



National Greenhouse and Energy Reporting Streamlining Protocol

Developed by the Council of Australian Governments Experts Group on Streamlining Greenhouse and Energy Reporting

Published by the Department of Climate Change on behalf of the Council of Australian Governments (COAG) Expert Group on Streamlining Greenhouse and Energy Reporting.

The COAG Experts Group on Streamlining Greenhouse and Energy Reporting is chaired by the Commonwealth and comprises representatives from each state and territory. The Group was established under the Complementary Measures Subgroup which reports to the COAG Working Group on Climate Change and Water.

ISBN: 978-1-921298-61-5

© Commonwealth of Australia 2009

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from:

The Director
Communications and Stakeholder Relations
Department of Climate Change
GPO Box 854
Canberra ACT 2601

Questions or comments about the content of this document should be addressed to:

The Assistant Secretary
Renewable and Reporting Branch
Department of Climate Change
GPO Box 854
Canberra ACT 2601

IMPORTANT NOTICE:

While reasonable efforts have been made to ensure that the contents of this publication are factually correct, the Commonwealth does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication.



Contents

Acronyms	vi
INTRODUCTION	1
1 The National Greenhouse and Energy Reporting Streamlining Protocol	3
1.1 How to use the Protocol	4
2 Background	6
2.1 The National Greenhouse and Energy Reporting System	6
2.2 Provision of NGER Act data to other agencies	8
2.3 The online reporting tool	9
STRUCTURING GREENHOUSE AND ENERGY PROGRAMS	11
3 Minimising reporting burden and compliance costs	12
3.1 Regulatory impact statements	12
4 Relating program objectives to reporting requirements	14
4.1 Industry sectors	15
4.2 Greenhouse gas emissions and energy sources	16
4.3 Thresholds	18
4.4 Reporting boundaries	18
4.4.1 Geographical boundaries	18
4.4.2 Organisational boundaries	19
4.4.3 Facility boundaries	19
4.4.4 Emissions boundaries	19
4.5 Standard approaches to greenhouse and energy reporting	20

STANDARD APPROACHES TO GREENHOUSE AND ENERGY REPORTING	23
5 Greenhouse and energy accounting and reporting principles	25
5.1 Relevance	26
5.2 Completeness	26
5.3 Consistency	26
5.4 Transparency	27
5.5 Accuracy	27
6 Reporting boundaries and entity definitions	28
6.1 Defining corporate level reporting obligations	29
6.1.1 Controlling corporation	29
6.1.2 Corporate groups	29
6.2 Defining business units	29
6.3 Defining a facility	30
6.3.1 Declaration of a facility by a regulatory authority	30
6.3.2 Facility specific reporting obligations	30
6.4 Sub facility reporting	33
6.5 Activity data	34
6.6 Determining operational control	34
6.6.1 Contractors and subcontractors	35
6.6.2 Declaration of operational control by a regulatory authority	35
7 Energy consumption and production	36
7.1 Energy production	36
7.1.1 Estimating energy production	36
7.2 Energy consumption	37
7.2.1 Estimating energy consumption	37
7.3 Incidental energy consumption and production	38
8 Greenhouse gas emissions	40
8.1 Greenhouse gas coverage	40
8.2 Greenhouse gas emissions	41
8.3 Estimating greenhouse gas emissions	43
8.3.1 Methods	43
8.4 Estimating incidental greenhouse gas emissions	44
9 Intensity indicators	45
9.1 Defining intensity indicators	46
9.2 Standard approach to intensity indicators	47
9.3 Calculating intensity indicators	47
9.4 Standard approach to greenhouse gas emissions and energy data	48

9.5	Standard approach to business metrics	48
9.5.1	Generic business metrics	49
9.5.2	Sector specific business metrics	50
10	Energy audits and assessments	51
10.1	Definition of energy audit or assessment	51
10.2	Standard approach: principle of reciprocal recognition	53
10.2.1	Existing programs	53
10.2.2	Future programs	55
10.3	Reporting energy audits and assessments	57
10.3.1	Core reporting fields	57
11	Energy savings and greenhouse gas reductions	58
11.1	Definition of energy savings	58
11.2	Calculating energy savings	58
11.2.1	EEO Energy Savings Measurement Guide (ESMG)	59
11.2.2	Industry specific guidance	59
11.3	Reporting achieved energy savings	59
11.4	Definition of greenhouse gas reductions	60
11.5	Calculating greenhouse gas reductions	60
11.5.1	The GHG Protocol	60
11.5.2	Greenhouse gas project regulations	60
11.5.3	NGER (Measurement) Determination	60
11.5.4	NGER sources	61
11.6	Reporting fields for greenhouse gas reductions	61
11.6.1	Greenhouse Gas Reductions	61
12	Action plans	62
12.1	Definition of action plan	62
12.2	Online reporting tool (OSCAR)	63
12.3	Reporting fields for greenhouse and energy action plans	63
13	Energy and greenhouse gas emissions projections	68
13.1	Definition of projections	68
13.2	Use of energy and greenhouse gas emissions projections	68
13.3	Standard approach	69
	Glossary	70
	Appendix A	74
	Appendix B	75
	Appendix C	77
	Appendix D	80
	Appendix E	88



Acronyms

ABN	Australian Business Number
ANZSIC	Australian and New Zealand Standard Industrial Classification
AUD	Australian Dollars
CH ₄	Methane
CO ₂ -e	Carbon dioxide equivalence
COAG	Council of Australian Governments
EEO	Energy Efficiency Opportunities
EREP	Environment and Resource Efficiency Plans
ESAP	Energy Savings Action Plans
GHG	Greenhouse gas emissions
GJ	Gigajoule
GWP	Global Warming Potential
HFCs	hydrofluorocarbons
IPCC	Inter-governmental Panel on Climate Change
ISO	International Organisation for Standardisation
kt	kilotonne
N ₂ O	Nitrous oxide
OSCAR	Online System for Comprehensive Activity Reporting
PFCs	Perfluorocarbons
NGER	National Greenhouse and Energy Reporting
SESP	Smart Energy Savings Program
SF ₆	Sulfur hexafluoride
TJ	terajoule
WRI	World Resources Institute
WBCSD	World Business Council for Sustainable Development



INTRODUCTION

Australian, state and territory governments are committed to reducing the costs of regulation and enhancing productivity in areas of shared responsibility. In light of this commitment, governments have agreed that red tape on business, created by multiple greenhouse and energy programs and initiatives, should be minimised.


Reporting is a central component of most greenhouse and energy programs as it allows entities and governments to monitor the achievement of their greenhouse and energy objectives. In response to growing awareness of the potential impacts of greenhouse gas emissions on our climate, governments have increasingly sought to engage industry in initiatives to promote greenhouse gas reductions, low emission technologies, and energy efficiency. Business is also responding to climate change, opting to participate in a variety of voluntary domestic and international greenhouse and energy initiatives.

The proliferation and diversity of initiatives requiring greenhouse gas emissions and energy information has, however, imposed a significant administrative burden on business. The result has been gaps in consistency, comprehensiveness and availability of reported data with implications for companies, markets, the public and governments. As a result, a number of issues regarding the useability and consistency of data have arisen:

- > Programs have developed unique reporting obligations to meet specific objectives, significantly increasing the complexity of reporting and costs for business.
- > Programs have published specific guidance explaining similar concepts using different terminology. Consequently, business has been required to re-interpret the terms and obligations for each program.

- > Information Technology (IT) systems have developed independently to meet the data collection needs of specific initiatives, requiring corporations to familiarise themselves with different IT systems and protocols.
- > Confidentiality protocols to protect corporate data have prevented the sharing of information between programs and governments.

To address these issues, the Council of Australian Governments (COAG) agreed in February 2009 to develop the *National Greenhouse and Energy Reporting Streamlining Protocol* (the Protocol) to ensure a standard approach to collecting greenhouse and energy information is implemented nationally.

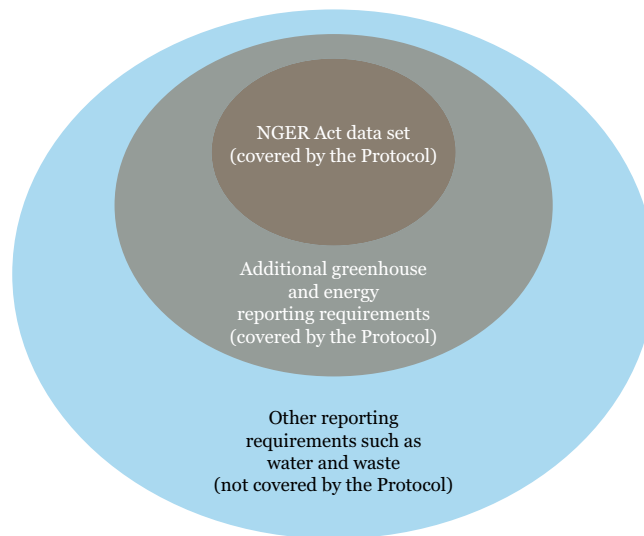


1 The National Greenhouse and Energy Reporting Streamlining Protocol

The Protocol is designed to provide guidance to program managers and policy makers on national approaches to greenhouse and energy accounting and reporting. It primarily provides guidance for government officials setting up or modifying greenhouse and/or energy programs on collecting data from reporting entities in a streamlined way and outlines how existing requirements of greenhouse and energy reporting programs fit together. The Protocol can also be used by industry to assist in understanding national approaches, but has not been designed to provide program specific guidance. Program guidance will be provided by program managers and program materials.

The Protocol details standard approaches to reporting greenhouse and energy information, including data collected under the *National Greenhouse and Energy Reporting Act 2007*, for use in current or future initiatives, programs or surveys. Further information on the NGER Act is outlined in section 2.1. Standard approaches to non greenhouse and energy data collected by some programs (e.g. water and waste data) are not covered by the Protocol (refer Figure 1.1).

Figure 1.1: Coverage of the NGER Streamlining Protocol



1.1 How to use the Protocol

The Protocol provides guidance to assist policy makers, program designers or managers in establishing reporting requirements for greenhouse and energy programs. Guidance is provided for each of the key areas as outlined below:

> **Structuring greenhouse and energy programs**

This section covers common program objectives and how they influence program design decisions and subsequently data required from participating entities. It is designed to assist decision making early in the development of a program to ensure the data collected will meet objectives of the program (including program evaluation requirements) whilst keeping compliance costs low.

> **Standard approaches to greenhouse and energy reporting**

This section covers standard approaches to collecting greenhouse and energy information including: principles that underpin greenhouse gas emissions and energy accounting; reporting boundaries and entities; and standard approaches to reporting elements commonly used in greenhouse and energy programs. Standard approaches are outlined for the following elements:

- Energy consumption and production
- Greenhouse gas emissions
- Energy audits
- Energy and greenhouse gas emissions action plans
- Energy savings
- Greenhouse gas reductions
- Energy and greenhouse gas emissions intensity indicators
- Energy and greenhouse gas emissions projections

Reporting elements (outlined above) can be collected on a mandatory or voluntary basis depending on the objectives of the program.

Governments have agreed that new programs and initiatives will use standard approaches to greenhouse and energy reporting and that a single online reporting tool will be offered to entities to assist in streamlining reporting. Further information on the online reporting system is outlined in section 2.3.

Any additional greenhouse or energy reporting requirements not covered by the Protocol will be reviewed and agreed through an inter-jurisdictional group under COAG (chaired by the Department of Climate Change) according to agreed principles and processes.

Any agreed additional reporting requirements should be available through the online reporting tool if possible.

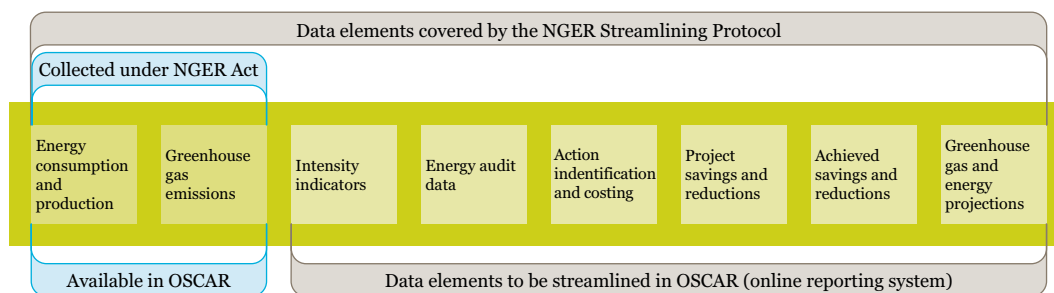
2 Background

Implementation of the Protocol was agreed through COAG as part of the ongoing agenda to streamline reporting of greenhouse and energy data. COAG agreed in 2007 that this would be facilitated through a national reporting point, the National Greenhouse and Energy Reporting System (NGER System).

2.1 The National Greenhouse and Energy Reporting System

The NGER System establishes a national framework for greenhouse and energy reporting by industry to meet the current and prospective reporting needs of government, business and the public. The NGER System encompasses the NGER Act, as well as mandatory and voluntary data collected under existing and future Australian, state and territory government programs and policies. The NGER System establishes a national standard approach to greenhouse and energy reporting and an online reporting tool to function as an entry point for reporting by business (refer Figure 2.1).

Figure 2.1: The National Greenhouse and Energy Reporting (NGER) System



The *National Greenhouse and Energy Reporting Act 2007* (the NGER Act), which underpins the NGER System, was passed in September 2007.

The NGER Act was established to reduce the reporting burden on industry by streamlining the greenhouse and energy reporting requirements of Australian, state and territory governments. All governments have committed to working together to achieve this objective.

The objective of the NGER Act is to introduce a single national reporting framework for the reporting and dissemination of information related to greenhouse gas emissions, greenhouse gas projects, energy consumption and energy production of corporations to:

- a. Underpin the introduction of the Carbon Pollution Reduction Scheme;
- b. Inform government policy formulation and the Australian public;
- c. Meet Australia's international reporting obligations;
- d. Assist state and territory government programs and activities; and
- e. Avoid duplication of similar reporting requirements in the states and territories.

The NGER Act mandates that corporations with greenhouse gas emissions or energy consumption or production above specified thresholds, must report greenhouse gas emissions and energy consumption and production data to the Australian Government. The NGER legislative framework comprises the:

- > *National Greenhouse and Energy Reporting Act 2007*
- > *National Greenhouse and Energy Reporting Regulations 2008*
- > *National Greenhouse and Energy Reporting (Measurement) Determination 2008*; and
- > National Greenhouse and Energy Reporting (Audit) Determination - under development

Figure 2.2 illustrates how the legislative framework fits together.

Figure 2.2: The NGER legislative framework



2.2 Provision of NGER Act data to other agencies

Data collected under the NGER Act will be available to Australian, state and territory government officials for program and policy purposes. For this data to be useful in other programs, programs need to ensure reporting requirements are consistent with the NGER Act. This may include aligning responsibility for reporting on energy consumption, energy production and greenhouse gas emissions, reporting boundaries, reporting periods and deadlines and methodologies for calculating energy consumption, energy production and greenhouse gas emissions.

The NGER Act (s26) allows the Regulator to disclose greenhouse and energy information to specified Commonwealth Minister/s, Secretaries and employees if they are responsible for administering a program or collecting statistics relating to greenhouse gas emissions, energy consumption or production.

Under the NGER Act (s27) the Regulator must disclose greenhouse and energy information to a state or territory if it is information:

- > that a state or territory has requested the Regulator to collect; or
- > relating to facilities that are wholly or partly located in the state or territory.

The Regulator may refuse to disclose information to specified Commonwealth persons or a state or territory if they are not satisfied that there would be adequate security measures to protect the confidentiality of the information.

In addition to security of information, the Regulator may also make disclosure of information subject to:

- > restrictions on disclosure of the information to other persons; and
- > ensuring that the state or territory is not requiring duplicative reporting of other information of a kind similar to greenhouse and energy information.

2.3 The online reporting tool

COAG has agreed that an online reporting tool will underpin streamlined reporting for Australian Government, state and territory government programs.

The Australian Government has developed an online reporting tool, the Online System for Comprehensive Activity Reporting (OSCAR), which will be used for reporting under the NGER Act.

OSCAR is a web-based data collection tool developed and managed by the Australian Government to record energy and greenhouse data for a number of government reporting programs. OSCAR stores conversion factors derived from the *National Greenhouse Energy Reporting (Measurement) Determination 2008* (the NGER (Measurement) Determination) to automatically convert energy and fuel consumption data into greenhouse gas emissions.

OSCAR can be configured so that program participants can report standard data through a single entry point and program managers can access relevant data. OSCAR can also be configured to cover any future additional data requirements agreed to be covered by this Protocol.

Further information on OSCAR is available at www.oscar.gov.au.



STRUCTURING GREENHOUSE AND ENERGY PROGRAMS

While the Protocol's principal purpose is to provide advice on standard approaches to greenhouse and energy reporting, the structure of a program can have implications on the effectiveness of streamlined reporting and influence the overall reporting burden and compliance costs.

This section covers common program objectives and how they influence program design decisions and subsequently the data required from participating entities. This section is designed to assist decision making early in the development of a program to ensure the data collected will meet objectives of the program (including program evaluation requirements).



3 Minimising reporting burden and compliance costs

The Council of Australian Governments has agreed that governments will establish and maintain gate keeping mechanisms as part of the decision-making process to:

- > maximise the efficiency of new and amended regulation;
- > avoid unnecessary compliance costs and restrictions on competition;
- > ensure that the regulatory impact of proposed regulatory instruments are fully transparent to decision makers in advance of decisions being made; and
- > ensure that the regulatory impact is made transparent to the public as soon as possible.

These gateways are normally in the form of a Regulatory Impact Statement or equivalent.

3.1 Regulatory impact statements

A Regulatory Impact Statement (RIS) or equivalent (depending on the terminology used in the jurisdiction) is generally required prior to implementing a new program. Regulatory Impact Statements aim to fully examine the costs and benefits of new programs and can be used to ensure that new programs do not place an unnecessary burden on participants.

The RIS often includes the following:

- > A statement of the objectives sought to be achieved by the regulation;
- > Identification of alternative options by which the objectives can be achieved;
- > Assessment of the costs and benefits of the proposed regulation;
- > Assessment of the costs and benefits of the alternatives; and
- > Assessment as to which of the alternative options involves the greatest benefit or the least net cost to scheme participants.


Program managers of future programs should use the RIS process (or equivalent) to consider the option that represents the lowest cost (monetary and otherwise) to scheme participants whilst still achieving the program aims. Consideration of reporting burden is important in the RIS as reporting requirements can be a large part of compliance costs for entities participating in greenhouse and energy programs. Nationally consistent reporting requirements will lower compliance costs for program participants.

The Australian Government Office of Best Practice Regulation (OBPR) provides advice and assistance on regulation impact assessment, the preparation of RISs for Ministerial Councils (which comprise Australian, state and territory Ministers), and monitors and reports on compliance with RIS requirements. Contact details for the OBPR are available at <http://www.obpr.gov.au>. Process requirements for the preparation of RIS's are outlined in *Best Practice Regulation, A Guide for Ministerial Councils and National Standard Setting Bodies, October 2007*.

Relevant bodies and guidelines for States and territory¹ policy and program development are:

- > NSW – Better Regulation Office, www.betterregulation.nsw.gov.au. The Better Regulation Office reviews all regulatory proposals for compliance with gatekeeping requirements, monitors and reports on compliance and provides ongoing advice and practical tools to agencies to assist in meeting the requirements.
- > QLD – Queensland Office for Regulatory Efficiency.
- > VIC – Victorian Competition and Efficiency Commission. Further information including guidelines for developing regulatory proposals is available at www.vcec.vic.gov.au.
- > SA – Cabinet Office, Department of the Premier and Cabinet.

¹ Western Australia, Tasmania, Northern Territory and the Australian Capital Territory do not have gateway keeping processes in place.



4 Relating program objectives to reporting requirements

The standard approach to reporting requirements has been designed to meet the data needs of programs with diverse objectives. Program designers should ensure the reporting burden on entities is minimised and only data elements required to underpin the objectives of the program are selected. Following is a list of common greenhouse and energy program objectives:

- > Reduce greenhouse gas emissions
- > Increase the adoption of energy efficient technologies and practices
- > Drive organisational behaviour change towards positive energy management practices
- > Reduce energy demand and increase energy security
- > Improve business competitiveness by reducing energy costs
- > Provide information to the public and government on the greenhouse or energy performance of entities.

Voluntary greenhouse programs tend to cover a wider spread of sectors, sources, and gases than regulatory programs. Regulatory programs tend to be more specific and selective in defining these elements as higher levels of data integrity and accuracy can easily increase the reporting costs for individual entities. The following section outlines key decision points in program design that will influence the data collected from program participants. Examples of how program objectives can influence these decisions are also provided.

During the program development phase, program designers should also consider which performance indicators will be developed in order to determine and track whether the program is meeting its objectives. Data collected over the life of a program provides evidence to evaluate whether the program is meeting the stated objectives.

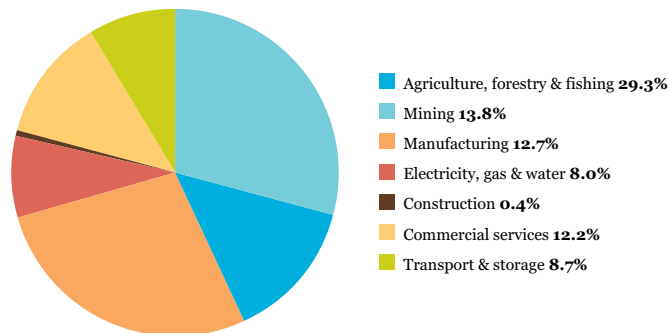
4.1 Industry sectors

Which industry sectors should be covered by the program to achieve the objectives?

A list of standard industry sectors is at Appendix D.

The selection of industry sectors for inclusion in the program will be influenced by the objectives. In many cases programs target specific industry sectors to achieve the desired goals. A standard list of industry sectors is available in the NGER legislation (see Appendix D) and is based on industry classifications in the *Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006*. Figure 4.1 illustrates the breakdown of emissions attributable to Australian industry sectors.

Figure 4.1: Emissions attributable to Australian industry by industry sector, 2006



Sources: DCC (2008b); ABS (2007)

Energy programs often focus on the largest energy consuming industry sectors. Energy consumption information will be collected from all industry sectors covered under the NGER Act.

4.2 Greenhouse gas emissions and energy sources

Which sources of greenhouse gas emissions and energy consumption or production should be covered by the program to achieve the objectives?

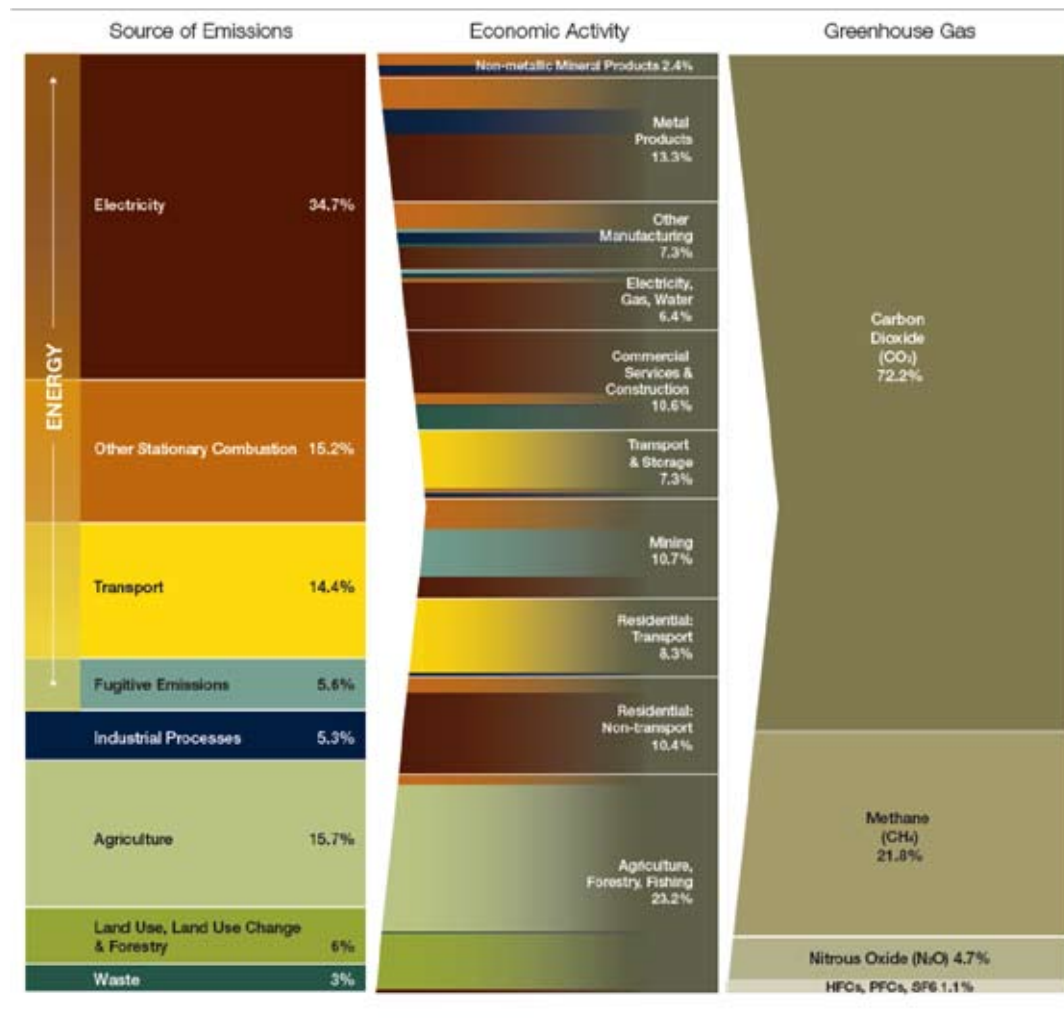
Refer to Appendix B for examples of possible greenhouse gas emissions sources from different types of activities.

Each industry sector includes a range of greenhouse gas emitting and energy consuming and producing activities and sources (refer Figure 4.2).

The standard approach to coverage of sources of greenhouse gas emissions is set out in the NGER (Measurement) Determination. The sources covered are stationary energy, transport, waste, fugitive emissions, and industrial processes (including synthetic gas consumption). Greenhouse gas emissions from land use, land use change and forestry and agriculture are generally not covered in greenhouse reporting programs at present. This is due to the lack of robust facility level calculation methodologies available.

The NGER (Measurement) Determination sources are based on the Intergovernmental Panel on Climate Change (IPCC) categories. Program designers should choose greenhouse gas sources relevant to the objectives of the program. Energy programs generally cover a wide spectrum of energy or fuel types. Program designers should align energy types with those covered in the NGER (Measurement) Determination. The NGER Regulations provides a comprehensive list of fuel and energy commodities which is included at Appendix C.

Figure 4.2: Australia’s greenhouse gas emissions and energy consumption by activity and source



Source: Australian Greenhouse Office, February 2007

4.3 Thresholds

Should thresholds for participation in the program be set?

Regulatory programs often set thresholds to ensure participation by only target entities. This can assist regulatory programs to ensure the reporting burden and compliance costs for non-target entities are kept to a minimum. Target entities will be determined by the objectives of the program. For example, if the objective of the program was to increase the energy efficiency of small business then it may be appropriate to set a threshold that excludes medium or large businesses.

Thresholds for participation in greenhouse or energy programs include metrics based on energy and greenhouse parameters, for example greenhouse gases emitted or energy used or metrics based on other business parameters, such as ANZSIC codes, staff numbers or annual turnover. Program designers should carefully consider the compliance costs associated with entities having to determine whether they are within a threshold range and are therefore required to participate. With emissions and energy thresholds, the entity would need to assess their overall inventory according to the program specifications such as boundaries and energy types. The relative costs and benefits for industry and government should be considered when determining program thresholds.

4.4 Reporting boundaries

What sort of boundaries should be set by the program to achieve the objectives?

Refer to section 6 *Reporting boundaries and entity definitions* for further information on standard boundary definitions.

When considering program objectives the following issues around reporting boundaries should be considered. Differences in reporting boundaries across programs can significantly increase compliance costs on reporting entities. Program designers should align reporting boundaries with the standard approaches outlined in section 6.

4.4.1 Geographical boundaries

The geographical boundaries will influence the reporting requirements within a program. In some cases, geographical boundaries for programs will be limited by jurisdictional powers and objectives. Most national programs require national-level or company level data and do not require further disaggregation. state and territory programs generally require data from entities that operate within the jurisdiction. The NGER legislation has been designed to incorporate multiple geographical boundaries to support Australian Government, state and territory policies and programs. For this reason the NGER legislation requires entities to provide data disaggregated by state or territory.

4.4.2 Organisational boundaries

Business operations differ in their legal and organisational structures. A standard approach to boundaries around company activities (organisational boundaries) has been established under the NGER Act and is based on the internationally accepted concept of operational control. This approach should be used by program managers.

Further information on organisational boundaries is covered in section 6.6.

4.4.3 Facility boundaries

Many programs require facility or 'site' level reporting. In achieving streamlining it is important that when designing a program, facility definitions are consistent with the NGER Act and can easily align with the corporate reporting structure.

Further information on standard approaches to facility boundaries is covered in section 6.3 and corporate structures are covered in section 6.1.

4.4.4 Emissions boundaries

To delineate direct and indirect emissions sources, improve transparency and provide for flexibility, three 'scopes' (scope 1, scope 2 and scope 3) have been defined for greenhouse gas accounting and reporting purposes in the *Greenhouse Gas Protocol: a corporate accounting and reporting standard* (the GHG Protocol) published by the World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD). Scopes 1 and 2 are also defined in the NGER legislation.

Scope 1

Scope 1 (also referred to as direct) emissions are greenhouse gas emissions which occur as a direct result of activities at a facility, for example, emissions from combustion in facility boilers, furnaces, flares or vehicles. Direct emissions are emissions over which entities have a high level of control. This is why emissions trading schemes and energy efficiency programs often target scope 1 emissions.

See section 8.2 for the standard NGER Act scope 1 definition for use in new programs.

Scope 2

Scope 2 (also referred to as energy indirect) emissions cover greenhouse gas emissions from the generation of purchased electricity, steam, heating or cooling consumed by a facility. 'Purchased' under the GHG Protocol definition means brought into the organisational boundary of the entity. Scope 2 emissions are indirect emissions that entities can easily measure and significantly influence through energy efficiency measures. This is why greenhouse gas emission reduction and energy efficiency programs often target scope 2 emissions.

See section 8.2 for the standard NGER Act scope 2 definition for use in new programs.

Scope 3

Scope 3 covers all indirect emissions that are not included in scope 2. Scope 3 emissions are a consequence of the activities of the facility/entity, but occur at sources or facilities not owned or controlled by the entity. For example, greenhouse gas emissions associated with the entity's product or service across all relevant stages (production, delivery, use and disposal) of the life cycle.

Scope 3 emissions are generally covered by voluntary programs aimed at assessing or reducing the life cycle emissions of an entity's products or services.

For this reason, the NGER legislation does not cover reporting of scope 3 emissions and program designers should carefully consider the rigor and burden of calculation methodologies before placing scope 3 reporting requirements on entities. Scope 3 reporting needs to be carefully considered in terms of reliability of any savings reported.

4.5 Standard approaches to greenhouse and energy reporting

Which greenhouse and/or energy elements should be collected by the program from participating entities to achieve the objectives?

Refer to chapters 7 *Energy consumption and production*, 8 *Greenhouse gas emissions*, 9 *Intensity indicators*, 10 *Energy audits and assessments*, 11 *Energy savings and greenhouse gas reductions*, 12 *Action plans*, and 13 *Energy and greenhouse gas emissions projections* for further information on standard approaches to reporting requirements.

Program designers should ensure the reporting burden on entities is minimised and only use data elements and fields that will contribute to the objectives of the program. Standard approaches are further outlined in chapters 7 to 13 of this Protocol.

Additional data requirements will be reviewed through an inter-jurisdictional group under COAG to ensure the standard data set doesn't expand unnecessarily.

Historical greenhouse gas emissions or energy consumption are generally collected by programs to help entities and program managers understand a given entity's energy use or production of greenhouse gas emissions.

Intensity indicators are useful to track greenhouse gas emissions or energy performance over time as indicators are independent of company structural changes and activity levels.² Intensity indicators are also commonly referred to as efficiency indicators and business activity indicators.

Most programs aiming to reduce energy consumption and increase the uptake of energy efficient technologies require energy audits or assessments. An audit looks at the energy consumed within a system and can be used to identify actions to reduce energy consumption and greenhouse gas emissions. The actions are often detailed in an action plan outlining projected and achieved greenhouse gas reductions and energy savings.

Box 4.1 sets out an example of how program objectives influence the elements of the standard data set required to underpin the program.

Box 4.1: Encouraging corporate energy efficiency

A number of programs currently encourage, or in many cases, require entities to put in place actions to improve their energy efficiency.

Program designers aiming to encourage participants to identify, evaluate, and in some cases implement cost effective energy savings opportunities may require reporting of the following data elements by entities:

- > Energy consumption
- > Energy intensity
- > Energy audits or assessments
- > Energy action plan
- > Energy savings

² A reduction in energy intensity does not necessarily translate directly to energy efficiency. However, as energy and greenhouse gas intensities are comparatively simple calculations for which data is usually available, they are often used as a proxy for energy efficiency indicators. This practice can be misleading as factors other than efficiency can influence the business metric / energy consumption ratio, particularly when generating aggregate indicators. Greenhouse gas intensity is further removed from energy efficiency, as it considers emissions sources other than energy consumption.



STANDARD APPROACHES TO GREENHOUSE AND ENERGY REPORTING

As outlined in the introductory section of this Protocol, this section covers standard approaches to collecting greenhouse and energy information.

Chapter 5 covers the principles that underpin greenhouse and energy accounting. These are based on those published by the GHG Protocol.

Chapters 6 *Reporting boundaries and entity definitions*, 7 *Energy consumption and production* and 8 *Greenhouse gas emissions*, follow standard approaches specified in the NGER Act.

The chapters include a summary of the key features of requirements under the NGER Act and relate them to establishing reporting requirements for programs.

For more detail on reporting of greenhouse and energy data under the NGER Act, please refer to the legislation and guideline documents directly. All documents listed below are available on the Department of Climate Change website at: www.climatechange.gov.au/reporting.

NGER Legislation:

- > *National Greenhouse and Energy Reporting Act 2007*
- > *National Greenhouse and Energy Reporting Regulations 2008*
- > *National Greenhouse and Energy Reporting (Measurement) Determination 2008*
- > National Greenhouse and Energy Reporting (Audit) Determination - under development
- > National Greenhouse and Energy Reporting Auditor Registration Instrument - under development

Guidelines:

- > National Greenhouse and Energy Reporting Guidelines
- > National Greenhouse and Energy Reporting (Measurement) Technical Guidelines 2008 v1.1

Chapters 9 *Intensity indicators*, 10 *Energy audits and assessments*, 11 *Energy savings and greenhouse gas reductions*, 12 *Action plans* and 13 *Energy and greenhouse gas emissions projections*, outline standard approaches agreed by jurisdictions through the Experts Group on Streamlining Greenhouse and Energy Reporting under COAG.



5 Greenhouse and energy accounting and reporting principles

Greenhouse gas and energy accounting and reporting principles can be used to underpin and guide entities in developing greenhouse gas and energy inventories for both voluntary and mandatory reporting. Adherence to these principles helps to ensure that reported information represents a faithful, true and fair account of an organisation's greenhouse gas emissions, energy consumption or production.

The WRI/WBCSD published a list of greenhouse gas accounting and reporting principles in the GHG Protocol in September 2001 (www.ghgprotocol.org/standards/corporate-standard). These were based on generally accepted financial accounting and reporting principles, taking into account greenhouse specific issues. These principles also underpin the International Standards for greenhouse gas accounting, reporting and verification (ISO AS 14064 series) and are used by governments, non-government organisations and businesses internationally.

Whilst there is not an internationally accepted protocol for corporate energy consumption and production reporting, the Global Reporting Initiative G3 Guidelines provide principles for sustainability reporting that include energy consumption. The G3 principles cover similar concepts to the GHG Protocol, but break a number of principles down into a greater level of detail or disaggregation. The principles also focus more on the voluntary disclosure aspects of reporting.

This chapter outlines the GHG Protocol principles and their relevance for use in government programs requiring corporate emissions and energy reporting. For program managers wishing to specify a greater level of detail on principles, the G3 Guidelines are a useful resource.

The principles can be used by program managers when designing reporting requirements as well as to guide entities when reporting.

5.1 Relevance

The relevance of a greenhouse gas or energy report relates to both its format and content. The report should contain information that users, both internal and external to a company, need for decision making. A greenhouse or energy report should cover all greenhouse gas emissions, energy consumption or energy production information relevant to the users of the report and should be presented in a format that is accessible to the range of report users.

5.2 Completeness

The principle of completeness requires that all relevant greenhouse gas emissions, energy consumption or production sources or activities within the inventory boundary be accounted for so that a comprehensive and meaningful inventory is compiled.

A complete greenhouse gas emissions report under the NGER Act would include all greenhouse gas emissions (scope 1 & 2) for all six Kyoto gases from all identifiable emission sources within the energy, fugitive, industrial process and waste sectors as identified by the NGER (Measurement) Determination.

A complete report for the Energy Efficiency Opportunities (EEO) program would include all types of energy consumption identified in the legislation together with energy savings information.

In the context of establishing accounting and reporting requirements for a greenhouse or energy program the principle of completeness indicates that program requirements, where possible, should cover all material greenhouse gas emissions or energy activities and sources relevant to the program's objectives. This needs to be balanced against cost effectiveness considerations during both program design and implementation.

5.3 Consistency

The consistent application of accounting approaches, boundaries and methodologies enables meaningful comparisons of emissions and energy over time. Consistency in accounting across an organisation or multiple organisations allows data to be aggregated at regional, state and national levels.

If there are changes to accounting approaches, boundaries and methodologies or other material aspects of a report, they need to be transparently documented and justified.

In programs which require greenhouse gas emissions and energy reporting, consistency is achieved through establishing agreed accounting approaches, boundaries and methodologies. Where programs provide flexibility in relation to these or other elements it is important that the principle of consistency across time be reinforced in program guidance.

Under the NGER Act, corporations report consistently using specified boundaries and specified methods for calculating emissions, energy consumption and production.

5.4 Transparency

Transparency is essential to the production of a credible and auditable greenhouse or energy report.

A transparent report will identify and justify specific exclusions or inclusions, provide references for methodologies and data sources, and present information neutrally and factually.

Transparency enables both internal reviewers and external auditors to attest to the credibility of a report.

Greenhouse and energy reporting programs can encourage transparency through program design elements such as clearly documented reporting obligations in a publicly accessible format, public reporting requirements and 'third party' audit provisions.

5.5 Accuracy

The accuracy of data in a greenhouse or energy report should be sufficient for users to make decisions with reasonable assurance of the integrity of the reported information.

This means that greenhouse gas emissions or energy measurements, estimates or calculations should be systemically neither over nor under the actual emissions or energy value as far as can be judged.

For an emissions or energy report this could include ensuring completeness such that no material emissions or energy sources are excluded, minimising uncertainty in quantification as far as is practicable and avoiding calculation errors.



6 Reporting boundaries and entity definitions

NGER Act obligations only apply to constitutional corporations, however the NGER definitions outlined in this chapter and following chapters are covered in relation to ‘entities’, recognising that a number of programs cover a broader range of ‘entities’ than the NGER Act.

When designing greenhouse or energy reporting programs, the definitions used to identify entities for reporting and the reporting boundaries for those entities should be consistent with the approach under the NGER Act. This section outlines how entities can be defined, and the boundaries for reporting greenhouse and energy data established, such that program participants can submit a report under the streamlined NGER System.

Program developers and managers can choose to apply reporting obligations at different levels within a corporate structure or organisation. For example some programs apply obligations at the site or facility level, whilst some programs apply obligations to whole organisations/corporations (or corporate groups).

The NGER Act uses a facility as the base unit for reporting obligations. The definition of facility under the NGER Act is outlined in section 6.3. In order for corporations to report consistently across programs the facility definition needs to be the same (or achieve the same outcome).

Obligations for reporting on a facility also need to apply to the same entity. The NGER Act requires that the entity with ‘operational control’ over a facility takes on reporting obligations. Section 6.6 outlines the NGER Act definition of operational control.

If reporting is required at the corporate level, the NGER Act specifies definitions for corporate groups and controlling corporations, such that data can be aggregated. These are outlined in section 6.1.

6.1 Defining corporate level reporting obligations

Under the NGER Act, obligations apply to controlling corporations on behalf of their corporate group. The following sections outline the definitions of controlling corporations and corporate groups under the NGER Act.

6.1.1 Controlling corporation

A controlling corporation is a corporation that does not have a holding company in Australia. This is generally the corporation at the top of the corporate hierarchy in Australia. However, foreign corporations may also be controlling corporations.

6.1.2 Corporate groups

A controlling corporation's group may include the following members, in addition to the controlling corporation itself:

- > subsidiaries
- > joint ventures; and
- > partnerships.

A subsidiary

Under the NGER Act a 'subsidiary' has the same meaning as that expressed in section 46 of the *Corporations Act 2001*. Any subsidiary under the Corporations Act would be considered part of the controlling corporation's group.

Joint ventures and partnerships

Responsibility for reporting on joint ventures and partnerships is specified in section 8 of the NGER Act.

6.2 Defining business units

The NGER Regulations 2.01A defines a business unit:

“A unit that is recognised by a registered corporation as having administrative responsibility for one or more facilities of the corporation.”

Under the NGER Act entities may choose to report and request information be disclosed according to business units. This is in addition to reporting specified information for the corporate group.

Program managers or designers may choose to allow entities to report greenhouse or energy information according to business units. Greenhouse gas emissions and/or energy by business unit can be useful for understanding the intensity of particular production processes or for providing meaningful information to the public on the carbon or energy footprint of particular product or service lines.

6.3 Defining a facility

The NGER Act outlines the following criteria used in determining if an activity or series of activities forms a facility:

1. Activities attributed to the facility must produce greenhouse gas emissions or produce or consume energy.
2. Activities are part of a production process (this could include service activities).
3. Activities occur at a 'single site' (with the exception of networks and transport³). A corporation will also be able to attribute to a site some activities that occur away from that site (these activities are referred to as 'listed' activities and are defined in NGER Regulation 1.03).
4. Activities are attributable to a single industry sector (Section 9(3) of the NGER Act). Schedule 2 of the NGER Regulations determines the industry sectors, and NGER Regulation 4.31 contains further detail about changes to industry sectors.

Many greenhouse or energy programs use the term 'site' rather than 'facility'. A 'site' is generally equivalent to a facility in the NGER Act, however the NGER Act uses 'facility' to cover a broader range of circumstances than sites (i.e. transport activities and networks).

6.3.1 Declaration of a facility by a regulatory authority

Under the NGER Act, in certain circumstances the Regulator can declare an activity or series of activities to be a facility. Program designers may wish to build a similar provision into greenhouse or energy programs, to use in circumstances where disputes arise over the correct definition of a facility boundary for reporting. Section 54 of the NGER Act provides more detail on how the Regulator may declare a facility.

6.3.2 Facility specific reporting obligations

Under the NGER Act, depending on the size of a facility, entities may be required to aggregate or disaggregate data from the facility. Aggregation is used as a way of simplifying reporting for small facilities.

For the purposes of mandatory reporting under the NGER Act, the National Greenhouse and Energy Reporting Guidelines (NGER Reporting Guidelines) identify three types of facility. The NGER legislation does not define these facility types, however facilities are identified in this way in

3 Different facility rules apply when the principal activity of a facility is attributable to the transport sector. Instead of the transport facility being attributed to a single address, it is attributed to a state or territory. This is because of the non-stationary nature of transport. For reporting purposes, the state or territory in which fuel is purchased is deemed to always be the state or territory the fuel is consumed in, even though in practice the fuel might be consumed elsewhere. Ancillary activities for the transport sector are attributed to the transport facility in the same state. The NGER Reporting Guidelines (Chapter 3 Reporting Obligations) provide some examples of how to report on greenhouse gas emissions from the transport sector.

the NGER Reporting Guidelines to assist corporations assess the reporting requirements for different types of facilities.

When considering how greenhouse and energy data will be collected, program managers may wish to similarly group facilities in accordance with the three categories. However, some programs may identify different aggregation options in relation to different sized facilities. The NGER categories are listed below:

- > *large facilities*—greater than 25 kilotonnes of CO₂-e or 100 terajoules
- > *medium facilities*—greater than 3 kilotonnes CO₂-e or 15 terajoules and less than 25 kilotonnes of CO₂-e or 100 terajoules
- > *small facilities*—3 kilotonnes or less of CO₂-e or 15 terajoules or less.

Under the NGER Act, facilities meeting a facility-level threshold (*large facilities*) are subject to the most detailed reporting requirements.

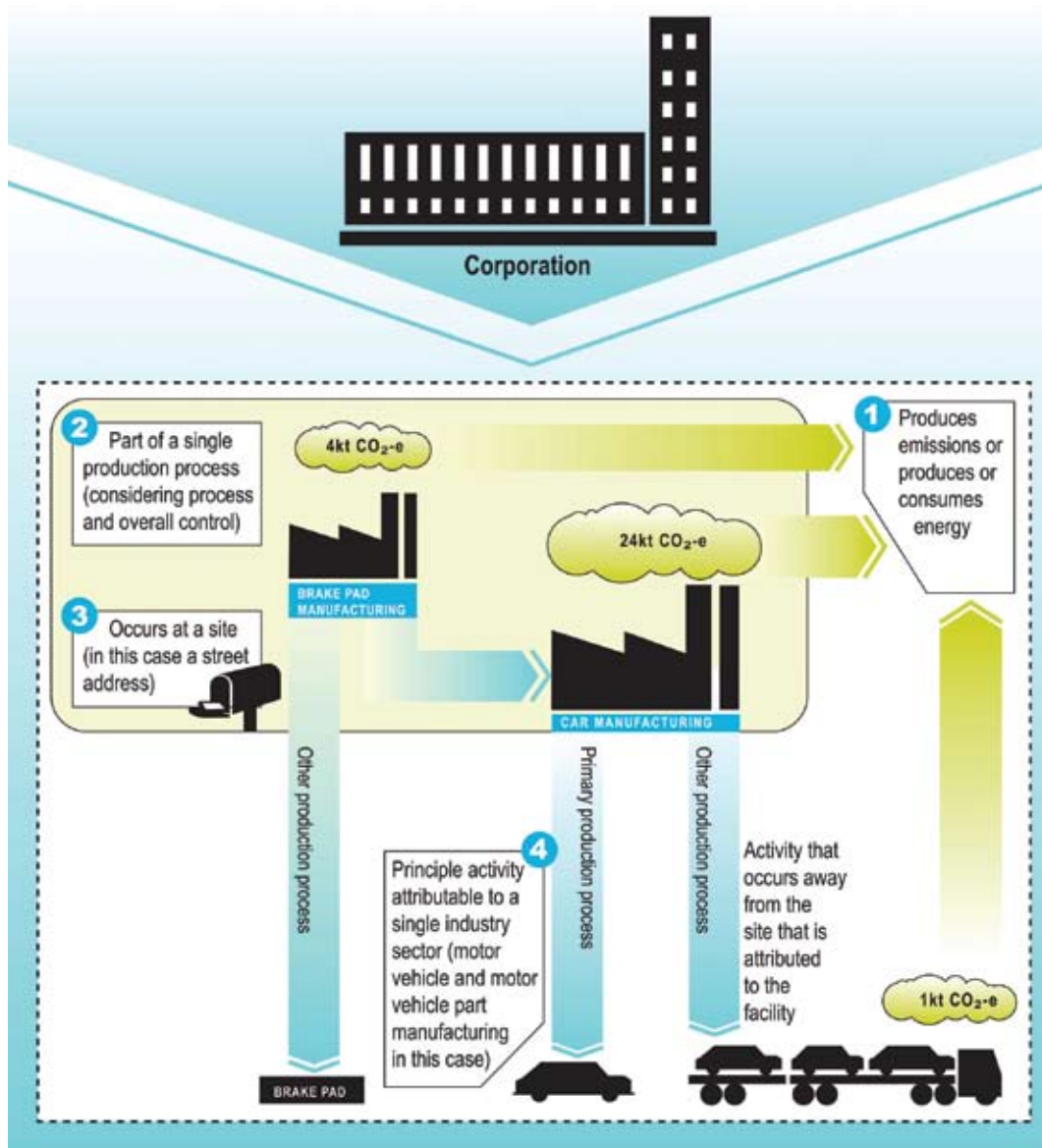
Program designers and managers should review the NGER Reporting Guidelines to check whether they need to apply different aggregation rules.

Box 6.1: Example - Determining whether activities constitute a facility

Figure 6.1 provides an example of determining whether activities constitute a facility. The example would likely be classified as a facility because it satisfies the four conditions described above.

1. The activities from the facility produce greenhouse gas emissions or produce or consume energy. The manufacturing process and other activities attributed to the facility produce greenhouse gas emissions (29 kt CO₂-e) and consume energy.
2. The activities are part of a single production process. In the example the principle activity is ‘motor vehicle and motor vehicle part manufacturing’. Other production processes that occur at the facility, in this case the manufacture of brake pads, are considered part of the same facility because the manufacture of brake pads is under the overall control of the same controlling corporation that has operational control over the entire facility.
3. The activities occur at a single site, in this case the street address, and the principle activity does not come under the transport or network industry sectors.
4. The principal activity is attributable to a single industry sector. The greenhouse gas emissions and energy production and consumption for this facility are reported against the ‘motor vehicle and motor vehicle part manufacturing industry sector’. In this example motor vehicle manufacturing is the activity that results in the creation of a product or service for sale on the market and that produces the greatest value of all the activities in the series.

Figure 6.1: Determining whether activities constitute a facility: an example



6.4 Sub facility reporting

In order to gain meaningful statistics, greenhouse gas emissions and energy data reported under the NGER Act from some types of facilities must be identified separately or reported at a sub-facility level.

Facilities generating electricity on site: Corporations operating a facility with on-site electricity generation are required to separately identify the amounts of fuel used (energy consumed) by the generator.⁴ The corporation must also identify the amount of electricity that was produced during the reporting year for use both in the facility and outside the facility.

This information is used for energy statistics and to help understand the fuel and greenhouse gas emissions mix of grid electricity.

Facilities that cross state or territory borders: If a pipeline, transmission and distribution activity or other network crosses state or territory borders, corporations must report data disaggregated by state or territory and the greenhouse gas emissions and energy associated with each state or territory reported pro rata.

Major contractors at facilities: Emissions and energy from major contractors at ‘*large facilities*’ are to be identified separately but attributed to the industry sector the facility data are reported against. Major contractors are to be identified by their ABN (Australian Business Number).

Vertically integrated production processes: If a corporation has operational control over a vertically integrated production process at more than one site, it can report in one of two ways:

> as a facility at each separate physical location at which the vertically integrated process occurs;

or

> as a group of facilities for the entire vertically integrated production process. Essentially, greenhouse gas emissions and energy are aggregated and the facilities are reported as one.

Vertical integration: Vertical integration occurs when the output of one stage of production becomes an input for the next stage and the output of the final stage is sold on the market. The different stages of the production process can take place at one physical location or at multiple locations. Outputs from an earlier stage of production in a vertically integrated facility can also be sold on the market, although those outputs must not account for the highest value for that facility.

⁴ The additional data item is required only for a generator that has the capacity to produce 30 megawatts of electricity and produces more than 30 gigawatt-hours of electricity.

A steel manufacturer may be an example of vertical integration if the operator of the steel mill also operates the mine the raw product is obtained from, the transport network used to transport raw material to the steel mill or to customers (for example, a rail network or a truck fleet) or any intermediate processing plants or export facilities. Similarly, a wine manufacturer might be vertically integrated if it also operates vineyards, trucks to transport grapes to the winery, a distribution network or wine wholesaling or retailing businesses.

Program designers and managers should review the NGER Reporting Guidelines for more information on reporting requirements for vertically integrated processes.

6.5 Activity data

Under the NGER Act greenhouse and energy information is reported for facilities as activity data. For energy, activity data for a facility is the fuel consumed or produced. For greenhouse gas emissions activity data must be reported by source. The activity data needs to cover the following sources:

- > energy, which includes greenhouse gas emissions arising from the combustion of fossil fuels to produce stationary energy and for transport purposes;
- > industrial processes, which includes the consumption of synthetic gases
- > fugitive emissions; and
- > waste.

Energy and greenhouse gas emissions are not required to be reported by equipment type, only energy type, unless otherwise stated in the NGER (Measurement) Determination.

6.6 Determining operational control

Under the NGER Act (s11), operational control is used to allocate responsibility for reporting energy and greenhouse gas emissions from individual facilities. The concept is used in international reporting standards such as the International Organization for Standardization's ISO 14064-1 and by the WRI/WBCSD in the GHG Protocol.

The GHG Protocol refers to two distinct approaches which can be used to consolidate greenhouse gas emissions. These approaches can also be applied to consolidating energy. These are the control approach, which can be classified as operational control or financial control and the equity share approach. Under the NGER Act, entities report on greenhouse gas emissions and energy relating to facilities over which they have operational control.

An entity is considered to have operational control over a facility if it has authority to introduce and implement operating, health and safety, and environmental policies. Only one entity can have operational control over a facility at any time.

If there is uncertainty about which entity has operational control over a facility, the entity deemed to have operational control will be the one with the greatest authority to introduce and implement operating and environmental policies.

6.6.1 Contractors and subcontractors

The entity deemed to have operational control over a facility is responsible for reporting *all* greenhouse gas emissions and energy data associated with that facility—including greenhouse gas emissions from and energy consumed and produced by the activities of contractors and subcontractors.

An example of operational control in practice is contract mining in which the owner of the mine has contracted a company to run the mine site. The owner and the contractor might have equivalent capacity to introduce policies, but the contractor implements all the policies without input from the owner. In this situation the contractor would likely be considered to have operational control.

6.6.2 Declaration of operational control by a regulatory authority

Similar to the provisions in place under the NGER Act to assist corporations define a facility, in certain circumstances the Regulator can make determinations in relation to operational control, either in response to an application from a corporation or at its own initiative. Program managers may wish to build a similar provision into the design of greenhouse or energy programs, to use in circumstances where disputes arise over the correct allocation of operational control for reporting purposes. Section 55 of the NGER Act provides more detail on how the Regulator may declare operational control.



7

Energy consumption and production

This section includes definitions of the key terms used in the NGER Act, and outlines the approach used to measure and report energy consumption and production. The definitions and methodologies described in this section should be used as a basis for design of new energy or greenhouse programs, and in aligning existing programs with the NGER System.

7.1 Energy production

Under the NGER Act corporations are required to report on all energy produced by facilities.

‘Energy production’ is defined in NGER Regulation 2.23:

Production of energy, in relation to a facility, means any one of the following:

- (a) the extraction or capture of energy from natural sources for final consumption by or from the operation of the facility or for use other than in operation of the facility;*
- (b) the manufacture of energy by the conversion of energy from one form to another form for final consumption by or from the operation of the facility or for use other than in the operation of the facility.*

Appendix C provides a list of reportable fuels and energy commodities under Schedule 1 of the NGER Regulations.

7.1.1 Estimating energy production

Under the NGER Act, if the operation of a facility of the corporation produces energy during the reporting year, the corporation’s report must include information for the facility identifying the type (see Appendix C) and amount of energy produced during the reporting year. The NGER (Measurement) Determination outlines methodologies for estimating energy production.

Part 6.1 of the *National Greenhouse and Energy Reporting (Measurement) Technical Guidelines 2008 v1.1* outlines how the energy content of energy produced from the operation of a facility during a year should be estimated.

Division 4.4 of the NGER Regulations specifies information relating to energy production that must be included in a registered corporation's report for a reporting year.

For example, if the operation of a facility of the corporation produces electricity, the corporation must report whether the electricity was produced using: thermal generation; geothermal generation; solar generation; wind generation; water generation; or biogas generation. The corporation's report must identify the amount of the electricity that was produced for use in the facility and produced for use outside the facility.

7.2 Energy consumption

'Energy consumption' is defined in NGER Regulation 2.23:

Consumption of energy, in relation to a facility, means the use or disposal of energy from the operation of the facility including own-use and losses in extraction, production and transmission.

Appendix C provides a list of the reportable fuels and energy commodities under Schedule 1 of the NGER Regulations.

7.2.1 Estimating energy consumption

Under the NGER Act, energy consumption is reported by energy type (refer to Appendix C). The NGER (Measurement) Determination outlines methodologies for estimating energy consumption.

If the operation of a facility consumes energy during a reporting year, the NGER Act specifies that a report must include information for the facility identifying separately:

(a) *the amount and type of energy consumed by means of combustion for:*

- (i) *producing electricity;*
- (ii) *producing a chemical product or metal product;*
- (iii) *transport, other than transport that involves the consumption of international bunker fuel; and*
- (iv) *a purpose other than a purpose mentioned in subparagraphs (i) to (iii).*

(b) *the amount of energy consumed by a means other than combustion (if this amount is greater than 20 tonnes of solid fuel, 13 000 cubic metres of gaseous fuel or 15 kiloliters of liquid fuel).*

c) *the criteria used by the corporation to estimate the amount of the energy consumed.*

d) *The methods used to estimate greenhouse gas emissions from the consumption of energy.*

If the operation of a facility consumes energy in producing a chemical product containing carbon, the report for the facility must include information identifying the amount and type of energy consumed in producing the chemical product. Consumption of solar, water, wind and geothermal energy for electricity generation should identify the amount of these types of energy subsequently converted into electricity.

7.3 Incidental energy consumption and production

Incidental energy production and consumption are small amounts of energy produced or consumed at a facility. The different requirements for these sources can reduce the burden and cost of reporting data for energy sources, which might be difficult or costly to obtain.

If the energy consumed at or produced from a facility are considered incidental, entities can estimate the amounts using a method of their own choosing. Energy produced or consumed must still be divided by energy type, as listed in Appendix C.

Table 7.1 shows the upper limits for amounts of energy consumption or production that may be considered incidental. These limits are maximum amounts for single sources or aggregated sources.

Section 8.4 outlines the criteria for estimating incidental greenhouse gases.

Table 7.1: Energy amounts that can be considered incidental: upper limits

Energy from within the facility	Energy consumed	Energy produced
Actual amount from an individual source	15 TJ	15 TJ
Percentage of facility totals from an individual source	0.5%	0.5%
Actual amount from sources that can be aggregated	60 TJ	60 TJ
Percentage of facility totals that can be aggregated	2%	2%

Two other conditions also apply:

- > Energy consumption or production points may be treated as ‘incidental’ only if more accurate estimation is difficult or expensive.
- > The data are not otherwise required for reporting in another government program.

The principles of transparency, comparability, accuracy⁵ and completeness, as described in chapter 5, should be adhered to when determining application of incidental emissions and energy rules.

⁵ Further guidance about accuracy and estimating incidental emissions is provided in the NGER Technical Guidelines.



8

Greenhouse gas emissions

This section includes definitions of the key terms used in the NGER Act, and outlines the approach used to measure and report greenhouse gas emissions. The definitions and methodologies described in this section should be used as a basis for designing new greenhouse and energy programs, and in aligning existing programs with the NGER System.

8.1 Greenhouse gas coverage

The NGER Act defines a greenhouse gas as:

- a. Carbon dioxide; or
- b. Methane; or
- c. Nitrous oxide; or
- d. Sulphur hexafluoride; or
- e. A hydrofluorocarbon of a kind specified in regulations; or
- f. A perfluorocarbon of a kind specified in regulations.

The gases included under this definition are consistent with the six Kyoto Protocol classes of gases.

Appendix A shows the full list of greenhouse gases that must be reported under the NGER Act. Program designers should only cover the six Kyoto gases and avoid requiring reporting of non-Kyoto gases wherever possible.

8.2 Greenhouse gas emissions

For the purposes of the NGER Act ‘emissions’ means the release of greenhouse gases into the atmosphere. This covers direct releases of greenhouse gases (scope 1 emissions) and certain indirect releases of greenhouse gasses (scope 2 emissions).

The terms ‘scope 1’, ‘scope 2’ and ‘scope 3’ are used in a number of Australian and international programs and standards and are defined in the GHG Protocol and ISO 14064-1.

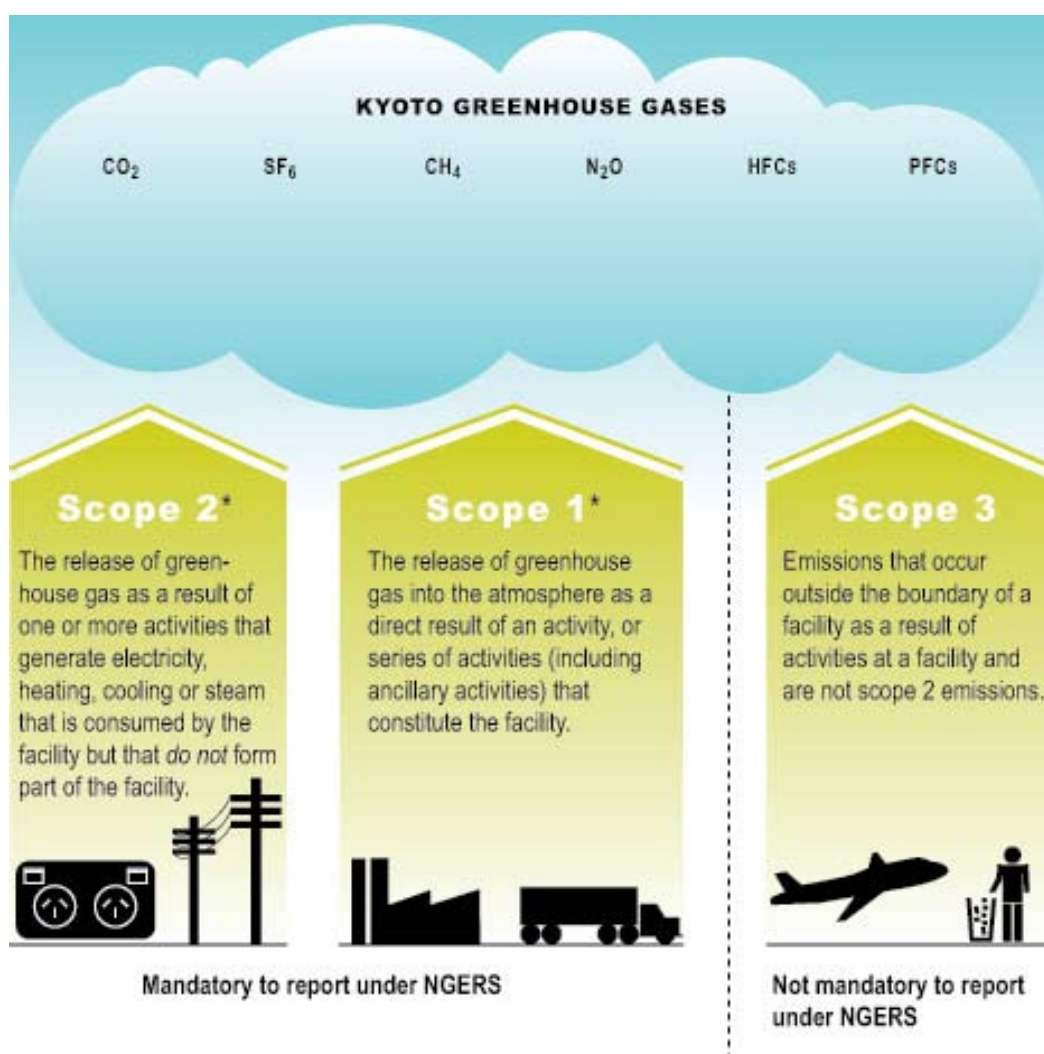
Scope 3 emissions are not defined in the NGER legislation as reporting them is not mandatory. Scope 3 emissions are greenhouse gas emissions (other than scope 2 emissions) that are generated in the wider economy as a consequence of a facility's activities but that are physically produced by another facility.

'Emissions' are defined in NGER Regulation 2.23.

A 'source' means a source of emissions.

Figure 8.1 shows examples of scope 1, 2 and 3 greenhouse gas emissions. In this example scope 1 emissions are produced by activities at, or attributed to, the facility such as an industrial process, or transport activities that are attributed to this facility. The scope 2 emissions for this facility are consumption of electricity that has been produced at another site (does not form part of the facility). Employee's business travel on a commercial airline or waste that is treated or stored off-site are examples of scope 3 emissions.

Figure 8.1: Scope 1, 2 and 3 greenhouse gas emissions: examples



* The definitions of scope 1 and scope 2 emissions are taken from NGER Regulation 2.23.

8.3 Estimating greenhouse gas emissions

The NGER Act specifies that greenhouse gases should be measured in carbon dioxide equivalents (CO₂-e) and outlines that this equivalence be determined by multiplying the amount of gas by a value specified in the NGER Regulations. This value is commonly known as the Global Warming Potential (GWP) of a greenhouse gas.

GWP is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale that compares a gas with the same mass of carbon dioxide and is calculated over a specific time interval.

A list of the GWPs of each greenhouse gas covered by the NGER Act is included in NGER Regulation 2.02. More information on GWP values and how they are used in calculating greenhouse gas emissions is also provided in the *National Greenhouse and Energy Reporting Technical Guidelines*.

Emissions factors and methods, as described in the NGER (Measurement) Determination, take the GWP of different gases into account. GWPs are also factored into OSCAR and are automatically applied to convert greenhouse gas emissions to CO₂-e.

Under the NGER Act, greenhouse gas emissions are reported by energy or source type. Appendix B provides examples of likely sources of greenhouse gas emissions for activities in some industry sectors.

8.3.1 Methods

The NGER (Measurement) Determination outlines four methods that can be used to estimate greenhouse gas emissions. Under the NGER Act, corporations report which methods they are using.

Broadly, the four methods are:

- > *method 1*—the default methods, derived directly from the methods used for the National Greenhouse Accounts and the same as those used in the Online System for Comprehensive Activity Reporting (OSCAR).
- > *method 2*—a facility-specific method using industry sampling and Australian or international standards listed in the Determination or equivalent for analysis.
- > *method 3*—a facility-specific method using Australian or international standards listed in the Determination or equivalent standards for both sampling and analysis of fuels and raw materials. Method 3 is very similar to method 2, but it requires reporters to comply with Australian or equivalent documentary standards for sampling.
- > *method 4*—direct monitoring of emission systems, on either a continuous or a periodic basis.

8.4 Estimating incidental greenhouse gas emissions

Incidental greenhouse gas emissions are small sources of greenhouse gas emissions from a facility. Different requirements for these sources can reduce the burden and cost of reporting data for small greenhouse gas emissions sources, which might be difficult or costly to obtain.

If greenhouse gas emissions from a facility are considered incidental, under the NGER Act, corporations can estimate the amounts using a method of their own choosing. Incidental greenhouse gas emissions must be separated by source.

Table 8.1 shows the upper limits for amounts of greenhouse gas emissions that may be considered incidental. These limits are maximum amounts for single sources or aggregated sources. Section 7.3 outlines criteria for estimating incidental energy consumption and production.

Table 8.1: Greenhouse gas emissions amounts that can be considered incidental: upper limits

Emissions from within the facility	Emissions (CO ₂ -e)
Actual amount from an individual source	3 kt
Percentage of facility totals from an individual source	0.5%
Actual amount from sources that can be aggregated	12 kt
Percentage of facility totals that can be aggregated	2%

Note: Incidental greenhouse gas emissions are bound by whichever is the lesser of the percentage and the actual amount.

Two other conditions also apply:

- > Greenhouse gas emissions points may be treated as ‘incidental’ only if more accurate estimation is difficult or expensive.
- > The data are not otherwise required for reporting in another government program.

The principles of transparency, comparability, accuracy⁶ and completeness, as described in chapter 5 of this Protocol, should be adhered to when estimating incidental emissions.

⁶ Further guidance about accuracy and estimating incidental emissions is provided in the NGER Technical Guidelines.



9

Intensity indicators

Intensity indicators are used to track energy consumption and greenhouse gas emissions performance over time. Intensity indicators can be valuable as performance indicators that are independent of entity growth (e.g., production output levels). They can also provide helpful benchmarks for achieving energy savings and greenhouse gas emissions reductions. In some cases intensity indicators enable participants to compare their performance with industry best practice.

Currently, program participants can choose the intensity indicator(s) most relevant to their facility(s) or business. Whilst the current arrangement provides flexibility for business, the inherent diversity of businesses and the circumstances of individual entities results in a wide range of intensity indicators. To achieve the objective of streamlining, which is to report greenhouse and energy data in a consistent and cost effective manner, it is preferable that intensity indicators be consistent over time and across programs.

This chapter of the Protocol provides a standard set of energy and greenhouse intensity indicators that should be offered to participants in energy and greenhouse programs. Participants should be able to nominate appropriate intensity indicators from the list provided or develop other indicators if required.

9.1 Defining intensity indicators

An intensity indicator shows an entity's normalised greenhouse gas emissions or energy consumption divided by a selected business metric. Intensity indicators provide information on performance relating to business type or size. Indicators also allow for performance to be easily tracked and comparisons made over time. Intensity indicators are also often referred to as efficiency indicators or business activity indicators.

This Protocol addresses reporting of both energy intensity indicators and greenhouse gas intensity indicators and for the purposes of this Protocol, "intensity" refers to both energy intensity and greenhouse gas intensity. The definitions for both energy and greenhouse gas intensity indicators are set out in Box 9.1: Definitions.

Box 9.1: Definitions

- > **Energy Intensity Indicator:** a ratio that expresses the energy consumption of an entity per business metric.
- > **Greenhouse Gas Intensity Indicator:** a ratio that expresses the greenhouse gas emissions of an entity per business metric.
- > A **Business Metric** is either a unit of physical activity or unit of output. Relevant measures of physical activity or output include:
 - Production output – physical measures of output such as tonnes of product produced;
 - Value added* – the wealth created by a company is defined as its value added and can be calculated as follows:
 - Value added = Earnings less Costs of consumed goods and services
 - An estimate of a firm's value added can therefore be derived from the components of a firm or company's income or profit and loss statement; and
 - Relevant characteristics of the business such as floor area or number of employees.

* There are a number of ways that value add can be calculated at the firm level, reflecting some inherent difficulties that can arise when defining value add at the firm level. Notwithstanding this, for the purposes of comparing energy intensity over time, estimates of emissions per dollar of value add are a helpful indicator.

9.2 Standard approach to intensity indicators

Programs should encourage entities to use intensity indicator(s) chosen for their operations consistently across all programs and over time. Varying intensity indicators limits the ability to make comparisons across programs and time and also imposes a greater reporting burden on program participants.

Time series data considerably enhances the value of intensity indicators as it allows trend analysis to be undertaken. Providing the appropriate intensity statistics are available, a consistent approach would enable entities to benchmark sites or groups within their organisation. If consistent indicators are used across sectors it could enable comparison with sector level intensity such as with statistics published by the Australian Bureau of Agricultural Economics or internationally such as those published by the International Energy Agency.

This approach also allows program managers to compare performance across time, programs and sectors and enables more robust policy development and evaluation of program outcomes.

9.3 Calculating intensity indicators

To calculate intensity indicators, two elements are required; the numerator is the energy consumption or the greenhouse gas emission and the denominator is the business metric. These should be at the same level, for example, corporation or business units. Intensity indicators are calculated by dividing energy consumption or greenhouse gas emissions by the selected business metric. This equation is set out in Box 9.2.

Box 9.2: Equations for energy and greenhouse gas intensity indicators

Energy Intensity Indicator	=	Energy consumption (GJ) Business metric
Greenhouse Gas Intensity Indicator	=	GHG emissions (t CO ₂ -e) Business metric

Energy indicators should be reported in gigajoules per business metric and greenhouse gas intensity should be reported in tonnes of carbon dioxide equivalents (t CO₂-e) per business metric. If participants are using the online reporting tool, it will perform background calculations to convert a range of different units into gigajoules. When program participants use the NGER (Measurement) Determination method 1 to calculate greenhouse gas emissions, the online reporting tool will calculate emissions in t CO₂-e from energy and other data.

9.4 Standard approach to greenhouse gas emissions and energy data

Chapters 7 *Energy consumption and production* and 8 *Greenhouse gas emissions* describe the approach to calculating and reporting greenhouse gas emissions and energy consumption and production, in line with the NGER Act. The NGER Act requires corporations to report scope 1 and scope 2 emissions only. Therefore any mandatory reporting of greenhouse gas intensity indicators should be based on scope 1 and scope 2 emissions only.

Providing the methodology used is consistent with reporting of actual energy consumption and greenhouse gas emissions, program participants can choose to calculate intensity indicators at any of the following levels. These terms are defined in chapter 6 of this Protocol:

- > Corporate;
- > Business unit;
- > Facility;
- > Sub-facility; or
- > Activity.

As with reporting of greenhouse gas emissions, greenhouse gas intensity indicators should be based on gross greenhouse gas emissions rather than using a net figure (i.e. a figure that takes into account the effect of removals and offsets). This is suggested as there are inherent uncertainties in quantification of offsets and gross figures provide increased credibility and transparency. Additionally, companies can elect to report net greenhouse gas emissions intensity indicators in addition to gross greenhouse gas emissions intensity indicators.

9.5 Standard approach to business metrics

Business metrics are units of physical activity or units of output that represent the business operations (refer Box 9.1). Program managers can allow participants to choose the most appropriate business metric for their operations, but to ensure consistency in the use of business metrics across programs, participants should be encouraged to select an appropriate business metric from either the generic or sector specific lists provided in this chapter.

Where it is not appropriate to choose a business metric from the generic or sector specific lists, entities may develop a company specific business metric in conjunction with the relevant program managers. If considered relevant and agreed by all program managers, a new business metric may be added to the sector specific list in this Protocol.

Program managers should encourage participants to strive for the highest possible level of accuracy for business metrics as the accuracy of business metrics data will in turn affect the accuracy of the greenhouse gas or energy intensity. For example a breakdown of energy consumption by end-use can provide much greater accuracy than a single energy consumption figure for a whole facility. However, it is noted that detailed data can be costly to collect and program managers should carefully consider how best to achieve a balance between accuracy and cost.

9.5.1 Generic business metrics

Generic business metric categories for use across a range of sectors are outlined in Table 9.1. These are based on business metrics currently used in the ‘Greenhouse Challenge Plus Program’ and ‘NABERS’ (the National Australian Built Environment Rating System), a national performance based rating system for existing buildings. The generic business metric categories can be tailored to an entity’s operations by specifying the actual units reported. By selecting a number of business metrics for reporting, entities can develop a set of intensity indicators appropriate to their operations.

Table 9.1: Generic business metrics

Business metric category	Business metric category units	Example business metric specification
Quantity	Units of production	Cars, bottle caps, labels
Work	Basic unit is task kilometre	Tonne kilometre, passenger kilometre
Area	Basic unit is square metre	Carpet, floor space
Volume	Basic unit is cubic metre or kilolitre	Coal, logs, pulpwood, beverages
Mass	Basic unit is kilogram or tonne	Waste input, gold, beef, chicken
Dollar	Basic unit is \$AUD	Revenue, turnover, costs, value added
Personnel	Basic unit is a person	Full time employee equivalent, full time student equivalent, member

9.5.2 Sector specific business metrics

Some sectors involve energy and emissions intensive processes that have received attention from international bodies, such as the International Energy Agency (IEA). For these sectors appropriate standard intensity indicators are described. The IEA has developed disaggregated indicators for iron and steel, cement, pulp and paper, chemicals and petrochemicals, aluminum, and services.⁷

The Australian Government has also described business metrics to be used for the assessment of potential Emissions Intensive Trade Exposed (EITE) industries, which may be eligible for assistance through the EITE assistance program under the Carbon Pollution Reduction Scheme (CPRS). These metrics are provided within the approved activity definitions for each sector.⁸ Descriptions of business metrics in the EITE activity definitions are often based on product purity requirements, for example tonnes of silicon with a purity equal to 98 per cent.

A list of sector specific indicators is provided at Appendix E. The list is drawn from both the IEA list and the activity definitions within the EITE Industry Assistance guidelines. As consensus is reached on intensity indicators to be applied to other energy and greenhouse gas emissions intensive sectors, these metrics can be added to the Protocol.

7 International Energy Agency (2008), p.30, Worldwide Trends in Energy Use and Efficiency, Key Insights from IEA Indicator Analysis.

8 Department of Climate Change, Emissions Intensive Trade Exposed Industry Assistance, Activity Definitions factsheets. Available at <http://www.climatechange.gov.au/whitepaper/assistance/index.html>



10 Energy audits and assessments

Entities may be mandatory participants in a number of programs that require energy audits or assessments. Entities participating in multiple programs should be able to undertake one energy audit or assessment to satisfy the auditing or assessment requirements of all programs in which they participate. This chapter provides guidance to program managers to ensure that participants can undertake one audit or assessment and achieve streamlining of reporting. It applies to both existing and future programs and recognises that existing and future programs may employ different techniques to achieve this outcome.

Energy audits are distinct from external audits under the NGER Act. The NGER Act establishes auditing or assurance of greenhouse and energy reports as a key measure for monitoring corporations' compliance with the Act.

10.1 Definition of energy audit or assessment

An energy audit is an inspection, survey and analysis of energy flows in a building, process or system with the objective of understanding the energy dynamics of the system. Typically an energy audit is conducted to identify opportunities to reduce the amount of energy input into the system without negatively affecting the outputs. Beyond simply identifying sources of energy consumption, an energy audit enables identification of effective opportunities for energy savings and their prioritisation from greatest to least cost.

The exact nature and content of an audit or assessment will depend on program requirements. Australian Standard AS/NZS 3598:2000 is an industry accepted protocol for undertaking energy audits across various levels of diagnosis. It is used by some programs to define the level of energy audit suitable for their program.

For the purpose of this Protocol, the term ‘energy audit’ is equivalent to an ‘assessment’, for those familiar with the EEO program.

Effective energy audits provide entities with a measured base for current performance from which a plan to reduce or save energy can be developed. This will often also impact greenhouse gas emissions as well as other components of operations, e.g., cost of operations, reduction in operational risk or extended life of equipment.

An audit can be used to identify commitments or actions the entity will make to greenhouse gas emissions and energy use reductions. These actions are the basis of engagement under many greenhouse and energy programs.

Table 10.1 outlines the auditing requirements for existing programs included within this protocol. The aim of the table is to provide a reference for managers of new programs.

Table 10.1: Audit requirements for existing program

Program	AS Energy Audit Level 3	AS Energy Audit Level 2	Other assessment
Smart Energy Savings Plans (SESP, QLD)		✓	
Environment and Resource Efficiency Plans (EREP, VIC)			✓ (Combined audit that includes energy, water and waste)
Energy Savings Action Plans (ESAP, NSW)	✓		
Energy Efficiency Opportunities (EEO, National)			✓ (As specified in the EEO Assessment Framework in the EEO legislation)
EcoBiz (QLD)			✓

10.2 Standard approach: principle of reciprocal recognition

10.2.1 Existing programs

Entities participating in multiple programs have been and will continue to be able to undertake one energy audit to meet program needs. Given this, it must be recognised that whilst some significant synergies exist between state and national programs, existing programs have been developed with different aims and objectives. Therefore, some auditing requirements differ between programs.

Notwithstanding the above, the aim of streamlining is to reduce the auditing and assessment reporting burden on business. This can be achieved by program managers accepting, wholly or partially, the results generated from energy audits that were undertaken to satisfy other programs where the original energy audit is of an appropriate standard and currency.

Efforts to create reciprocal recognition should be targeted towards recognition between national and state programs, as a site is more likely to be subjected to a national and a state program as opposed to programs from two states. Currently, the only national program with a requirement for future audits is EEO. Some state programs have already collaborated with EEO to ensure mutual recognition between programs (refer to Box 10.1).

Reciprocal recognition is in place between EEO and ESAP, EREP and SESP.

Reciprocal recognition will be established for existing programs where a facility could be subject to similar requirements under two or more programs.

Box 10.1: Case Study: Approaching participation in an integrated way

Two existing programs, the national Energy Efficiency Opportunities (EEO) and NSW Energy Savings Action Plan (ESAP) provide an example of how program managers can ensure that organisations required to meet the obligations of both programs are able to use work undertaken for one program to wholly or partially meet the requirements of the other.

The program managers identified the key areas of differences between the two schemes as: energy definition; reporting timeframes; and the audit / assessment requirements. The program managers then worked closely together to ensure, where possible, that data reported could meet the requirements of both programs.

Some of the outcomes of this collaboration are provided below as examples of audit aspects that can be streamlined:

Management of energy – EEO’s assessment and reporting requirements drive the involvement of people, management and systems needed to track and manage energy consumption. ESAP plans include an energy management review with similar aims. The results of the ESAP review can feed into the EEO assessments.

A rigorous and comprehensive assessment – Corporations participating in EEO may develop an approach that can meet the assessment standard required by both programs. For example, a site conducting an ESAP audit can integrate EEO requirements and feed the results into the corporation’s EEO assessment.

Identifying cost effective opportunities – EEO requires that participants make decisions on opportunities with payback periods of up to four years or equivalent. Participants are free to use their own criteria to make these decisions and this facilitates alignment with other programs.

Program managers will make readily available information on reciprocal recognition agreements. The principle of reciprocal recognition also extends to recognising auditing or assessment exercises undertaken within entities as part of their business planning and not specifically undertaken as a requirement of a government energy or greenhouse program. Where such internal audits provide credible and verifiable information relevant to the program requirements, this information should be accepted by the program. An example of this is illustrated in the case study (refer to Box 10.2).

10.2.2 Future programs

In developing future programs it is necessary to acknowledge that new requirements may increase the reporting burden for participants. Opportunities exist within future programs to ensure that auditing and assessment methodologies are consistent with established programs. Therefore when developing a program, best endeavours should be made to align the new program with established programs. This can be done by identifying which other program(s) may also require reporting by

participating entities and liaising with these program(s) to understand their requirements.

Consistency can be best achieved by ensuring that the audit approach is aligned with established programs.

Box 10.2: Flexibility delivers better outcomes - Case Study

The Environment and Resource Efficiency Plans (EREP) Program design recognises that many sites were already identifying ways to improve resource efficiency through voluntary action and by participating in other resource efficiency programs.

As such, the program has been specifically designed to allow sites to build on existing work and avoid duplication of effort. Participating sites can either seek exemptions for existing plans or include existing work in their EREP.

Partial or complete exemptions from the need to prepare a plan are available for sites that have an existing plan that meets the requirements of the program. Under an exemption, alternative plans have the same legal status as an EREP in terms of implementation and reporting.

Nestlé Australia was the first to receive a complete exemption from the need to prepare a plan based on alternative plans prepared by their participating sites.

The Nestlé Company is the world's largest food and beverage company with about 265,000 employees and 481 factories in 87 countries around the world. Nestlé products have been available in Australia and New Zealand since the 1880s and today, Nestlé Oceania spans Australia, New Zealand and the Pacific Islands, with 5,700 employees, 20 factories and four distribution centres owned and operated by the Company.

Four Nestlé Australia manufacturing plants are participating in the EREP program. These sites triggered entry to the program based on their energy or water consumption, and in some cases both. The plants manufacture a range of products including evaporated milk, condensed milk, ice-cream, chocolate, chocolate coated confectionery, cereals and snack bars.

Nestlé have developed and implemented a continuous improvement program over the past four years to reduce energy, water and waste at all sites across Oceania. Known as Eco-Reduction Plans, these include:

- > annual reduction targets set by Nestle's corporate headquarters;
- > projects to reduce energy, water and waste at each site; and
- > costs, savings and payback periods associated with each action.

The plan is updated on an annual basis and lists projects to be implemented. The plans submitted in early 2008 commit Nestle to investing more than \$500,000 in resource efficiency actions across the four sites. It is estimated these actions, once fully implemented have the potential to deliver ongoing annual savings up to \$900,000, 9500 GJ of energy, 53,000 kL of water and 1400 tonnes of waste.

Box 10.2: continued

As a condition of the exemption the sites were required to provide details of the major water using and waste generating activities at sites where this information had not been provided. Nestle is also required to carry out their EEO assessments as scheduled in their Assessment and Reporting Schedule and commit to implementing any projects with a three year or less payback period by including them in an updated Eco-Reduction Plan.

To satisfy the annual EREP requirements Nestle now simply submit to EPA Victoria their annual Eco-Reduction Plans, including the outcomes of the previous year's actions.

There may be cases when the aim of the new program requires unique data or different audit approaches. In these cases, agreement on whole or partial reciprocal recognition between programs will need to be reached, prior to establishing the program.

Additional data requirements will be reviewed through an inter-jurisdictional group under COAG. This group will take on a gateway keeping role to ensure the standard data remains consistent.

10.3 Reporting energy audits and assessments

Many existing programs require the reporting of audit outcomes, including submission of audit documentation (e.g., EREP). Requirements for reporting outcomes of the energy audits under future programs should be consistent with the common action plan fields outlined in Chapter 12. Figure 12.1 includes a number of core reporting fields and will inform the development of the relevant fields and reports in OSCAR.

10.3.1 Core reporting fields

Core reporting fields currently available for energy audits and assessments are listed below.

- > Qualitative description of the energy audit process and its findings;
- > Data accuracy achieved in carrying out the audit;
- > Qualitative description of reasons for not achieving the required accuracy;
- > Assessment cost (AUD); and
- > Level of audit / assessment according to AS/NZS 3598:2000, if applicable.

In addition, program participants will have the ability to upload and submit copies of the audit reports via the online reporting tool.



11 Energy savings and greenhouse gas reductions

This chapter outlines the standard approach to calculating and reporting achieved energy savings and greenhouse gas reductions (both projected and achieved). Reporting of projected energy savings and greenhouse gas reductions is addressed in section 12.3.

11.1 Definition of energy savings

Energy savings are the achieved reduction in energy consumption, relative to baseline energy measures (either absolute consumption or intensity). This is generally as a result of implementing specific actions detailed in action plans. Energy savings may be measured in a variety of units, such as kWh for commercial and building energy management, however standard practice for reporting is to report in gigajoules (GJ). Energy savings can arise from three different categories of actions. These are energy conservation, energy efficiency and energy management. These can be further broken down into the categories discussed in section 12.3.

The definition of energy is the same as under s.2.03 of the NGER Regulations and outlined in Chapter 7.

11.2 Calculating energy savings

Existing programs do not prescribe calculation approaches for energy savings. New program designers should carefully consider the value of prescribed calculation approaches. The standard approach outlined in this Protocol is not to prescribe how energy savings should be calculated but to provide guidance on how energy savings should be reported. Program managers can allow entities to calculate energy savings by methods of their choosing and may need to provide guidance to participants to assist them in calculating their energy savings projections and achievements. Program managers may wish to refer to the following guidance documents when designing calculation and reporting standards for energy savings. Depending on the requirements of the program, entities may need to

report the chosen calculation method. Entities should use consistent approaches over time.

11.2.1 EEO Energy Savings Measurement Guide (ESMG)

The ESGM⁹, is a best practice guide to assist entities estimate, measure, evaluate and track energy savings, quantifiable costs and benefits created as a result of implementing energy efficiency opportunities. The ESGM provides practical guidance, including examples from key industry sectors.

11.2.2 Industry specific guidance

Some industries, such as the oil and gas industry, provide industry specific guidance on calculating energy savings. Where this is the case, program managers should consider the use of industry specific guidance consistently over time.

11.3 Reporting achieved energy savings

Program designers and managers should not require entities to report any other energy savings fields other than those listed below and in section 12.3.

> **Achieved energy savings**

There may be a difference between projected and achieved energy savings. Achieved energy savings can be reported per action, or at a higher level of aggregation across an entity or organisation depending on the program requirements. Energy savings can also be reported by source. Energy savings are in units of energy and, if required by the program, energy cost savings in AUD per annum. Reporting of achieved energy savings is to be accompanied by a description of the calculation method. To achieve continuity over time and to aid comparison with past performance, achieved energy savings should be reported according to the same or a more accurate methodology used for the projected energy savings. If the calculation methodology is different from the methodology used in the action plan, this may be noted as a qualitative description.

> **Other Savings** (e.g. maintenance, labour, materials)

Reported in AUD per annum.

> **Peak Use Demand Savings** (e.g. winter and summer)

> **Difference from projected energy savings**

Program managers and designers may require entities to report whether the achieved energy savings are different from the projected energy savings and the reasons for the difference.

9 Department of Resources, Energy and Tourism, Energy Savings Management Guide: How to estimate, Measure, Evaluate and Track Energy Efficiency Opportunities, 2008.

11.4 Definition of greenhouse gas reductions

Subject to further development of the NGER Act or CPRS requirements that may define greenhouse gas reductions, they are currently defined in accordance with the GHG Protocol. The definition provided in the GHG Protocol is as follows:

“A decrease in [greenhouse gas] GHG emissions ... from the atmosphere relative to baseline emissions. Primary effects will result in GHG reductions, as will some secondary effects. A project activity’s total GHG reductions are quantified as the sum of its associated primary effects(s) and any significant secondary effects. A GHG project’s total GHG reductions are quantified as the sum of the GHG reductions from each project activity.”

11.5 Calculating greenhouse gas reductions

Program managers should refer to the following guidance documents and regulations when designing reporting requirements for greenhouse gas reduction projects. There are also strong links between calculating greenhouse gas reductions and energy savings, so program managers and designers should also refer to relevant sections above.

11.5.1 The GHG Protocol

The GHG Protocol describes the principles of greenhouse gas accounting. The principles chapter of this Protocol describes the relationship between the principles and their relevance for use in government programs requiring corporate emissions reporting.

Program managers can refer to the principles in the GHG Protocol when designing reporting requirements for greenhouse gas emissions reductions.

The GHG Protocol is available at: <http://www.ghgprotocol.org>

11.5.2 Greenhouse gas project regulations

The NGER Regulations on greenhouse gas projects (currently under development) will set a standard approach for reporting of greenhouse gas reduction data. Although not mandatory, the NGER Regulations will provide comprehensive guidance for the calculating of greenhouse gas reductions for greenhouse gas projects.

For the purpose of this Protocol, the definition of a greenhouse gas project will be defined in the NGER Regulations.

11.5.3 NGER (Measurement) Determination

The methodologies and emission factors to be used to calculate greenhouse gas reductions from projects are to be consistent with the methods listed in the NGER (Measurement) Determination.

11.5.4 NGER sources

Whilst energy savings relate specifically to energy efficiency, energy conservation and energy management projects, greenhouse gas reductions to be reported may include reductions from emissions sources other than energy. Other emissions sources include waste, fugitive emissions, industrial processes, emissions of HFCs from refrigerants, agriculture and land use change and forestry. These sectors are categorised and defined in the NGER Regulations and NGER (Measurement) Determination. Program managers and program participants should refer to the NGER (Measurement) Determination for guidance on calculating and reporting different emissions sources. At present the NGER (Measurement) Determination does not provide guidance for calculating greenhouse gas emissions relating to agricultural and forestry and land use change sources (refer section 4.2). With regard to agriculture, participants may refer to the IPCC Good Practice Guidance.¹⁰

When reporting greenhouse gas reductions originating from sources other than energy, the online reporting tool will have the functionality to eliminate unnecessary reporting fields such as energy savings, whilst still allowing participants to report greenhouse gas reductions.

11.6 Reporting fields for greenhouse gas reductions

Program designers and managers should not require entities to report on any other greenhouse gas reductions fields other than those listed below and in section 12.3.

11.6.1 Greenhouse Gas Reductions

Greenhouse gas reductions should be reported in t CO₂-e per annum per action by emissions scope or, if available, by Kyoto gases.

¹⁰ IPCC, *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, chapter 4. <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>



12 Action plans

Many energy and greenhouse programs require participants to develop an action plan (or a variation thereof). This chapter outlines how action plans relate to energy audits, energy savings and greenhouse gas reductions and standard reporting fields. Programs will not require all reporting fields listed in this chapter. Program managers and designers should carefully consider whether the reporting field is needed to meet the objectives of the program.

Reference is made to the action plan reporting fields (Figure 12.1 on page 52) throughout this chapter. The reporting fields included within the template will be incorporated into the online reporting tool. The template is provided to assist in streamlining reporting fields only and is not representative of the final layout and complete functionality that will be provided in the online reporting tool.

12.1 Definition of action plan

An action plan details the energy savings and greenhouse gas reduction actions that program participants intend to implement. It includes cost and timeframes for implementing actions. An action plan may also facilitate the documentation of achieved energy savings and greenhouse gas reductions for the purposes of comparison with projected energy savings and greenhouse gas reductions. The action plan forms the core reporting format for many of the existing programs under consideration. Action plans include audit results, details of the actions identified, progress on actions, and energy savings and greenhouse gas reductions already made.

In the context of this Protocol, the definition of ‘actions’ within the action plan is interchangeable with the definition of ‘opportunities’ under EEO and ‘measures’ under Queensland’s Smart Energy Savings Program.

12.2 Online reporting tool (OSCAR)

The remit of this Protocol is not to describe the proposed functionality of OSCAR. Nevertheless, the following aspects of OSCAR functionality are clarified here for the purposes of the Protocol:

- > Mandatory and voluntary fields for each program will be highlighted in OSCAR in order to assist program participants to complete their reporting using OSCAR.
- > OSCAR has the functionality to convert energy savings provided in most other units to GJ.
- > OSCAR will be able to record past action plans to provide a record of actions previously completed and when the audits or assessments were undertaken. This record will allow program managers and participants to see the measurement methodologies and emission factors used to establish baseline data and energy savings and greenhouse gas reductions, as well as providing participants with the opportunity to update actions.

12.3 Reporting fields for greenhouse and energy action plans

This section outlines standard reporting fields for action plans. The list includes mandatory and voluntary reporting fields. New programs should be designed around the same action plan reporting fields to avoid additional reporting burden on business.

Figure 12.1 is referred to throughout this section and documents all the proposed reporting fields, however, it is intended that the configured online reporting tool will display only those fields relevant to a program participant.

The required reporting fields for each action will depend on the type of action. Management and process change actions (categories a) to e) in the Action Category section below) may be difficult to quantify and will not require quantitative data to be entered into the action plan.

Action Description

A qualitative description of the action identified is an important element of an action plan. The description may include the physical location where the energy saving and / or greenhouse gas reduction occurred, the equipment type by EEO category (relevant to EEO participants only) and the accuracy range (EEO only). Program managers can provide guidance to participants on the items that should be included in the qualitative description to satisfy their program requirements.

Action Category

Programs request that participants categorise actions identified to aid follow up of those actions and assist in establishing the types of actions that lead to the greatest energy savings and / or greenhouse gas reductions. For example:

- a) Changes in staff operation of equipment;
- b) Changes in management practices;
- c) Changes in management systems e.g., procurement, policy, KPIs;
- d) Improvement in energy measurement and monitoring;
- e) Improvement in process control e.g., use of higher quality production inputs;
- f) Investment in the same but more efficient technologies;
- g) Investment in new technologies or new configurations of technologies not used before; and
- h) Investment in research and development, testing and trialling.

Source

The source field can either be a fuel type or a greenhouse gas emissions source, as defined in the NGER Regulations and the NGER (Measurement) Determination. One action may result in forecast energy savings or greenhouse gas reductions from a number of different fuel types or emissions sources.

Program managers and designers may require entities to report forecast savings and reductions for each of the different sources for an action. Reporting by source will assist programs to verify projected savings and reductions. Entities should be able to choose whether they report energy savings and greenhouse gas reductions per source or just per action.

The fuel type and emissions sources will be categorised according to the NGER (Measurement) Determination.¹¹

Status

The status field records progress on actions. The status field provides the opportunity for participants and program managers to track the progress of implementation, which is particularly important for programs that require mandatory implementation.

Start Date & Completion Date

Programs may require entities to provide a timeframe for implementing actions in the action plan. Timeframes are to be reported in the form of separate start and completion dates.

Responsibility

Name of the person or job position responsible for the implementation of an action.

¹¹ See Section 4.2 for further discussion on the NGER Act sources

Implementation Cost

Implementation or project costs are defined as the cost to implement the project. This may be a one off cost of capital assets or costs relating to labour or the shutdown of a plant and/or equipment. Costs are to be reported in AUD. Recurring costs will need to be entered in the same format as energy savings, i.e. AUD/year.

Projected Energy Savings

Projected energy savings are to be reported per action, or at a higher level of aggregation across an entity or organisation (depending on the program requirements) with the option to report by source (i.e., either fuel type or greenhouse gas emissions source). Energy savings are generally reported in GJ and, if required by the program, in AUD per annum. If reporting energy savings is in AUD, in conjunction with cost to implement, the participant will be able to calculate the payback period. Reporting of projected energy savings is to be accompanied by a description of the calculation method. The aim of this description is to provide transparency in reporting and enable comparison with achieved energy savings by ensuring the calculation method remains the same for both projected and achieved energy savings.

Peak Demand Savings

There will be an option to report summer and winter peak demand savings for electricity (kWhr).

Other Savings (net)

Ongoing or recurrent management or maintenance action requiring continuing investment over the lifetime of the action. Other savings should be reported in AUD per annum.

Payback Period

The payback period for an action is defined as the period (expressed in years) calculated in accordance with the formula:

$$> \text{Payback} = A/B$$

Where A is an amount equal to the initial capital cost of implementation; and B is equal to the net annual savings, not including any amount that is included within A.

The payback period for an action should also allow for quantification of wider benefits for the entity. Many of these wider benefits and costs can be quantified. For example, the use of resources other than energy (water, consumables, waste treatment, labour) will often be reduced with the implementation of an action. Conversely, there can also be areas of increased costs.

Internal Rate of Return

The internal rate of return is the savings (expressed as an interest rate) received for an action based on the costs and savings yearly, over a defined timeframe. It can be compared with the interest rate from investing the capital in an alternative instrument (e.g. bank or shares).

Projected Greenhouse Gas Reductions

Projected reductions are to be provided in t CO₂-e per annum. See section 11.5 for guidance on calculating and reporting greenhouse gas reductions.

Monitoring Process

Some programs may require participants to include a qualitative description of the monitoring process for implementing the action plan. The online reporting tool will include the opportunity to report the proposed monitoring process for the action plan. This will be a general description as opposed to a detailed description of the monitoring process for each action.

Achieved Energy Savings

See section 11.3 on energy savings for guidance on reporting achieved energy savings.


Achieved Greenhouse Gas Reductions

Greenhouse gas reductions achieved should be provided in t CO₂-e by action and by Kyoto gas. See section 11.5 for guidance on achieved greenhouse gas reduction reporting requirements.

Figure 12.1 Action plan reporting fields (showing proposed reporting fields, not functionality)

Action Plan		drop down list based on EEO list		drop down list		drop down list categories to be determined		Qualitative description, should cover the monitoring method for all actions											
Action	Action category	Action Description	Source	Status	Start Date	Completion Date	Responsibility	Implementation Cost (AUD)	Projected Savings and Reductions										
									Energy Savings		GHG emission reductions (tCO2-e)	Calculation Method	Other savings (AUD)	Payback Period (years)	Monitoring Method				
Peak Demand Savings		GJ	AUD	winter	summer														
1					source 1														
2			source 2																
3																			
4																			
5																			
Total																			

Achieved Savings and Reductions		drop down list categories to be determined		drop down list categories to be determined		drop down list categories to be determined		Qualitative description, should cover the monitoring method for all actions		
Action	GJ	Energy Savings		GHG emission reductions (tCO2-e)	Calculation Method	Other savings	Difference in projected and achieved energy savings (GJ)	Reason for difference	Difference in projected and achieved GHG emissions reductions (tCO2-e)	Reason for difference
		Peak Demand Savings								
		winter	summer							
1										
2										
3										
4										
5										
Total										



13 Energy and greenhouse gas emissions projections

This chapter explains how programs should approach the collection of corporate energy and greenhouse gas emissions projections data.

13.1 Definition of projections

Energy projections are an estimate or forecast of the amount of energy a company expects to produce or consume over a specified future time period.

Greenhouse gas emissions projections are an estimate or forecast of the greenhouse gas emissions a company expects to emit over a specified future time period.

13.2 Use of energy and greenhouse gas emissions projections


Under some greenhouse and energy programs entities provide projections data for use in energy and greenhouse management planning, target setting and government policy development.

A number of issues can arise in the quality and usability of this data due to its inherent level of uncertainty. The accuracy of projected data generally declines, as the time period to which the projection applies stretches further into the future. This is because company structures and activities frequently change over time as a result of a vast range of social, environmental and economic factors, which can be difficult to predict. In response to these factors a company may install new equipment, increase or decrease its level of production and change staff numbers, which will in turn affect the amount of greenhouse gas emissions released or energy produced or consumed. Predicted changes must be considered when undertaking projections calculations and this renders them difficult to calculate to a standard that facilitates confident use.

13.3 Standard approach

As a result of these issues, the Australian, state and territory governments have agreed that company or facility level projections of energy consumption or production or greenhouse gas emissions will not be required to be reported as part of greenhouse and energy reporting programs. However, entities may choose to voluntarily report their projections through the online system.

If entities do elect to report projections data, energy and greenhouse gas emissions estimation methodologies should be consistent with their inventory report methodology as per the NGER (Measurement) Determination 2008.



Glossary

Action	Refers to energy savings and greenhouse gas reduction actions.
Action Plan	A document detailing the energy savings and greenhouse gas reduction actions that program participants intend to implement. Action plans include audit results, details of actions identified, cost and timeframe for implementation, progress on actions and projected and achieved energy savings and greenhouse gas reductions.
Activity	An organisational unit used to determine the boundaries of a facility.
ANZSIC industry classification and code	An industry classification and code for that classification published in the Australian and New Zealand Standard Industrial Classification (ANZSIC) 2006.
ANZSIC division	A division identified by an alpha character published in the Australian and New Zealand Standard Industrial Classification, 2006.
Business activity indicator	Used in the Energy Savings Action Plans Program in NSW and means the same as 'Intensity Indicator' for the purposes of the Protocol.
Business metric	Units of physical activity or units of output that are representative of business operations.
Business unit	A unit that is recognised by an entity as having administrative responsibility for one or more facilities of the corporation.
Carbon dioxide equivalent	A standard measure (expressed as CO ₂ -e) that takes account of the different global warming potential of different greenhouse gases and expresses the cumulative effect in a common unit.

Controlling corporation	A constitutional corporation that does not have a holding company in Australia; it is generally the corporation at the top of the corporate hierarchy in Australia. Foreign corporations may also be controlling corporations.
Constitutional corporation	Under paragraph 51(xx) of the Australian Constitution, the Australian Parliament has power to make laws with respect to foreign corporations and trading or financial corporations formed within the limits of the Australian Government. These corporations are known as ‘constitutional corporations’.
Direct emissions	see ‘scope 1 emissions’
Emissions	The release of greenhouse gases into the atmosphere.
Energy audit	Inspection, survey and analysis of energy flows in a building, process or system with the objective of understanding the energy dynamics of the system under study and identifying opportunities for reducing energy consumption.
Energy assessment	See ‘Energy Audit’
Energy efficiency indicator	Used in the Smart Energy Savings Program in QLD – means the same as ‘Intensity Indicator’ for the purposes of the Protocol.
Energy consumption	The use or disposal of energy from the operation of the facility including own-use and losses in extraction, production and transmission.
Energy production	The extraction or capture of energy from natural sources for final consumption by or from the operation of a facility or for use other than in operation of the facility; or the manufacture of energy by the conversion of energy from one form to another form for final consumption by or from the operation of the facility or for use other than in the operation of the facility.
Energy savings	The achieved reduction in energy consumption relative to baseline energy consumption as a result of implementation of specific actions detailed in an action plan.
Fugitive emissions	Greenhouse gases that are released in the course of oil and gas extraction and processing, through leaks from gas pipelines, and as waste methane from black coal mining.
Global warming potential	A measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale that compares a gas with the same mass of carbon dioxide and is calculated over a specific time interval. For example, over the next 100 years, a gram of methane in the atmosphere is currently estimated as having 21 times the warming effect as a gram of carbon dioxide; methane’s 100-year global warming potential is thus 21.

Greenhouse gases	Six Kyoto Protocol classes of gases (methane, carbon dioxide, nitrous oxide, Sulphur hexafluoride, hydrofluorocarbons, perfluorocarbons).
Greenhouse Gas Reductions	A decrease in emission of gases responsible for causing global warming from the atmosphere relative to baseline emissions.
Incidental greenhouse gas emissions and energy	Small sources of greenhouse gas emissions or energy at a facility.
Industry sector	A method of attributing business activities to sectors. Industry sectors are based on the ANZSIC industry classification.
Industrial processes	Procedures involving chemical or mechanical steps to aid in the manufacture of an item or items, usually carried out on a large scale. Greenhouse gas emissions from industrial processes are primarily by-products of production, and they vary with the process technology used and the level of industrial output. These emissions arise from non-energy related sources. For example, high temperature processing of calcium carbonate to produce quicklime releases carbon dioxide emissions.
Intensity indicator	An intensity indicator shows an entity's normalised greenhouse gas emissions or energy use divided by a selected business metric. Intensity indicators are also often referred to as efficiency indicators or business activity indicators in some programs.
Materiality	The material impact of greenhouse gas emissions measurements on the overall greenhouse gas emissions inventory of a facility or corporation. The materiality concept is often used in financial reporting.
Measures	see 'action'.
Oil or gas extraction activities	An activity involving extraction of, or exploration for, oil or gas; the operation of a liquefied natural gas floating platform; or the transportation of oil or gas, but only to the extent that that transportation is through a pipeline.
Online System for Comprehensive Activity Reporting (OSCAR)	An online reporting tool developed by the Australian Government for greenhouse and energy reporting.
Opportunities	see 'action'.

Operational control	A corporation is considered to have operational control over a facility if the member has authority to <i>introduce</i> and <i>implement</i> operating, health and safety, and environmental policies. Only one corporation can have operational control over a facility at any time.
Performance indicators	Established by programs to measure whether the program is meeting its objectives. There are two key types of comparative performance indicators: efficiency and effectiveness.
Projections	Energy projections are an estimate or forecast of the amount of energy a company expects to produce or consume over a specified future time period. Greenhouse gas emissions projections are an estimate or forecast of the greenhouse gas emissions a company expects to emit over a specified future time period.
Resource efficiency indicator	Used in the Environment and Resource Efficiency Program in Victoria – means the same as ‘Intensity Indicator’ for the purposes of the Protocol.
Scope 1 emissions	Greenhouse gas emissions which occur as a direct result of activities at a facility and are also referred to as direct emissions.
Scope 2 emissions	Greenhouse gas emissions from the generation of purchased electricity, steam, heating or cooling consumed by a facility and are also referred to as indirect emissions.
Scope 3 emissions	Greenhouse gas emissions (other than scope 2 emissions) that are generated in the wider economy as a consequence of a facility’s activities but that are physically produced by another facility.
Source	A source of greenhouse gas emissions.
Subsidiary	A ‘subsidiary’ has the same meaning as that expressed in section 46 of the <i>Corporations Act 2001</i> . Any subsidiary under the Corporations Act would be considered part of the controlling corporation’s group.
Sub-facility	Organisational units that make up a facility.
Transport facility	A facility within air and space transport; postal and courier pick-up and delivery services; freight and passenger transport for rail, road and water; scenic and sightseeing transport; and waste collection services sectors.
Value add	the wealth created by a company calculated by the amount of earnings less the cost of consumed goods and services.

Appendix A

Greenhouse gases that must be reported under the NGER Act

Gas	Chemical formula
Carbon dioxide	CO ₂
HFC-125	C ₂ H ₂ F ₅
HFC-134	C ₂ H ₂ F ₄ (CHF ₂ CHF ₂)
HFC-134a	C ₂ H ₂ F ₄ (CH ₂ FCF ₃)
HFC-143	C ₂ H ₃ F ₃ (CHF ₂ CH ₂ F)
HFC-143a	C ₂ H ₃ F ₃ (CF ₃ CH ₃)
HFC-152a	C ₂ H ₄ F ₂ (CH ₃ CHF ₂)
HFC-227ea	C ₃ HF ₇
HFC-23	CHF ₃
HFC-236fa	C ₃ H ₂ F ₆
HFC-245ca	C ₃ H ₃ F ₅
HFC-32	CH ₂ F ₂
HFC-41	CH ₃ F
HFC-43-10mee	C ₅ H ₂ F ₁₀
Methane	CH ₄
Nitrous oxide	N ₂ O
Perfluorobutane	C ₄ F ₁₀
Perfluorocyclobutane	c-C ₄ F ₈
Perfluoroethane (hexafluoroethane)	C ₂ F ₆
Perfluorohexane	C ₆ F ₁₄
Perfluoromethane (tetrafluoromethane)	CF ₄
Perfluoropentane	C ₅ F ₁₂
Perfluoropropane	C ₃ F ₈
Sulphur hexafluoride	SF ₆

Appendix B

Possible greenhouse gas emissions sources from different types of activities: examples

ANZSIC no.	ANZSIC category	Stationary energy	Transport	Fugitives	Industrial processes*	Waste
26	Electricity	x	•		•	
1701	Petroleum refining	x	•	x	•	
06	Coal mining	x	•	x	•	
07	Oil and gas extraction	x	•	x	•	
27	Gas supply	x	•	x	•	
211	Iron and steel manufacturing	x	•		x	
213	Basic non-ferrous metal manufacturing	x	•		x	
	Petroleum and coal products nec	x	•		x	
18	Basic chemical manufacturing	x	•		x	x
14, 15	Pulp, paper and print	x	•		•	x
11, 12	Food, beverages, tobacco manufacturing	x	•		x	x
08, 09, 10	All other mining	x	•		x	
201	Glass and glass product manufacturing	x	•		x	
202	Ceramic product manufacturing	x	•		x	
203	Cement, lime, plaster and concrete product manufacturing	x	•		x	
209	Non-metallic mineral product manufacturing	x	•		x	

ANZSIC no.	ANZSIC category	Stationary energy	Transport	Fugitives	Industrial processes*	Waste
13	Textile, clothing, footwear and leather manufacturing	x	•		•	
212	Other metal manufacturing	x	•		•	
214	Machinery and equipment manufacturing	x	•		•	
Div E	Construction	x	•		•	
Div F-S	Services	x	•		x	
Div A	Agriculture, forestry, fishing	x	•		•	
65-67		x	x		x	

* Not elsewhere classified.

x Likely to be a major source of greenhouse gas emissions.

• Likely to be a minor source of greenhouse gas emissions.

Appendix C

Reportable fuels and energy commodities – (from Schedule 1 of the NGER Regulations)

Item	Fuels and other energy commodities
<i>Solid fossil fuels and coal based products</i>	
1	Black coal (other than that used to produce coke)
2	Brown coal
3	Coking coal
4	Brown coal briquettes
5	Coke oven coke
6	Coal tar
7	Solid fossil fuels other than those mentioned in items 1 to 5
<i>Fuels derived from recycled materials</i>	
8	Industrial materials and tyres that are derived from fossil fuels, if recycled and combusted to produce heat or electricity
9	Non-biomass municipal materials, if recycled and combusted to produce heat or electricity
<i>Primary solid biomass fuels</i>	
10	Dry wood
11	Green and air dried wood
12	Sulphite lyes
13	Bagasse
14	Biomass municipal and industrial materials, if recycled and combusted to produce heat or electricity
15	Charcoal
16	Primary solid biomass fuels other than those mentioned in items 10 to 15
<i>Gaseous fossil fuels</i>	
17	Natural gas if distributed in a pipeline
18	Coal seam methane that is captured for combustion
19	Coal mine waste gas that is captured for combustion
20	Compressed natural gas
21	Unprocessed natural gas
22	Ethane
23	Coke oven gas

Item	Fuels and other energy commodities
24	Blast furnace gas
25	Town gas
26	Liquefied natural gas
27	Gaseous fossil fuels other than those mentioned in items 17 to 26
<i>Biogas captured for combustion</i>	
28	Landfill biogas that is captured for combustion
29	Sludge biogas that is captured for combustion
30	A biogas that is captured for combustion, other than those mentioned in items 28 to 29
<i>Petroleum based oils and petroleum based greases</i>	
31	Petroleum based oils (other than petroleum based oils used as fuel)
32	Petroleum based greases
<i>Petroleum based products other than petroleum based oils and petroleum based greases</i>	
33	Crude oil including crude oil condensates
34	Other natural gas liquids
35	Gasoline (other than for use as fuel in an aircraft)
36	Gasoline for use as fuel in an aircraft
37	Kerosene (other than for use as fuel in an aircraft)
38	Kerosene for use as fuel in an aircraft
39	Heating oil
40	Diesel oil
41	Fuel oil
42	Liquefied aromatic hydrocarbons
43	Solvents if mineral turpentine or white spirits
44	Liquefied petroleum gas
45	Naphtha
46	Petroleum coke
47	Refinery gas and liquids
48	Refinery coke
49	Bitumen
50	Waxes

Item	Fuels and other energy commodities
51	Petroleum based products other than: (a) petroleum based oils and petroleum based greases mentioned in items 31 to 32 (b) petroleum based products mentioned in items 33 to 50
<i>Biofuels</i>	
52	Biodiesel
53	Ethanol for use as a fuel in an internal combustion engine
54	Biofuels other than those mentioned in items 52 to 53
<i>Petrochemical feedstock</i>	
55	Carbon black if used as a petrochemical feedstock
56	Ethylene if used as a petrochemical feedstock
57	Petrochemical feedstock other than those mentioned in items 55 to 56
<i>Energy commodities</i>	
58	Sulphur
59	Solar energy for electricity generation
60	Wind energy for electricity generation
61	Water energy for electricity generation
62	Geothermal energy for electricity generation
63	Uranium
64	Hydrogen
65	Electricity
66	Energy commodities other than those mentioned in items 58 to 65 and in the form of steam, compressed air or waste gas acquired either to produce heat or for another purpose

Appendix D

ANZSIC industry sectors – Schedule 2 from the NGER Regulations

ANZSIC code	ANZSIC industry classification
2006	
<i>Division A</i>	<i>Agriculture, forestry and fishing</i>
01	Agriculture
02	Aquaculture
03	Forestry and logging
04	Fishing, hunting and trapping
05	Agriculture, forestry and fishing support services
<i>Division B</i>	<i>Mining</i>
060	Coal mining
070	Oil and gas extraction
080	Metal ore mining
091	Construction material mining
099	Other non-metallic mineral mining and quarrying
101	Exploration
109	Other mining support services
<i>Division C</i>	<i>Manufacturing</i>
111	Meat and meat product manufacturing
112	Seafood processing
113	Dairy product manufacturing
114	Fruit and vegetable processing
115	Oil and fat manufacturing
116	Grain mill and cereal product manufacturing
117	Bakery product manufacturing
118	Sugar confectionary manufacturing
119	Other food product manufacturing
121	Beverage manufacturing
122	Cigarette and tobacco product manufacturing
131	Textile manufacturing
132	Leather tanning, fur dressing, and leather product manufacturing
133	Textile product manufacturing

ANZSIC code 2006	ANZSIC industry classification
134	Knitted product manufacturing
135	Clothing and footwear manufacturing
141	Log sawmilling and timber dressing
149	Other wood product manufacturing
151	Pulp, paper and paperboard manufacturing
152	Converted paper product manufacturing
161	Printing and printing support services
162	Reproduction of recorded media
170	Petroleum and coal product manufacturing
181	Basic chemical manufacturing
182	Basic polymer manufacturing
183	Fertiliser and pesticide manufacturing
184	Pharmaceutical and medicinal product manufacturing
185	Cleaning compound and toiletry preparation manufacturing
189	Other basic chemical product manufacturing
191	Polymer product manufacturing
192	Natural rubber product manufacturing
201	Glass and glass product manufacturing
202	Ceramic product manufacturing
203	Cement, lime, plaster and concrete product manufacturing

ANZSIC code 2006	ANZSIC industry classification
209	Other non-metallic mineral product manufacturing
211	Basic ferrous metal manufacturing
212	Basic ferrous product manufacturing
213	Basic non-ferrous metal manufacturing
214	Basic non-ferrous metal product manufacturing
221	Iron and steel forging
222	Structural product manufacturing
223	Metal container manufacturing
224	Sheet metal product manufacturing (except metal structural and container products)
229	Other fabricated metal product manufacturing
231	Motor vehicle and motor vehicle part manufacturing
239	Other transport equipment manufacturing
241	Professional and scientific equipment manufacturing
242	Computer and electronic equipment manufacturing
243	Electrical equipment manufacturing
244	Domestic appliance manufacturing
245	Pump, compressor, heating and ventilation equipment manufacturing
246	Specialised machinery and equipment manufacturing
249	Other machinery and equipment manufacturing
251	Furniture manufacturing
259	Other manufacturing
<i>Division D</i>	<i>Electricity, gas, water and waste services</i>
261	Electricity generation
262	Electricity transmission
263	Electricity distribution
264	On-selling electricity and electricity market operation
270	Gas supply
281	Water supply, sewerage and drainage services
291	Waste collection services
292	Waste treatment, disposal and remediation services

ANZSIC code 2006	ANZSIC industry classification
<i>Division E</i>	<i>Construction</i>
301	Residential building construction
302	Non-residential building construction
310	Heavy and civil engineering construction
32	Construction services
<i>Division F</i>	<i>Wholesale trade</i>
331	Agricultural product wholesaling
332	Mineral, metal and chemical wholesaling
333	Timber and hardware goods wholesaling
341	Specialised industrial machinery and equipment wholesaling
349	Other machinery and equipment wholesaling
350	Motor vehicle and motor vehicle parts wholesaling
360	Grocery, liquor and tobacco product wholesaling
371	Textile, clothing and footwear wholesaling
372	Pharmaceutical and toiletry goods wholesaling
373	Furniture, floor covering and other goods wholesaling
380	Commission-based wholesaling
<i>Division G</i>	<i>Retail trade</i>
391	Motor vehicle retailing
392	Motor vehicle parts and tyre retailing
400	Fuel retailing
411	Supermarket and grocery stores
412	Specialised food retailing
421	Furniture, floor coverings, houseware and textile goods retailing
422	Electrical and electronic goods retailing
423	Hardware, building and garden supplies retailing
424	Recreational goods retailing
425	Clothing, footwear and personal accessory retailing
426	Department stores
427	Pharmaceutical and other store-based retailing
431	Non-store retailing
432	Retail commission-based buying and/or selling

ANZSIC code 2006	ANZSIC industry classification
<i>Division H</i>	<i>Accommodation and food services</i>
440	Accommodation
451	Cafes, restaurants and takeaway food services
452	Pubs, taverns and bars
453	Clubs (hospitality)
<i>Division I</i>	<i>Transport, postal and warehousing</i>
461	Road freight transport
462	Road passenger transport
471	Rail freight transport
472	Rail passenger transport
481	Water freight transport
482	Water passenger transport
490	Air and space transport
501	Scenic and sightseeing transport
502	Pipeline and other transport
510	Postal and courier pick-up and delivery services
521	Water transport support services
522	Airport operations and other air transport support services
529	Other transport support services
530	Warehousing and storage services
<i>Division J</i>	<i>Information media and telecommunications</i>
541	Newspaper, periodical, book and directory publishing
542	Software publishing
55	Motion picture and sound recording activities
561	Radio broadcasting
562	Television broadcasting
570	Internet publishing and broadcasting
580	Telecommunications services
591	Internet service providers and web search portals
592	Data processing, web hosting and electronic information storage services
601	Libraries and archives
602	Other information services

ANZSIC code 2006	ANZSIC industry classification
<i>Division K</i>	<i>Financial and insurance services</i>
621	Central banking
622	Depository financial intermediation
623	Non-depository financing
624	Financial asset investing
63	Insurance and superannuation funds
641	Auxiliary finance and investment services
642	Auxiliary insurance services
<i>Division L</i>	<i>Rental, hiring and real estate services</i>
661	Motor vehicle and transport equipment rental and hiring
662	Farm animal and bloodstock leasing
663	Other goods and equipment rental and hiring
664	Non-financial intangible assets (except copyrights) leasing
671	Property operators
672	Real estate services
<i>Division M</i>	<i>Professional, scientific and technical services</i>
691	Scientific research services
692	Architectural, engineering and technical services
693	Legal and accounting services
694	Advertising services
695	Market research and statistical services
696	Management and related consulting services
697	Veterinary services
699	Other professional, scientific and technical services
700	Computer system design and related services
<i>Division N</i>	<i>Administrative and support services</i>
721	Employment services
722	Travel agency and tour arrangement services
729	Other administrative services
731	Building cleaning, pest control and gardening services
732	Packaging services

ANZSIC code 2006	ANZSIC industry classification
<i>Division O</i>	<i>Public administration and safety</i>
751	Central government administration
752	State government administration
753	Local government administration
754	Justice
755	Government representation
760	Defence
771	Public order and safety services
772	Regulatory services
<i>Division P</i>	<i>Education and training</i>
80	Preschool and school education
810	Tertiary education
821	Adult, community and other education
822	Educational support services
<i>Division Q</i>	<i>Health care and social assistance</i>
840	Hospitals
85	Medical and other health care services
860	Residential care services
871	Child care services
879	Other social assistance services
<i>Division R</i>	<i>Arts and recreation services</i>
891	Museum operation
892	Parks and gardens operations
900	Creative and performing arts activities
911	Sports and physical recreation activities
912	Horse and dog racing activities
913	Amusement and other recreation activities
920	Gambling activities

ANZSIC code 2006	ANZSIC industry classification
<i>Division S</i>	<i>Other services</i>
941	Automotive repair and maintenance
942	Machinery and equipment repair and maintenance
949	Other repair and maintenance
951	Personal care services
952	Funeral, crematorium and cemetery services
953	Other personal services
954	Religious services
955	Civic, professional and other interest group services
96	Private households employing staff and undifferentiated goods-and-service-producing activities of households for own use

Note: Divisions do not constitute industry sectors. They are used here simply as a means of separating industry sectors for convenience.

Appendix E

Sector Specific Intensity Indicators

Iron and Steel

There are considerable differences in the energy intensity of primary steel production between individual plants or facilities. These differences can be explained by factors such as the level of waste energy recovery, the quality of iron ore, operational skills and quality control. Standard business metrics for this sector are:

- > Tonne of crude steel produced;
- > Tonne of blast furnace/basic oxygen furnace steel produced;
- > Tonne of direct reduced iron;
- > Tonne of pig iron with a maximum carbon content of 6 per cent; and
- > Tonne of electric arc furnace steel.

Cement

The IEA suggests the production of cement, with its well defined system boundaries and a uniform product, is well suited to standard indicator development. The numerator is commonly disaggregated into process, thermal and indirect electrical and can be used with any of the following denominators. Standard metrics for this sector are:

- > Tonne of clinker;
- > Tonne of cement; and
- > Tonne of cementitious material.

Pulp and Paper

The IEA recommends energy and greenhouse gas emission indicators be developed for each main paper and pulp product category. The following list combines product categories developed jointly by the Australian Bureau of Statistics (ABS) and Statistics New Zealand and those recommended for use by the IEA. Standard business metrics for this sector are:

- > Tonne of chemical pulping;
- > Tonne of mechanical pulping;
- > Tonne of paper produced;
- > Tonne of paper recycled;
- > Tonne of paperboard manufactured;
- > Tonne of wood pulp manufactured;
- > Tonne of paper bags manufactured;
- > Tonne of paper stationary manufactured; and
- > Tonne of sanitary paper product manufactured.

Chemicals and Petrochemicals

Indicators for chemicals and petrochemicals are different from other sectors because energy can be used as feedstock as well as being embodied. For this reason business metrics should be developed at the level of individual processes and products. Generally, metrics should be based on product tonnes or product kilolitres. The following list is drawn from the EITE Activity Definitions and provides examples of business metrics for selected chemicals.

Chlorine gas and sodium hydroxide

Tonnes of 100 per cent equivalent dry weight sodium hydroxide which is not recycled back into the activity.

Production of carbon black

Tonnes of dry pelletised carbon black where carbon black is defined as a colloidal carbon material in the form of spheres and of their fused aggregates, with sizes below 1000nm which is produced as on-specification product.

Methanol

Tonnes of methanol (energy consumption and emissions resulting from production of oxygen for use as feedstock should be included within the boundary).

Magnesia Production

Tonnes dry weight basis of:

- > caustic calcined magnesia where the magnesia has a minimum magnesium oxide mass content of 75 per cent and burning has occurred between 650°C and 1200°C;
- > deadburned magnesia where the magnesia has a minimum magnesium oxide mass content of 85 per cent, grain density of 3.00g.cm⁻³ to 3.45g.cm⁻³ and burned between 1450°C and 2200°C; or
- > electrofused magnesia where the magnesia has a minimum magnesium oxide mass content of 90 per cent, grain density greater than 3.45g.cm⁻³ and is fused at temperatures in excess of 2750°C.

Silicon

Tonnes of silicon with a purity equal to 98 per cent produced.

Aluminium

Aluminium production can be split into primary aluminium production and recycling. Primary production is approximately 20 times as energy intensive as recycling and represents the bulk of energy consumption. The standard business metric to be used is tonnes of primary aluminium with a purity of equal to or greater than 98 per cent. For fused alumina production, the standard metric is tonnes of fused alumina with an alpha alumina crystalline structure and purity equal to or greater than 99 per cent.

Zinc Smelting

The standard business metric for zinc smelting is product tonnes of zinc metal with a purity of equal to or greater than 99.95 per cent.

Titanium production

The following standard business metrics for production of synthetic rutile and titanium dioxide are drawn from the EITE Activity Definitions:

- > Tonnes of synthetic rutile produced from iron titanium oxide; and
- > Tonnes of white titanium dioxide pigment conforming to the ASTM classification D476-00.

Glass

The following standard business metrics for glass production are drawn from the EITE Activity Definitions:

- > Tonnes of bulk flat glass produced: and
- > Tonnes of blown and pressed glass containers produced.

Food and Beverage

The generic business metrics that should be applied for the food and beverage sector are production mass or production volume. In some instances, it may be useful to apply input mass or volumes. Some examples are as follows:

- > Kilolitres of product (e.g., milk, finished beverage);
- > Tonnes / Kilograms product (e.g., malt, bread, chocolate, yeast);
- > Kilolitres of input per year (e.g., milk processed);
- > Tonnes / Kilograms input (e.g., seed processed, raw sugar melt, eggs processed); and
- > Input numbers (e.g., chickens processed).

Services

The service sector includes activities related to trade, finance, real estate, public administration, health, education and commercial services. Measuring intensity in this sector ideally requires detailed data by end-use (heating, cooling, lighting, etc) but this level of disaggregated data is generally costly for entities to collect. Tailoring the generic list of business metrics to suit the specific service is likely to be more suitable for the majority of entities in this sector due to the diversity of services provided.

Health and hospitality

With regard specifically to the hospitality and health care sub-sectors, number of bed nights is the standard business metric to be used.

Finance

With regard to the finance sector standard business metrics are AUD Net operating income and AUD cash earnings.