



Environmental Protection Authority

Guidance for the Assessment of Environmental Factors

(in accordance with the
Environmental Protection
Act 1986)

Guidance Statement for Minimising Greenhouse Gas Emissions

No. 12

October 2002

Western Australia

FOREWORD

The Environmental Protection Authority (EPA) is an independent statutory authority and is the key provider of independent environmental advice to Government.

The EPA's objectives are to protect the environment and to prevent, control and abate pollution. The EPA aims to achieve some of this through the development of environmental protection Guidance Statements for the environmental impact assessment (EIA) of proposals.

This document is one in a series being issued by the EPA to assist proponents, consultants and the public generally to gain additional information about the EPA's thinking in relation to aspects of the EIA process. The series provides the basis for EPA's evaluation of, and advice on, development proposals subject to EIA. The Guidance Statements are one part of assisting proponents in achieving an environmentally acceptable proposal. Consistent with the notion of continuous environmental improvement and adaptive environmental management, the EPA expects proponents to implement best practice measures to protect the environment and to view the requirements of this Guidance as representing the minimum necessary process required to achieve an appropriate level of environmental protection.

This Guidance Statement specifically addresses the minimisation of greenhouse gas emissions from significant new or expanding operations. At the time of writing this Guidance Statement the State Government was developing a State Greenhouse Strategy which will set the wider policy context for greenhouse gas management. This Guidance Statement will be reviewed when new Government policy is announced.

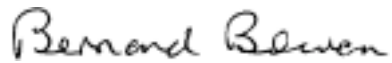
Carbon dioxide is the major greenhouse gas in Australia and climate change will have significant impacts here. South-west Australia will be worst affected in a number of ways. The enhanced greenhouse effect may result in increased fire frequency, temperature rises and changes in rainfall and carbon dioxide concentrations which could favour some plants at the expense of others, affecting agricultural production and species distributions. Changes in habitat distribution could particularly threaten native plant and animal species that are geographically isolated or occupy narrow ecological niches. Coastal areas could also be vulnerable, particularly to changes in intensity and frequency of storms and sea level rise. Clearly there is an important and urgent incentive for Western Australia to respond by encouraging timely and effective greenhouse gas management.

Current trends indicate that Australia would exceed its target under a "business as usual" scenario and will still do so with currently projected specific measures to reduce emissions. Accordingly, it is necessary for greenhouse gas minimisation to be kept firmly in mind when considering new development proposals which are likely to significantly add to emissions. Hence the EPA has produced this Guidance Statement to indicate the type of approach required when considering significant new or expanded proposals under its processes.

This Guidance Statement has the status of "**Final**" which means that a previous version has been reviewed by stakeholders and the public. The EPA has welcomed the inputs from an array of

sources, but any inaccuracies found or emphases given are entirely the responsibility of the EPA. The EPA will review this Guidance Statement, as appropriate, when new information is available.

I am pleased to release this document which now supersedes the draft version.

A handwritten signature in cursive script that reads "Bernard Bowen".

Bernard Bowen
CHAIRMAN
ENVIRONMENTAL PROTECTION AUTHORITY

October 2002

Table of Contents

	Page
1	PURPOSE.....1
2	THE ISSUE.....2
3	THE GUIDANCE.....8
3.1	Overview8
3.2	EPA's Objectives8
3.3	Guidance on greenhouse emissions
3.3 (a)	Greenhouse gas inventory and benchmarking.....9
3.3 (b)	Measures to minimise greenhouse gas emissions9
3.3 (c)	Carbon sequestration9
3.3 (d)	Minimising emissions over the life of the project10
3.3 (e)	Benefits on a national or global scale.....10
4	APPLICATION11
4.1	Area11
4.2	Duration and Review11
5	RESPONSIBILITIES.....11
5.1	Environmental Protection Authority Responsibilities.....11
5.2	Proponent Responsibilities11
6	GLOSSARY OF TERMS.....11
7	LIMITATIONS14
8	REFERENCES15
	APPENDIX 1 – Generic Flow Diagram for the Guidance Statement Process

Guidance Statement No. 12

Guidance Statement for Minimising Greenhouse Gas Emissions

Key Words: **greenhouse gas emissions, abatement measures, carbon sequestration**

1 PURPOSE

- 1.1** Guidance Statements generally are developed by the EPA to provide advice to proponents, and the public generally, about the minimum requirements for environmental management which the EPA would expect to be met when the Authority considers a proposal during the assessment process. The generic process is set out in Appendix 1.

This Guidance Statement is termed “Final”, in the context of Appendix 1 of this document, and thus the EPA expects that proponents will give full attention to the information provided when they submit proposals for assessment. Please note, however, the qualifying statement in Section 1.4 below.

- 1.2** This Guidance Statement specifically addresses the minimisation of greenhouse gas emissions from significant new or expanding operations. The Guidance provides information which the EPA will consider when assessing proposals where greenhouse gas emissions is a *relevant environmental factor* in an assessment. The EPA recognises, however, that greenhouse gas abatement is the responsibility of all sectors of the community.
- 1.3** This is a Guidance Statement and proponents are encouraged to consider their proposals in the light of the guidance given. A proponent wishing to deviate from the minimum level of performance set out in this Guidance Statement would be expected to put a well-researched and clear justification to the EPA arguing the need for that deviation. In practical terms this means that the proponent would need to show that the intent of the EPA Guidance has been understood and given serious consideration. An argument to deviate from the position in this Guidance Statement would need to demonstrate that all practicable endeavours have been made to meet the intent of the EPA’s Guidance, even though the approach may differ from that outlined in this document.
- 1.4** At the time of writing this Guidance Statement the State Government was developing a State Greenhouse Strategy which will set the wider policy context for greenhouse gas management. Since such a Government document will set new policy directions, this Guidance Statement should be regarded as an interim statement of the EPA’s views, which will be reviewed when new Government policy is announced.

2 THE ISSUE

The Greenhouse effect

The greenhouse effect is a natural phenomenon that warms the earth and enables it to support life. Without it, the average temperature on earth would be around minus 18°C, a frozen wilderness, instead of the current +15°C. It works on the same principle as the ordinary glass garden greenhouse. The atmosphere allows light energy to get in, then retains absorbed heat. This makes for a much higher temperature inside the greenhouse (Intergovernmental Committee on Ecologically Sustainable Development, 1997).

On a planetary scale, similar processes occur. Short wave radiation from the sun penetrates the atmosphere and reaches the earth's surface, warming it. The earth re-radiates much of this heat in the form of (invisible) infra red radiation. Infra red rays have a longer wavelength than incoming sunlight and for this reason can be absorbed by certain gases in the atmosphere, labelled greenhouse gases. This absorption of heat warms up the atmosphere, which in turn radiates some of the heat back to the earth. Human activities have enhanced the amount of greenhouse gases in the atmosphere. The Kyoto Protocol is an international agreement designed to foster action to manage the human enhanced greenhouse effect.

The six greenhouse gases specifically covered by the Kyoto Protocol are carbon dioxide (CO₂), methane (CH₄), perfluorocarbons (CF_x), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and nitrous oxide (N₂O) (Commonwealth of Australia, 1998). To give a common base for considering the impact of the various gases, they are usually expressed in terms of carbon dioxide equivalents, where the potential of each to lead to heating in the atmosphere is expressed as a multiple of the heating potential of carbon dioxide.

Other greenhouse gases exist which are not specifically covered by the Kyoto Protocol. These include water vapour (H₂O), chlorofluorocarbons (CFCs), ozone (O₃), oxides of nitrogen (NO_x), carbon monoxide (CO), non-methane volatile organic compounds (NMVOC) and sulphur dioxide (SO₂) for example (Intergovernmental Committee on Ecologically Sustainable Development, 1997).

The concentration of carbon dioxide in the atmosphere has increased by about 31% over the past 200 years. The concentration of methane has also increased by 151% over the same period (Intergovernmental Panel on Climate Change (IPCC), 2001). The main anthropogenic greenhouse gas is CO₂. Much of the attention to greenhouse gases thus falls on CO₂.

In its Third Assessment Report, released in 2001, the IPCC reported on the new results from the past five years of research on climate change. The IPCC reported that, (Intergovernmental Panel on Climate Change, 2001):

- an increasing body of observations gives a collective picture of a warming world and other changes in the climate system;
- the Earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era, with some of these changes attributable to human activities;

- carbon dioxide concentrations, globally averaged surface temperature, and sea level are projected to increase under all IPCC emissions scenarios during the 21st century;
- physical and biological systems have already been affected in many parts of the world by changes in climate, particularly increases in regional temperature; and
- projected climate change will have beneficial as well as adverse effects on both environmental and socio-economic systems, but the larger the changes and rate of change in climate, the more the adverse effects predominate.

The IPCC has reported that the global average surface temperature has increased by 0.6°C since 1861. Globally, it is likely that the 1990s was the warmest decade and 1998 the warmest year, in the instrumented record (1861-2000). The IPCC predicts that the global mean surface air temperature is likely to rise within a range of 1.4°C to 5.8°C over the period 1990 to 2100. Global mean sea level is projected to rise within the range 0.09 to 0.88 m between the years 1990 and 2100. This rise is due primarily to thermal expansion of the oceans and melting of glaciers and ice caps.

The impact of rising global mean surface air temperatures and sea levels on the environment range from modified ocean circulation and changed marine ecosystems, altered and modified ecosystems as a result of shifts in climatic zones induced by the enhanced greenhouse effect, altered levels of food production due to changes in weather and pest distributions (as associated with climate change), water scarcity through altered patterns of agricultural, ecosystem and other water uses and increased severity and frequency of natural hazards such as severe droughts and tropical cyclones (Intergovernmental Panel on Climate Change, 1990).

The findings by the IPCC have been supported in the Ministerial Declaration of the Sixth Conference of the Parties (Ministers to the United Nations Framework Convention on Climate Change, 2001) to the United Nations Framework Convention on Climate Change (UNFCCC) in June 2001 and give credence to the need for more effective action by all countries including Australia.

International Response

The United Nations Framework Convention on Climate Change provides the focus for international action to address the threat of climate change. The EPA notes and supports the objective of this treaty which is to achieve 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic (man-made) interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure the food production is not threatened and to enable economic development to proceed in a sustainable manner' (Intergovernmental Committee on Ecologically Sustainable Development, 1997).

In order to put the UNFCCC into operation, further rules were required. In December 1997, the signatories to the UNFCCC finalised the Kyoto Protocol for this purpose. The Kyoto Protocol (if and when it comes into force) would represent a significant first step in an effective international response to climate change. As signatories to the Protocol, developed countries collectively would be required to reduce their greenhouse gas emissions from 1990 levels by at least five percent by 2008-2012. Within this agreement, Australia negotiated

special concessions to limit its increase to no more than 8% above the 1990 levels over the same timeframe.

During 2001, further detailed rules for implementation of the Protocol were added in Marrakech. The United States, representing some 30% of global greenhouse gas emissions, withdrew from the Kyoto Protocol to pursue a 'parallel path' for emissions reductions. To come into effect, the protocol requires ratification by 55 countries responsible for 55% or more of the emissions.

Australia has not ratified the Kyoto Protocol at present. However the Australian government has signalled its intention for the nation to meet the 108% Kyoto target regardless of ratification.

National Inventories

National inventories for greenhouse gas emissions have been prepared by the National Greenhouse Gas Inventory Committee (NGGIC) for the period 1990 to 1999 and by the Australian Greenhouse Office subsequently.

Table 1: Greenhouse Gas Inventories

Jurisdiction	Net greenhouse gas emissions: 1990 MtCO ₂ e	Net greenhouse gas emissions: 1995 MtCO ₂ e	Net greenhouse gas emissions: 2000 MtCO ₂ e	Net greenhouse gas emissions: 2010 ³ projected MtCO ₂ e
W Australia	42.5 ¹	49.3 ¹	ne	ne
Australia	503.3 ²	ne	535.3	580 ^{2,4}

Sources: National Greenhouse Gas Inventory Committee (NGGIC), 1996, 1998, 1999a,b; Australian Greenhouse Office, 2002.

Notes:

- ¹ excluding land use change
 - ² including land use change
 - ³ projection with specific measures to reduce greenhouse gas emissions
 - ⁴ projection based on UNFCCC accounting, does not equate with a projection for comparison with the 108% Kyoto target. Projection based on Kyoto rules is 111% of the 1990 target.
- ne – no estimate

Australia, with 0.3% of the world's population contributed 1.4% of global greenhouse gases in 1995 (Government of Western Australia, 1997; Department of Foreign Affairs and Trade, 1997 and Government of Western Australia, 1998). Western Australia contributed around 11% of national emissions in 1990 and approximately 12% in 1995 (National Greenhouse Gas Inventory Committee, 1998).

Current trends indicate that Australia would exceed its target under a "business as usual" scenario and will still do so with currently projected specific measures to reduce emissions (Australian Greenhouse Office, 2002). Australia's Third National Communication on Climate Change to the United Nations Framework Convention on Climate Change (UNFCCC) indicates that Australian emissions are currently projected to be 111% of the Kyoto target if calculated using the Kyoto rules or 116% if the UNFCCC rules are

used¹ (Australian Greenhouse Office, 2002). Accordingly, it is necessary for greenhouse gas minimisation to be kept firmly in mind when considering new development proposals which are likely to significantly add to emissions. Hence the EPA has produced this Guidance Statement to indicate the type of approach required when considering significant new or expanded proposals under its processes.

National Greenhouse Strategy

The Framework Convention on Climate Change (FCCC) recognises that all Parties have a common but differentiated responsibility to address climate change. The Convention further recognises that each Party is unique and, therefore, its climate change response strategy must be tailored to suit its particular circumstances. In its Third National Communication to the UNFCCC (2002), Australia's own requirement is to limit our greenhouse gas emissions in the target period to no more than eight percent above the 1990 base year level (Commonwealth of Australia, 1998).

Australia's size, diverse environments and population growth concentrated along an extensive coastline exposes Australia to a wide range of potential impacts and costs arising from climate change, and its associated disruption of the environment and human activities (Third National Communication Report, 2002).

Australia is also vulnerable to the potential economic impacts of international and domestic actions to reduce greenhouse gas emissions. This vulnerability is due to factors such as Australia's significant role in the world trade of energy and mineral resources and processed products, reliance on long haul transport over a large land area, its widely dispersed natural resources and remoteness from overseas markets. Australia has few economically viable alternatives to sourcing most of its energy from fossil fuels, with no nuclear energy and limited hydro-electricity capacity. This large supply of fossil fuels has formed the basis for energy intensive export industries such as aluminium smelting, steel making and LNG production.

Australia is taking these national circumstances into account in formulating its response to climate change, recognising that effective climate change policies must accommodate adaptation, environmental protection, conservation, economic growth and social justice (Third National Communication Report, 2002).

Australia developed a National Greenhouse Strategy (NGS) published in 1998, which provides the strategic framework for advancing Australia's Greenhouse response. There are no State or project-specific requirements in the National Strategy, although the strategy does indicate responsibility for measures for the Commonwealth and State governments.

Implementation plans have been developed by States and Territories as subsidiary documents to the National Strategy.

These plans are to be guided by the same principles which have guided the NGS namely:

¹ The two projections use very different bases when estimating forestry sinks.

- the need to have a Greenhouse response which is tailored to Australia's national interests;
- the need to integrate Greenhouse considerations with other government commitments;
- the pursuit of Greenhouse action consistent with equity and cost effectiveness and with multiple benefits;
- recognition of the importance of partnerships between governments, industry and the community in delivering an effective Greenhouse response; and
- the need for action to be informed by research.

State Greenhouse Strategy

According to Australia's Third National Communication to the United Nations Framework Convention on Climate Change, CO₂ makes the largest contribution to Australia's total emissions, amounting to 72% of all emissions in 2000 (Australian Greenhouse Office, 2002). Annual temperatures could be 0.4 to 2.0°C higher over most of Australia by 2030. Most climate models project an annual average rainfall decrease in south-west Australia and generally warmer conditions by 2030, which would lead to increased evaporation. When combined with the projected changes in rainfall, these changes would result in a decrease in available moisture and greater moisture stress. Natural and human systems that are particularly vulnerable to climate change include the semi-arid habitats in south-west and inland Australia. Water supply and hydrology systems are likely to become increasingly vulnerable to climate change due to projected drying trends. South-west Australia is likely to be most affected by increased temperatures and reduced rainfall (Australian Greenhouse Office, 2002).

The enhanced greenhouse effect may result in increased fire frequency, temperature rises and changes in rainfall and carbon dioxide concentrations which could favour some plants at the expense of others, affecting agricultural production and species distributions. Changes in habitat distribution could particularly threaten native plant and animal species that are geographically isolated or occupy narrow ecological niches. Coastal areas could also be vulnerable, particularly to changes in intensity and frequency of storms and sea level rise (Government of Western Australia, 1998).

In summary, CO₂ is the major greenhouse gas emitted in Australia and climate change will have significant impacts here. South-west Australia will be worst affected in a number of ways. Clearly there is an important and urgent incentive for Western Australia to respond by encouraging timely and effective greenhouse gas management.

The Western Australian government is currently developing a comprehensive greenhouse strategy which is based on four strategic directions as listed below.

- Adaptation strategies to reduce vulnerability of human activities and natural systems to changes in climate and weather.
- Emissions reduction strategies to protect Western Australia's quality of life and economic development while reducing greenhouse gas emissions through better energy efficiency, industry re-engineering and restructuring, renewable energy sources, and improved land management and other practices.

- Carbon sink promotion, by revegetation and other processes that promote the absorption and storage of carbon dioxide from the atmosphere, to increase the amount of carbon stored in the Western Australian landscape.
- New industry development to increase the contribution to the Western Australian economy of 'greenhouse friendly' goods and services that take maximum advantage of new opportunities in response to climate change.

Flexibility Mechanisms

The Kyoto Protocol established three mechanisms to provide parties to the Convention with flexibility to meet emissions targets:

- Clean Development Mechanism (CDM). This provided for developed countries to access emissions credits derived from projects in developing countries;
- International Emissions Trading (IET). This applies only to Annex B countries (primarily developed countries as listed in Annex B to the Protocol). These countries can use assigned amounts listed in Annex B or sell unused amounts to other Annex B countries. The buying and selling of emissions credits can be through direct negotiation or indirectly through brokers or exchanges; and
- Joint Implementation (JI). This mechanism functions like CDM but is confined to Annex 1 countries (countries listed in Annex 1 of the FCCC and are those which have adopted the commitments under the FCCC to limit greenhouse gas emissions. It basically comprises OECD countries, Russia, Eastern European countries and Turkey).

While the Kyoto Protocol offers one mechanism for trading carbon emissions, the pertinent environmental outcome is that a bona fide carbon reduction occurs. If other carbon trading instruments are proposed, they would be considered by the EPA provided they can be monitored and verified to accepted Australian or international standards.

3 THE GUIDANCE

3.1 Overview

Whilst there is a range of views within the scientific community over the climatic and environmental effects that can be expected as a result of increasing levels of greenhouse gases, the majority view held in the scientific community is that global warming is occurring and will continue unless abatement measures commence promptly.

The Enhanced Greenhouse Effect has been given a 4 star rating in the 1998 Western Australian State of the Environment Report which indicates the issue has a high priority for government and community action.

This Guidance Statement applies to all new proposed projects and extensions to projects subject to environmental impact assessment by the EPA where greenhouse gas emissions is considered to be a *relevant environmental factor*.

3.2 EPA's Objectives

The EPA's environmental objective for greenhouse gas management is to reduce emissions to a level which is as low as is practicable. To achieve this the EPA's environmental assessment objective is to ensure that potential greenhouse gas emissions emitted from proposed projects are adequately addressed in the planning/design and operation of projects and that:

- best practice is applied to maximise energy efficiency and minimise emissions;
- comprehensive analysis is undertaken to identify and implement appropriate offsets; and
- proponents undertake an ongoing program to monitor and report emissions and periodically assess opportunities to further reduce greenhouse gas emissions over time.

While it is recognised that the enhanced greenhouse effect is clearly a global issue, the EPA's jurisdiction is limited to Western Australia. In the context of Western Australia, offsets include activities that reduce the greenhouse gas output or intensity per unit product from current or future activities over the lifecycle of the asset or activity in ways which are clearly linked to Western Australia. Examples include but are not limited to actions within Western Australia such as;

- establishment and maintenance of perennial vegetation;
- sequestration of carbon by geological, chemical, biological or other means;
- reducing the carbon intensity of existing activities;
- replacing fossil fuels with renewable fuels;
- synergistic linking of enterprises to reduce net greenhouse gas outputs;
- approved trading mechanisms; and
- development of new greenhouse gas efficient technologies.

Other national and international offsets are of course valuable in addressing the global issue and the EPA encourages proponents to discuss these also.

3.3 Guidance on greenhouse gas emissions

Proponents should clearly indicate in their environmental review documentation the following:

(a) Greenhouse gas emissions inventory and benchmarking

Using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee² or other nationally agreed methodology, estimate the gross emissions of greenhouse gases that are likely to be emitted from the proposed project for each year of its operation in absolute and in carbon dioxide equivalent figures (see (b) below).

Detail the project lifecycle greenhouse gas emissions and the greenhouse gas efficiency of the proposed project (per unit of product and/or other agreed performance indicators). The parameters should be compared with similar technologies producing similar products or their analogues. As well, compare emissions in the context of improvement in industry practice since 1990.

Using the methodology developed and periodically updated by the National Greenhouse Gas Inventory Committee, estimate for the proposal for each year of its operation, in carbon dioxide equivalent figures, any gross removals of greenhouse gases due to carbon sequestration activities (see (c) below).

(b) Measures to minimise greenhouse gas emissions

Consider a wide range of options and then indicate the intended measures and efficient technologies to be adopted to minimise or reduce total greenhouse gas emissions in the proposed project. This should include:

- (i) identifying improvements in energy efficiency, conservation measures and the reduction of fugitive emissions where applicable; and
- (ii) indicating where potential savings in greenhouse gas emissions can be made through the use of renewable energy sources. This should take into account fossil fuels used for supplementary power generation.

(c) Carbon Sequestration

Consider a wide range of carbon sequestration options and include intended measures for research and adoption. Options include:

- forestry or other revegetation;
- geological re-injection;
- chemical methods;

² The methodology developed by the National Greenhouse Gas Inventory Committee is detailed in the list of references provided in this Guidance Statement.

- soil uptake; and
- re-use.

(d) Minimising emissions over the life of the project

The design measures to minimise emissions, and the sequestration and sink enhancement actions to offset emissions, identified in points (b) and (c) above should represent best practice at the time of seeking project approval. Consistent with the principles of continuous improvement, the EPA expects that, as part of their environmental review, proponents should also commit to an ongoing programme of monitoring, investigation, review and reporting of internal and external greenhouse gas abatement measures. Periodic reviews through the life of the project should identify opportunities to further reduce greenhouse gas emissions over time.

This may include use of the Kyoto Protocol flexibility mechanisms (Emissions Trading, Joint Implementation, Clean Development Mechanism), other trading systems verifiable to relevant standards, carbon sequestration options and direct emissions reduction. Consistent with established EIA practice, such a commitment would then form part of the approval conditions for the proposal.

Proponents should also consider and advise whether they will join the Commonwealth Government's "Greenhouse Challenge" (Department of Primary Industry and Energy, undated) voluntary cooperative agreement program (whether on a project-specific basis, company-wide arrangement or within an industrial grouping, as appropriate).

(e) Benefits on a national or global scale

This section provides the opportunity for proponents to place the proposal in a national and global context so as to provide an understanding of where broader offset benefits might occur. It provides the opportunity for the proponent to provide an overarching statement in support of the proposal indicating where positive outcomes would be achieved in relation to greenhouse gas emissions, regardless of where these measures are located.

The EPA looks to proponents to provide the best possible outcome within Western Australia but also recognises the potential for benefits to accrue at the national and global scale. If a proponent has adopted best practice to reduce greenhouse gas emissions in Western Australia, the EPA then acknowledges that benefits may also accrue through actions taken by the proponent elsewhere in Australia or internationally.

4 APPLICATION

4.1 Area

This Guidance Statement applies to all applications for new proposed projects and extensions to projects formally assessed by the EPA throughout the State of Western Australia where greenhouse gas emissions is considered to be a relevant environmental factor.

4.2 Duration and Review

The duration of this Guidance Statement is for five years unless some circumstances require it to be revised earlier. At the time of writing this Guidance Statement the State Government was developing a State Greenhouse Strategy which will set the wider policy context for greenhouse gas management. Since such a Government document will set new policy directions, this Guidance Statement should be regarded as an interim statement of the EPA's views, which will be reviewed when new Government policy is announced.

5 RESPONSIBILITIES

5.1 Environmental Protection Authority Responsibilities

The EPA will apply this Guidance Statement during the assessment of proposals under Part IV of the *Environmental Protection Act, 1986* where greenhouse gas emissions is considered to be a relevant environmental factor.

5.2 Proponent Responsibilities

Where proponents demonstrate to the EPA that the requirements of this Guidance Statement are incorporated into proposals, in a manner which ensures that they are enforced and audited, the assessment of such proposals is likely to be assisted.

6 GLOSSARY OF TERMS

Abatement

Limiting, abating, avoiding or sequestering greenhouse gas emissions through source reduction, fuel displacement or switching, carbon stabilising techniques or sink enhancement (Department of Primary Industry and Energy, undated).

Absolute Emissions

Refers to the total emissions of greenhouse gases expressed in terms of the actual mass of each individual gas emitted over a specified time period (Department of Primary Industry and Energy, undated).

Business as usual

Continuing current practices with no additional action to reduce or mitigate greenhouse gas emissions.

Best practice

Best practice means the adoption of technology and environmental management procedures defined as best practice by the EPA from time to time. The EPA intends to develop a Guidance Statement outlining the operational aspects of the term "best practice" in the near future. That Guidance Statement will be made available as a draft for the full round of public comment in the usual way.

Carbon Dioxide Equivalent

This is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential factor. This will enable emissions of different gases to be added together and compared with carbon dioxide (Environmental Protection Authority, 1995).

Commonwealth Government's "Greenhouse Challenge" Voluntary Cooperative Agreement Program

The Greenhouse Challenge is a cooperative effort by industry and Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. Participation in the challenge will be through 'cooperative agreements' between the Commonwealth Government and industry participants.

The objective of these agreements is to capture the capacity of industry to abate its greenhouse emissions, mainly by improving its efficiency in energy use and processing. A successful program will mean that Australia is developing sustainable strategies that respond effectively to climate change, while maintaining or enhancing Australian industry competitiveness.

The following features form the basis for cooperative agreements between industry and the Commonwealth to abate greenhouse gas emissions and enhance sinks, as part of a comprehensive approach.

Cooperative agreements include the following (Department of Primary Industries and Environment, undated):

- an appropriate emissions inventory;
- specific greenhouse action plans;
- a commitment to regular monitoring and reporting of performance against action plans;
- provision for verification of performance; and
- a public statement, as agreed by the parties, on the undertakings contained in the agreement.

Greenhouse Gases

Proponents would be required to report on the emissions of:

- a) carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (CF_x) in terms of their absolute emissions and their “carbon-dioxide equivalent” (CO₂-e); and
- b) hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆) in terms of their absolute emissions.

The “carbon dioxide equivalent” is calculated by multiplying the actual mass of emissions by the appropriate Global Warming Potential (GWP) factor published by the Intergovernmental Panel on Climate Change (Environmental Protection Authority, 1995 and Intergovernmental Panel on Climate Change, 1995).

Gross Emissions

The actual mass of the greenhouse gases emitted. These emissions may be expressed as either absolute or “carbon dioxide equivalent” emissions.

Global Warming Potential

Global Warming Potential (GWP) is the warming potential of a gas. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. GWPs also vary with the time horizon being considered. The 100 year horizon is generally used in policy analyses. At the time of the publication of this document the published GWPs were 1 for carbon dioxide (CO₂), 21 for methane (CH₄), 310 for nitrous oxide (NO₂), 23,900 for sulphur hexafluoride (SF₆), 6,500 for the PFC perfluoromethane (CF₄) and 9,200 for the PFC perfluoroethane (C₂F₆). GWPs are not available for other greenhouse gases at this stage (Intergovernmental Panel on Climate Change 1996; National Greenhouse Gas Inventory Committee 1997; United Nations 1997 and Environmental Protection Authority 1995).

Project lifecycle greenhouse gas emissions

Project lifecycle greenhouse gas emissions are those measured cumulatively from the point of extraction of the raw materials to the beginning of the consumer phase of the product.

Measures

Refers to the range of possible actions that could be undertaken which directly or indirectly contribute to the abatement of greenhouse gas emissions through source reduction or sink enhancement (Department of Primary Industry and Energy, undated).

National Greenhouse Gas Inventory Committee (NGGIC)

The National Greenhouse Gas Inventory Committee consists of representatives of the Commonwealth, State and Territory Governments and oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia (Environment Australia, pers. comm.). Up-to-date methodology workbooks may be obtained by contacting Environment Australia.

Net Greenhouse Gas Emissions

The actual mass of the greenhouse gases emitted minus any emissions that may have been removed through sequestration or sink enhancement (Department of Primary Industry and Energy undated and National Greenhouse Gas Inventory Committee 1996a).

Sequestration

Sequestration is not yet precisely defined for the purposes of recognised trading or offset schemes. Accordingly, the EPA will need to take a common sense approach on a case by case basis in the interim. To assist proponents, the EPA regards sequestration as a process that results in the isolation of carbon dioxide from the atmosphere for a period which is significant in terms of influencing the global warming effect. Sequestration includes sink enhancement whereby structures are created or the use of existing structures is facilitated in ways which remove carbon dioxide from the atmosphere for a significant period.

7 LIMITATIONS

This Guidance Statement has been prepared by the Environmental Protection Authority to assist proponents and the public. While it represents the contemporary views of the Environmental Protection Authority, each proposal which comes before the Environmental Protection Authority for environmental impact assessment will be judged on its overall merits. Proponents wishing to deviate from the Guidance provided in this document should provide robust justification for the proposed departure.

8 REFERENCES

Commonwealth of Australia, 1998. National Greenhouse Strategy. Commonwealth of Australia. Canberra. Australia.

Department of Foreign Affairs and Trade, 1997. Australia and Climate Change Negotiations - Issues Paper September 1997.

Department of Primary Industry and Energy, undated. A Greenhouse Challenge for Australian Industry, Canberra.

Environmental Protection Authority, 1993. A Guide to Environmental Impact Assessment in Western Australia.

Environmental Protection Authority, 1995. New South Wales Greenhouse Gas Inventory Report. Estimates for 1990 and 2000.

Government of Western Australia, 1997. Environment Western Australia 1997 Draft State of the Environment Report for Western Australia.

Government of Western Australia, 1998. Environment Western Australia, 1998. State of the Environment Report for Western Australia.

Intergovernmental Panel on Climate Change, 1990. Climate Change: The IPCC Impacts Assessment. Report prepared for IPCC by Working Group II. Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change, 1995. The 1995 Report of the Scientific Assessment Working Group of IPCC: Summary for Policy makers. Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change, 1996. Climate Change 1995. The Science of Climate Change. Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change.

Intergovernmental Committee on Ecologically Sustainable Development, 1997. Fact Sheets; Overview and Global Warming.

Jenkins B, CEO, Department of Environmental Protection, Chairman, WA Greenhouse Council (undated). The Role of Western Australia in the National Greenhouse Strategy.

Ministers to the United Nations Framework Convention on Climate Change, 1996. Review of the Implementation of the Convention and of the First Session of the Conference of the Parties. Ministerial Declaration, in South Australian Greenhouse News 1996, edited by A Lothian, Department of Environment and Natural Resources, South Australia, p. 10-11.

National Greenhouse Gas Inventory Committee, 1996 National Greenhouse Gas Inventory 1988 to 1994. Summary and Analysis of Trends. Commonwealth of Australia.

National Greenhouse Gas Inventory Committee, 1996b. Australian State and Territory Greenhouse Gas Inventory 1988 and 1990. Western Australia.

National Greenhouse Gas Inventory Committee, 1997. Australian Methodology for the Estimation of Greenhouse Gas Emissions and Sinks, National Greenhouse Gas Inventory Committee, Canberra.

Workbook for Fuel Combustion Activities (Stationary Sources) National Greenhouse Gas Inventory Committee, Workbook 1.1 1996, Canberra

Workbook for Fugitive Fuel Emissions (Fuel Production, Transmission, Storage and Distribution) National Greenhouse Gas Inventory Committee, Workbook 2.1 1996, Canberra.

Workbook for Transport (Mobile Sources) National Greenhouse Gas Inventory Committee, Workbook 3.1 1996, Canberra.

Workbook for Carbon Dioxide from the Biosphere, National Greenhouse Gas Inventory Committee, Workbook 4.2 1997, Canberra.

Workbook for Non-Carbon Dioxide Gases from the Biosphere National Greenhouse Gas Inventory Committee, Workbook 5.1 1996, Canberra.

Workbook for Livestock National Greenhouse Gas Inventory Committee, Workbook 6.1 1996, Canberra.

Workbook for Industrial Processes and Solvent and Other Product Use National Greenhouse Gas Inventory Committee, Workbook 7.1 1996, Canberra.

Workbook for Waste National Greenhouse Gas Inventory Committee, Workbook 8.1 1996, Canberra.

Supplementary methodology for Sulphur Dioxide

National Greenhouse Gas Inventory Committee, 1998. State and Territory Greenhouse Gas Inventory 1990 and 1995: Western Australia. Commonwealth of Australia.

National Greenhouse Gas Inventory Committee, 1999a. Overview: 1999 National Greenhouse Gas Inventory.

National Greenhouse Gas Inventory Committee, 1999b. National Greenhouse Gas Inventory Analysis of Trends 1990 to 1998 and National Greenhouse Response Strategy Indicators 1990 to 1996. Commonwealth of Australia.

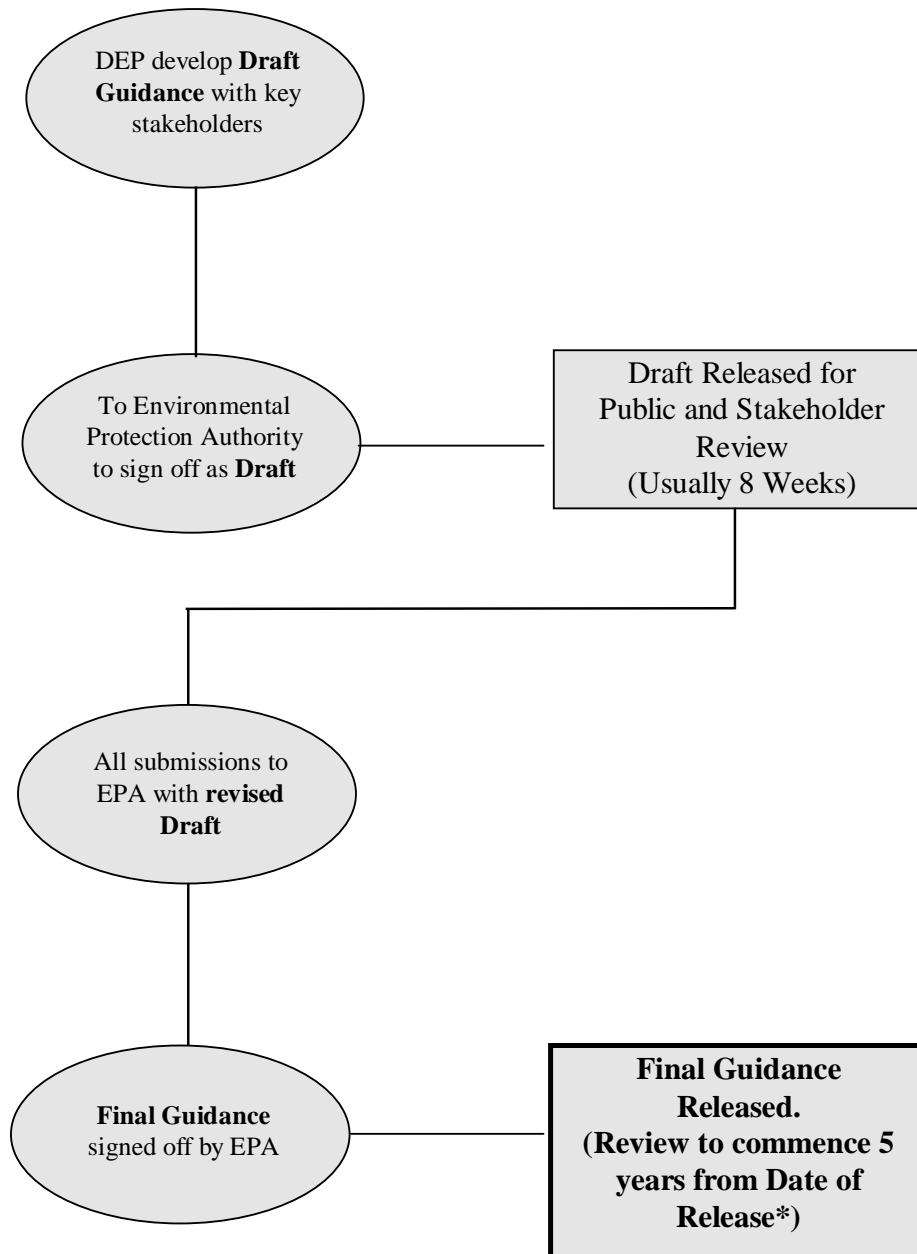
United Nations, 1997. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, Japan.

Watson, R.T. 2000. Presentation at the Sixth Conference of Parties to the United Nations Framework Convention on Climate Change, November 13 2000.

Index	Final Guidance	October 2002
Status	Signed-off by the EPA.	
Citation	This document can be cited as the Guidance Statement for Minimising Greenhouse Gas Emissions.	
Contact officer	Warren Tacey warren.tacey@environ.wa.gov.au	

Appendix 1

Generic Flow Diagram for the Guidance Statement Process



* Guidance may be reviewed earlier if circumstances require it.