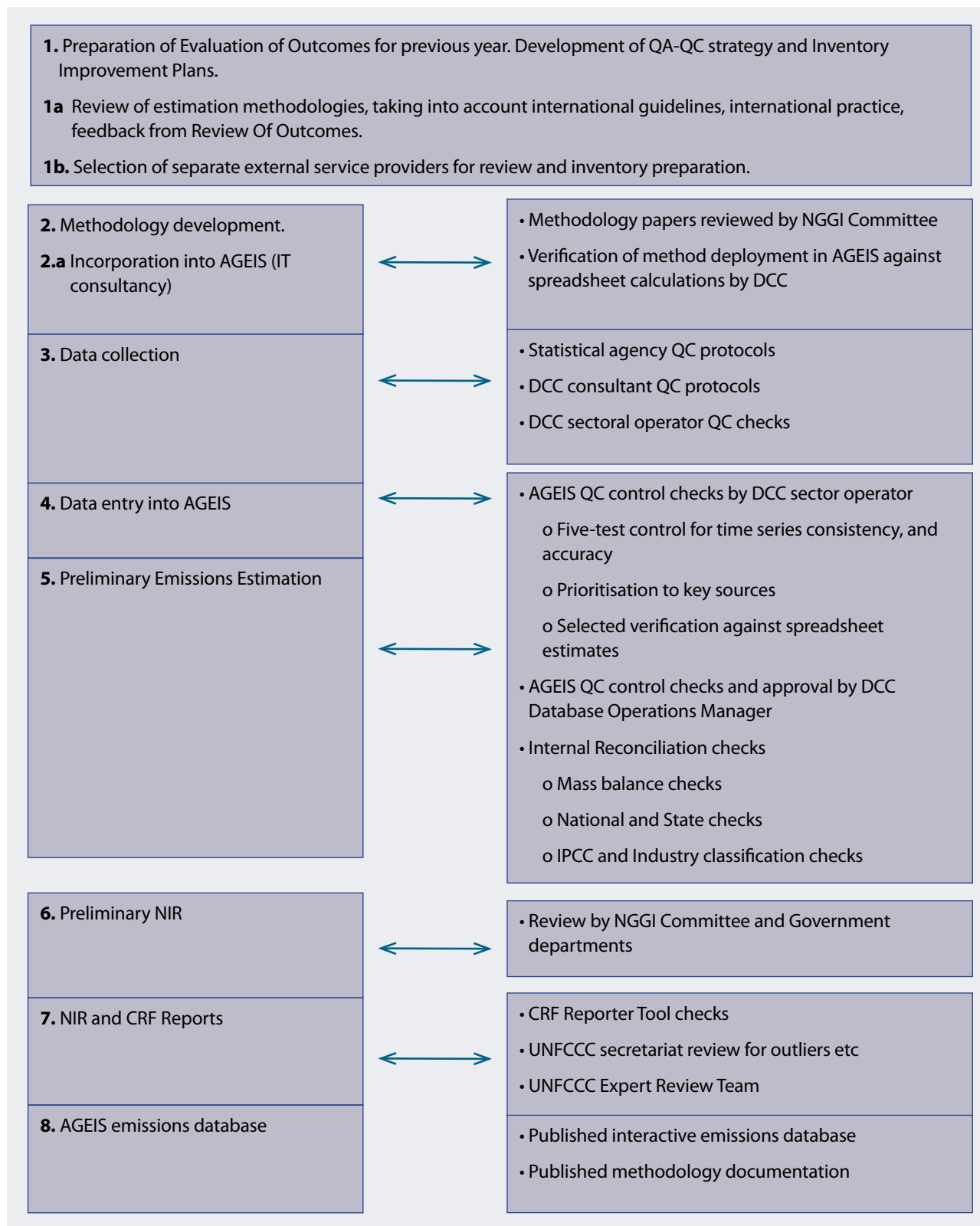
- > establishment of explicitly-defined quality objectives for the *National Greenhouse Accounts*;
- > **automated and systematised** quality control processes built within the AGEIS for all data handling and emission estimation procedures, principally aimed at ensuring time series consistency and accuracy;
- > **prioritisation** of quality control processes built within the AGEIS to ensure effort is principally directed toward key categories;
- > **separation** of data handling and data approval roles within the DCC to improve accountability;
- > **auditability** of QC controls to improve accountability;

- > additional reconciliation checks for emissions data with reference to Australia's national greenhouse accounts structure - national emission estimates are reconciled with the aggregation of State and territory emission estimates; and IPCC emission estimates are reconciled with economic sector classification estimates;
- > additional reconciliation checks for emissions data to ensure **completeness** of activity data for fossil fuels and carbonates.

The ultimate objectives of the QA/QC activities are to ensure that the national inventory is of high-quality, transparent and amenable to review. To this end, the DCC has established quality objectives for the national greenhouse account emission estimates and for the National Inventory Report itself. The quality indicators comprise a mix of self-assessment (ie by the DCC itself) and external assessment (in particular, by external consultants, the National Greenhouse Gas Inventory Committee, and the UNFCCC Expert Review Teams).

The AGEIS plays a key role in facilitating the quality control of the national inventory. Key Tier 1 QC procedures for the inventory compilation process have been systematically built into the operation of the AGEIS. Standardised and auditable checks are undertaken *inter alia* to reduce the risks of errors associated with the input of activity data, missing data, the implementation of estimation methodologies, recalculations and the time series consistency of generated emission estimates. Implied emission factors are checked for time-series consistency prior to submission. Statistical analysis of Australia's implied emission factors in comparison with those of other Annex I parties are also undertaken during the evaluation process.

**Figure 2:** Overview of the principal annual QA/QC processes utilised for each step in the preparation of National Inventory data



Tier 2 QC checks are sector-specific QC exercises and comprise emission factor and activity data review.

#### 2.5.6.2 Quality Assurance Systems

Australia's quality assurance systems utilises a mix of approaches which, when taken together, provide a powerful incentive structure for maintaining and enhancing the overall quality of the inventory. These quality assurance actions are undertaken by individuals not involved in the preparation of the inventory.

- 1) The national greenhouse inventory is reviewed each year by the National Greenhouse Gas Inventory Committee and by Australian Government departments prior to its release.
- 2) Specific reviews of sectoral methodologies are regularly performed by expert consultants that are not involved in the inventory preparation process. For example, in 2007, external consultants were contracted to review the industrial processes, steel, petroleum refining, solid waste, industrial wastewater and waste incineration methodologies
- 3) A wide range of QA processes have been employed for the NCAS;
- 4) *Uncertainty* estimates were reviewed in 2005 by the CSIRO Atmospheric Research Division according to strict review protocols.
- 5) The *transparency* of inventory emission estimates and methods published by the DCC ensures that the inventory is open to public review each year.
- 6) *UNFCCC expert review team processes* provide a level of scrutiny that provides valuable input into the overall quality of the inventory. Australia has sought to have the inventory reviewed by in-country international expert teams where possible - in 2002 and 2005 - while there have been centralised reviews in other years.

Australia is committed to ensuring that the inventory data and methods are transparently reported as a means to ensuring that strong incentive structures are in place to maintain inventory quality. The emissions data for the Australian inventory is openly and transparently reported and made accessible on the AGEIS webpage. All emissions data reported to the UNFCCC, and also component emission estimates are accessible through an interactive search facility. Data are downloadable by the public through an

email export function from the AGEIS. Industry and public feedback is encouraged through an email facility to the inventory contact point [ageis@climatechange.gov.au](mailto:ageis@climatechange.gov.au).

#### 2.5.6.3 Other related controls: the National Greenhouse Accounting Framework

The DCC has embedded the national inventory within a set of national emission accounts that provides more information for users and additional quality control for the inventory in terms of enhanced consistency, transparency and comparability.

The DCC produces emissions estimates at national and state levels and provides the framework and methods for the estimation of emissions at company and site levels. The relationships between the emission estimates of each of these quite different types of applications can be defined through the specification of a national accounting framework. This yields:

- > a basis for consistent classification of emissions data (ie the allocation of data within a complete, non-overlapping framework at national, state, company and site levels);
- > enhanced confidence of users in inventory data by improving the comparability and consistency of emission estimates;
- > enhanced potential for aggregation, multiple use and streamlining of data collection by government; and
- > additional information on Australia's emissions that is regularly demanded by stakeholders and public users of emissions data.

The *National Inventory Report* is the cornerstone of the national greenhouse accounts. It enables Australia to meet its international reporting obligations and provides information at a sectoral level according to the classification system of the IPCC.

The IPCC classification, however, was designed with ease of estimation and verification of national emissions in mind. It does not always reveal information that readily relates to all of entities with which policy makers commonly deal. Consequently, complementary classifications of emissions within the national inventory that better address the needs of users are needed.

The classifications for the accounting framework is described by a set of integrated national accounting identities centred on the national emissions inventory (see Box). For the most part the classifications would be analogous to those used in national income account systems. Accounts published each year include:

- > *National Inventory Report*, meeting the Government's reporting requirements under the UNFCCC
- > *National Greenhouse Gas Inventory*, providing a national report utilising IPCC classifications;
- > *State and Territory Inventories*, providing estimates utilising IPCC classifications reporting for Australia's eight state and territory jurisdictions; and
- > *National Inventory by Economic Sector*, providing estimates utilising Australian and New Zealand Industry Classifications (ANZSIC), reporting for national and state jurisdictions.

#### **BOX: AN INTEGRATED FRAMEWORK OF NATIONAL EMISSION ACCOUNTS**

##### **Direct source accounts**

###### (1) BY IPCC CLASSIFICATIONS

NGGI = Energy + Fugitives + Industrial processes + Agriculture + LULUCF + Wastes

###### (2) BY JURISDICTION

NGGI =  $\Sigma$  State inventories or  $\Sigma$  local government area inventories

###### (3) BY ECONOMIC TRANSACTOR

NGGI =  $\Sigma$  Corporations +  $\Sigma$  Households +  $\Sigma$  General Government

###### (4) BY FACILITIES

NGGI =  $\Sigma$  Facilities

###### (5) BY ECONOMIC SECTOR

NGGI =  $\Sigma$  Industry sectors (ANZSIC codes) +  $\Sigma$  Households +  $\Sigma$  General Government

###### (6) INDIRECT 'SCOPE 2' ACCOUNTS

NGGI Electricity Sector =  $\Sigma$  Indirect emissions defined by the WRI/WBCSD 'Scope 2'

The major classifications can be grouped according to source of emissions or by indirect emissions.

##### **(1) IPCC classifications**

The *National Greenhouse Gas Inventory* is compiled according to IPCC classifications. The reporting structures provide for disaggregated emission reporting according to type of emission process and by sector, as defined by the IPCC. These divisions are designed to facilitate estimation of emissions.

##### **(2) National accounts, classified by jurisdiction**

The national inventory may be divided into estimates of emissions from sub-jurisdictions. The national inventory should equal the sum of State and Territory accounts. As for the national inventory, estimates are of emissions generated at the source of the production activity within a jurisdiction's border.

##### **(3) National accounts, classified by type of economic transactor (institutional sector in national income account systems)**

The national inventory emissions may be disaggregated by emissions generated by type of organisational economic unit. Following the national income account classifications, organisations in the economy may be grouped into three institutional sectors:– corporations, households; and general government. In principle, the national inventory would equal the sum of the inventories of corporations, households and general government. The framework of the integrated greenhouse accounts has been applied in the specification of emission estimation guidelines for companies reporting under the NGER Act 2007.

##### **(4) Facilities**

Consistent with the approach to estimation of emissions by corporations, the framework of the integrated accounts has been applied in the specification of emission estimation guidelines by companies under the NGER Act 2007.

**(5) National accounts, classified by economic sector**

The level of emissions from corporations may be allocated by sector and industry (using Australia and New Zealand Standard Industry Classification (ANZSIC) codes). In this structure, for example, emissions from agriculture include all emissions sourced from the activities of agricultural establishments including from the combustion of fossil fuels, enteric fermentation and deforestation etc. Consequently, these sectoral estimates provide a better indication of total emissions generated by type of economic activity than do the IPCC sectoral classifications.

**(6) Indirect emissions**

The estimation of indirect emissions from electricity consumption provide an account for emissions associated with demand for electricity where each indirect emission has a counterpart in a direct emission within an electricity generator's or distributor's account. A national account of indirect emissions has been constructed which is equal to an account of direct emissions associated with the production of that electricity. These estimates are also released in the *National Inventory by Economic Sector Report* and are published on the DCC website and emissions database.

**2.5.7 Process for official consideration and approval of the inventory and responses to inventory review processes**

The *National Inventory Report* is prepared by the DCC. Prior to finalisation, each annual report is considered by the National Greenhouse Gas Inventory Committee, which comprises representatives of the Australian, State and Territory governments and has been in place since the early 1990s. The Committee is the principal mechanism of review for the *National Inventory Report* prior to its release. The *National Inventory Report* is also circulated prior to submission to other Australian government departments and agencies and relevant state experts through the National Greenhouse Gas Inventory Committee.

Release of the inventory and submission to the UNFCCC is approved by the Australian Government Minister for Climate Change and Water. Responses to inventory review processes are the responsibility of the designated representative.

**2.6 DESCRIPTION OF AUSTRALIA'S PLANNED NATIONAL REGISTRY, IN ACCORDANCE WITH THE GUIDELINES UNDER ARTICLE 7 OF THE KYOTO PROTOCOL**

The development of a national registry is still under consideration by the Australian Government. It is Australia's intention to develop a national registry to support allowance trading under both the Kyoto Protocol and the Australian Emissions Trading Scheme, and to have the national registry operational in accordance with the timelines specified under the Kyoto Protocol. The Government plans to enact legislation for emissions trading in 2009 that will, among other things, establish the national registry and its administrator.

The DCC is responsible for the implementation of the national registry under the Kyoto Protocol. The DCC will conduct an open tender to procure a national registry in 2008. The necessary documents are currently being prepared and the funding being allocated. The registry will be a "best practice" electronic database that is publicly accessible through a web-based user interface. Following review of the registry by the UNFCCC and initialisation with the International Transaction Log, Australia plans to have the registry operational in 2009.

The description of Australia's planned national registry follows the reporting guidance set down in Decision 15/ CMP.1, part II (Reporting of supplementary information under Article 7, paragraph 1, E. National registries) under the Kyoto Protocol.

**2.6.1 Name and contact information of the registry administrator designated by the Party to maintain the national registry**

Stephen Bygrave  
 Registry Administrator  
 Emissions Trading Division  
 Department of Climate Change  
 GPO Box 854  
 CANBERRA ACT 2601  
 Tel: +61 2 6274 1888  
 Email: registry@climatechange.gov.au

### **2.6.2 Names of any other party with which the party cooperates by maintaining their respective registries in a consolidated system**

The Australian national registry is not currently planned to be operated in a consolidated system with any other party's registry, but compatibility with other countries' registries is being considered.

### **2.6.3 A description of the database structure used in the national registry**

Details of the database structure will be determined on the selection of a provider from the tender for a national registry in 2008.

### **2.6.4 A description of how the national registry conforms to the technical standards for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, the clean development registry and the independent transaction log, including (i) to (vi) below**

At this stage, the Australian registry is likely to be developed for the purposes of allowance trading under both the Australian Emissions Trading Scheme and the Kyoto Protocol which would require the national registry to be compliant with the UN Data Exchange Standards (DES) specified for the Kyoto Protocol.

The registry will be developed in accordance with the standards specified in the UN DES document, Version 1.1. Development of connection, initialisation and testing with the International Transactions Log will commence in the second half of 2008. Registry functionality and documentation will include back-up procedures and a disaster recovery plan.

**(i)** A description of the formats used in the national registry for account numbers, serial numbers for ERUs, CERs, AAUs, and RMUs, including project identifiers and transaction numbers

Formats will be as specified in the UN DES Version 1.1 Annex F — Definition of Identifiers.

**(ii)** A list, and the electronic format, of the information transmitted electronically when transferring ERUs, CERs, AAUs, and/or RMUs to other registries

Information will be transmitted to other registries in the format of the messages specified in the UN DES Version 1.1 via the ITL.

**(iii)** A list, and the electronic format, of the information transmitted electronically when acquiring ERUs, CERs, AAUs, and/or RMUs from other national registries or the CDM registry

Information will be transmitted to other registries in the format of the messages specified in the UN DES Version 1.1 via the ITL.

**(iv)** A list, and the electronic format, of the information transmitted electronically from the national registry to the independent transaction log when issuing, transferring, acquiring, cancelling and retiring ERUs, CERs, AAUs, and/or RMUs

Information will be transmitted to the ITL in the format of the messages specified in the UN DES Version 1.1.

**(v)** An explanation of the procedures employed in the national registry to prevent discrepancies in the issuance, transfer, acquisition, cancellation and retirement of ERUs, CERs, AAUs, and/or RMUs

A full set of procedures will be developed, documented and included in the tender requirements for an Australian registry.

**(vi)** An overview of the security measures employed in the national registry to deter unauthorised manipulations and minimize operator error

Security measures will be specified in the tender requirements.

### **2.6.5 A list of the information publicly accessible through the user interface to the national registry**

Information to be made public on the registry user interface will be specified in the tender requirements.

### **2.6.6 An explanation of how to access information through the user interface of the national registry**

As the registry and other components of the Australian Emissions Trading Scheme are developed, information for registry users and other stakeholders will be posted at the following URL: <http://www.climatechange.gov.au/emissionstrading/>

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