final report

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Prepared by: Energetics Pty Ltd

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Meat and Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

NGER Reporting Guidelines for the Meat and Livestock Industry in Australia

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Content

1 Introduction

1.1 What is the National Greenhouse and Energy Reporting Scheme?

The *National Greenhouse and Energy Reporting Act 2007* (NGER Act) establishes a national framework for corporations to report greenhouse gas (GHG) emissions and energy consumption and production from 1 July 2008. The NGER Act makes registration and reporting mandatory for corporations whose energy production, energy use or GHG emissions meet specified NGER thresholds.

The purpose of the NGER Scheme is to provide for the reporting and dissemination of information related to greenhouse gas emissions, greenhouse gas projects, energy production and consumption. Information collected by the Scheme will be used to inform Australia's energy policy and management, international reporting requirements and as a precursor to establishing an Australian emissions trading scheme (known as the Carbon Pollution Reduction Scheme (CPRS).

The first year of reporting for NGER was the 2008/09 financial year and corporations or facilities that met or exceeded energy or greenhouse gas emissions thresholds needed to register with the Department of Climate Change (DCC) and submit their NGER report in October 2009.

The thresholds which trigger the reporting obligation become progressively lower each year so that the reporting scheme covers more of Australia's emissions over time. In the first year of NGER reporting, over 600 companies were required to report to the Government but as the threshold reduces, the number of companies obligated to report will increase substantially. A number of companies within the meat and livestock industry have mandatory reporting requirements under the National Greenhouse and Energy Reporting (NGER) Act, 2007. Over the next two years, the number of companies required to report under the NGER scheme will increase as reporting thresholds decrease.

1.2 Purpose of this Guidebook

Meat and Livestock Australia (MLA) has commissioned the development of this NGER Guidebook to assist the meat processing industry with NGER reporting.

Some MLA members that were required to report in the first 2008/2009 reporting year, have assisted in the preparation of this guidebook by volunteering their experiences of NGER reporting. In preparing for this Guidebook, site visits were conducted and those involved in the data collection and reporting process were interviewed.

By capturing and building on the experience of other companies in the industry, the Guidebook intends to simplify and streamline the reporting processes and focus on real issues that are relevant to the meat and livestock industry. This will be particularly useful to small and medium sized companies that may not have the data management, reporting systems and resources of larger companies.

The Guidebook has been written to provide background and technical information to enable companies to determine:

- Whether they need to report under NGER;
- What data needs to be reported;
- The methodology for gathering data and quantifying greenhouse gas emissions;
- What systems and processes need to be in place for compliance; and
- The reporting and lodgement process.

1.3 Structure of the Guidebook

The Guidebook outlines the NGER Reporting process in the context of the meat and livestock industry. General information is provided in addition to commentary based on experience from MLA members involved in the preparation of this Guidebook.
Throughout the Guidebook, key concepts have been highlighted in boxes.

Key Concepts
These are items that have been highlighted for attention. Information contained in these boxes relates to definitions, specific applications, tips for the meat processing industry and experience from sites involved in the preparation of this Guidebook.

To demonstrate the practical application of NGER concepts, the Guidebook also provides worked examples in boxes.

Worked Examples
A fictional company within the meat and livestock industry has been created to work through examples of the NGER reporting process. Although examples are fictional, they are based on real experiences and issues faced by MLA members in the first reporting year. Examples are designed to assist companies integrate NGER reporting into their existing systems and processes.

2 Getting Started

2.1 Other Environmental Reporting Schemes

Many MLA members will have experience in other mandatory and voluntary reporting programs such as Greenhouse Challenge Plus, the Energy Efficiency Opportunities program and the National Pollutant Inventory.

Information from MLA members that undertook NGER reporting last year indicated that some of these programs provided a good grounding for understanding corporate structure and registration, emissions sources and managing energy and emission data. Where information was already complied for these programs, companies were confident in these datasets.

In general, MLA members that were required to report in the first reporting year were large companies with many having the benefit of audit quality systems and varying degrees of environmental management systems. Some have started to integrate the necessary tasks associated with NGER into these or into an overarching Integrated Management System.

2.2 NGER Legislation

2.2.1 What is the NGER Legislation?

This guidebook has been written for use in conjunction with the NGER legislation and should be viewed as a starting point and overview of the reporting requirements and process. The NGER documentation is a significant body of literature and should be the ultimate reference for reporting. Those responsible for NGER Reporting should ensure that they are familiar with these documents.

The NGER Legislative Documents include:

- *National Greenhouse and Energy Reporting Act (2007*): Sets up the framework of the Scheme, including thresholds (who has to report), obligations to register for the Scheme and the Governance Framework.

- *National Greenhouse and Energy Reporting Regulations (2008):* Provides detail on how to apply the Scheme regulations including definitions of operational control, facilities, the registration process, how to report data and reporting specific emission sources.

- *National Greenhouse and Energy Reporting (Measurement) Determination (2008):* Outlines of how to calculate emissions and energy use. This includes methods using default factors and higher order methods using site specific information.

- *NGER Technical Guidelines and Reporting Guidelines:* Both documents are reference documents that provide practical advice on the NGER process. These documents are not legislation and therefore provide user friendly explanations and worked examples.

Remember: These documents are amended regularly. Always access documents via the Department of Climate Change website to ensure that the most recent versions are being used. For example, the Determination has been amended for the 2009-2010 reporting year.

2.2.2 NGER Principles

The NGER legislation applies to all industries and is a 'one size fits all' legislative instrument. Due to this, there are a number of instances where it is not necessarily clear whether an energy or emission source is covered by the Determination or the appropriate methodology for calculations. The best way to approach this situation is to apply the principles of emission and energy reporting which are outlined in the NGER Determination:

- Transparency: Emissions must be documented and verifiable;
- Comparability: Emission estimates must be comparable to other companies within an industry. Consulting with the MLA to ensure all meat and livestock industries approach accounting issues in the same manner, consistent with Government accounting methods;
- Accuracy; and
- Completeness.

The Department of Climate Change can also be approached with specific queries. Companies that follow the Determination and make interpretations or decisions based on the principles outlined above, and have documented these decisions, should feel confident that they have complied with the legislation.

A further consideration it that what is actually reported at the end of a reporting year will be limited by the functionality of the Online System for Comprehensive Activity Reporting (OSCAR). For instance, although the principles of the Determination require purchased CO_2 to be reported, (at the time of writing) OSCAR did not provide functionality to report this information.

The following sections of this guide outline the NGER reporting requirements in more detail.

2.3 Reporting Energy and Emissions

NGER requires both energy and emissions to be reported. However, in practical terms, this often means only a quantity of a fuel source (in the appropriate units of measurement) needs to be reported. The resulting emissions and energy use are automatically calculated by OSCAR using the default factors published in the Determination.

Many companies calculate emissions on an ongoing basis to have an accurate understanding of their energy and emissions profile, both for compliance and risk management. This is especially important given the likelihood of emissions trading in Australia in the future (or at the very least, a cost on carbon). For the food industry, emissions accounting is also important as consumer trends and retailer requirements move towards carbon labelling and improved environmental impact and sustainability disclosure.

2.3.1 Greenhouse Gas Emissions

Greenhouse gas emission sources are broadly classified into three types; Scope, 1, 2 and 3. NGER requires all Scope 1 and Scope 2 emissions to be reported by companies that meet the NGER thresholds. These emission sources are detailed below in Figure 1.

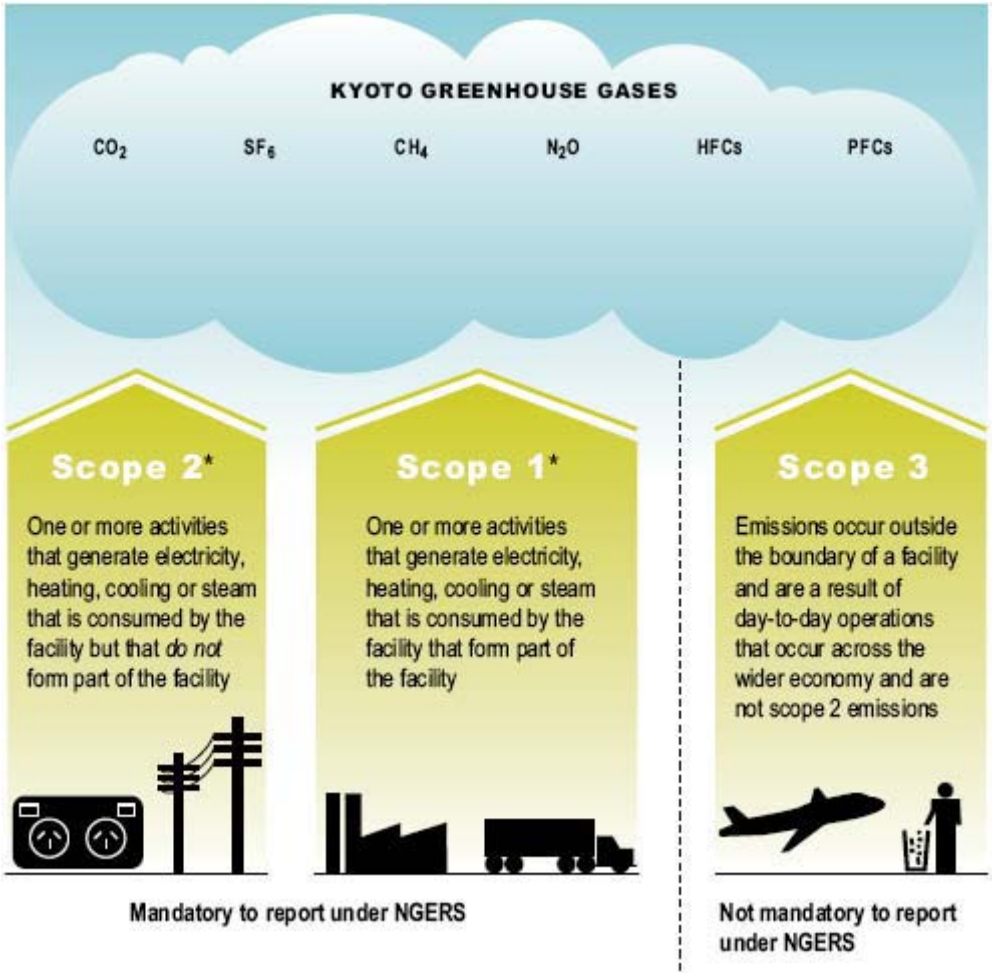


Figure 1 - Emission Types[1]

Scope 1 emissions occur from sources that are owned or controlled by the company. In the meat and livestock industry, the major source of Scope 1 emissions include:

- Emissions from the combustion of fuel (coal, natural gas, diesel etc) in boilers, vehicles or machinery;
- Fugitive emissions from wastewater treatment and solid waste disposal;
- Fugitive emissions released from refrigeration systems; and
- Fugitive emissions from livestock (however, these are excluded from reporting as they are agricultural emissions which are not covered by the Scheme).

[1] Source: http://www.climatechange.gov.au

Scope 2 emissions are produced from the generation of purchased electricity, steam or compressed air consumed by the company. Although the emissions are generated from the company supplying the energy, reporting companies are also required to report these indirect emissions.

Scope 3 emissions arise as a consequence of the activities of the company, but occur from sources not owned or controlled by the company, e.g. emissions from taxis and airline flights.

N.B. NGER only requires the reporting of all Scope 1 and Scope 2 emissions.

2.3.2 What is the industry's experience of the legislation?

Reading the legislation was the starting point for all companies, in order to determine if they were required to report under the Scheme. The legislation was then used as a constant reference document throughout the reporting process.

Feedback from many MLA members indicated that the legalistic, technical and generic (to all industries) nature of the legislation made it difficult to understand how NGER applied to their operations. External consultants were used by many companies to assist in understanding their corporate structure, identifying the emissions that would be applicable and the appropriate methodologies.

One of the easiest ways to simplify the complexity of NGER legislation is to understand how your company intends to report. For most items used in the meat and livestock industry, Method 1 will be used, meaning that only the quantity of fuel needs to be reported, with no emissions calculations required (this is done automatically by OSCAR). However, should a company wish to track their emissions and energy use (beneficial for continuous improvement) many Method 1 calculations are simple multiplication equations using default factors outlined in the Determination.

3 NGER Reporting Process

The reporting process is summarised in Figure 2.

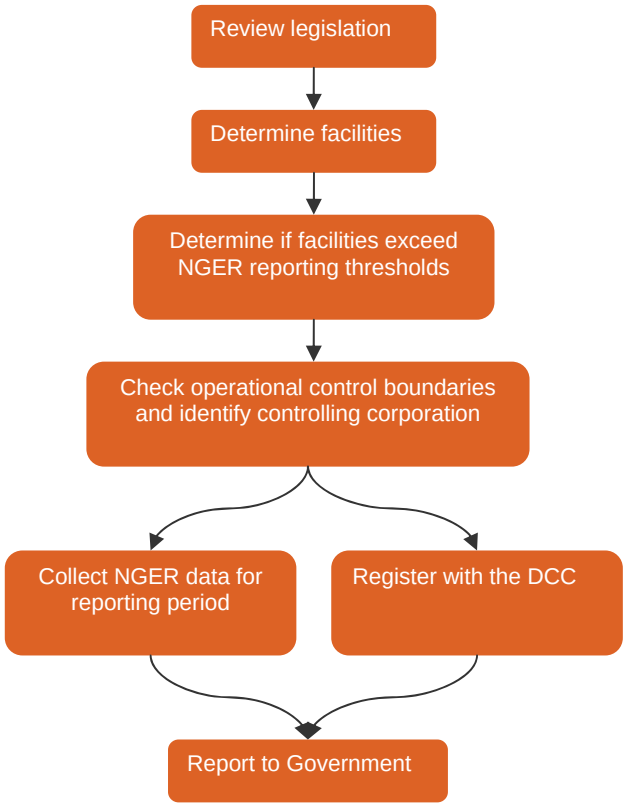


Figure 2 - NGER Reporting Process Diagram

3.1 Determining reporting obligations

Before determining reporting obligations the following definitions need to be understood.

Key Concepts

Operational Control

The entity with the authority to *introduce and implement* any or all of the operating, health and safety and environmental policies for a facility.

In general, if you operate a site, you have operational control.

Facilities

In general, facilities are operating sites that produce green house gas (GHG) emissions or produce or consume energy. Sites that are in close geographic location are usually considered to be one facility. A more detailed definition of facilities is provided in the NGER Regulations.

Controlling Corporation

This is defined in the 2007 Act as "*a constitutional corporation that does not have a holding company incorporated in Australia*". Practically this means the company at the top of the corporate group. Controlling corporations should consider all associated entities, whether owned, managed or joint ventured when establishing sites within their operational control. .

3.1.1 Operational control

One of the key concepts in the NGER legislation is that of operational control, where operators of sites are legally obliged to report. The definition of operational control is as follows:
An entity will have "operational control" over a facility if:

It has the authority to introduce and implement any or all of the following for the facility:

- *Operating policies;*
- *Environmental policies;*
- *Health and safety policies; and*
- *Meets the requirements of the regulations; or*

The Greenhouse and Energy Data Officer declares the corporation or member to have operational control of the facility.

If one party does not have the authority to introduce and implement all the policies above, it will be the party with the **greatest authority** that will have operational control.

3.1.2 Reporting thresholds

There are two aspects to the NGER reporting threshold; the **Facility** threshold; and the **Corporate** threshold.

The facility threshold covers activities at a single site and applies to both emissions and energy use (consumption and production threshold applied separately). The facility threshold has both an emissions and energy element and is 25,000 tonnes of CO_2 equivalence (tCO_2-e) taking into account Scope 1 and 2 emission sources or 100 terajoules (TJ) of energy consumption or production[2]. If any of these thresholds are met or exceeded (energy production, consumption or emissions), then an NGER report is required for the facility.

The corporate threshold is applicable if a corporate group operates one or more sites with combined emissions of 87,500 tCO_2-e or that consume/produce 350 TJ of energy[3]. In this instance, they must report on all energy use and emissions under their operational control across the group *regardless of the whether facility threshold is met for individual sites*.

For example, if a corporation operates five plants each emitting 20 $ktCO_2$-e they would need to report under NGER as cumulatively they trip the corporate threshold (despite the fact that none of these sites trip the facility reporting threshold)[4].

It is important to note that the corporate threshold decreases with time, falling to 50 $ktCO_2$-e in the 2010-2011 reporting year so while you may not be required to report this year, next year, the threshold may be surpassed. Also, if production increases or changes then the thresholds may also be reached. It is recommended that reporting thresholds are reassessed each year. Figure 3 shows the reporting thresholds and key dates from the start of the NGER scheme.

[2] The Energy threshold applies separately to energy production and energy consumption.

[3] For the 2009/2010 NGER reporting year

[4] Any facility that trips the facility threshold (25 ktCO2-e or 100 TJ of energy production/consumption) needs to report individually as well as within the corporate group as appropriate.

Thresholds

Sites emitting more than 25,000 tonnes CO_2-e or using or producing more than 100 TJ of energy are required to report under the NGER legislation.

Companies emitting more than 87,500 tonnes of CO_2-e or using or producing more than 350 TJ of energy need to report under the NGER legislation for all of their energy use and emissions.

Remember:

- Emissions thresholds are based on Scope 1 and 2 emission sources (direct emissions and emissions associated with electricity and energy purchasing). Note that this is different from the thresholds to determine liability under the Carbon Pollution Reduction Scheme which are based on Scope 1 emissions only (exclude electricity). The CPRS has the same 25 ktCO_2-e threshold but only Scope 1 emissions are taken into account. Therefore, a site that meets the facility threshold under NGER will not necessarily meet the CPRS threshold.
- Only one of the thresholds needs to be met. For example, if the facility energy threshold is met before the facility emissions threshold, the site will need to report.

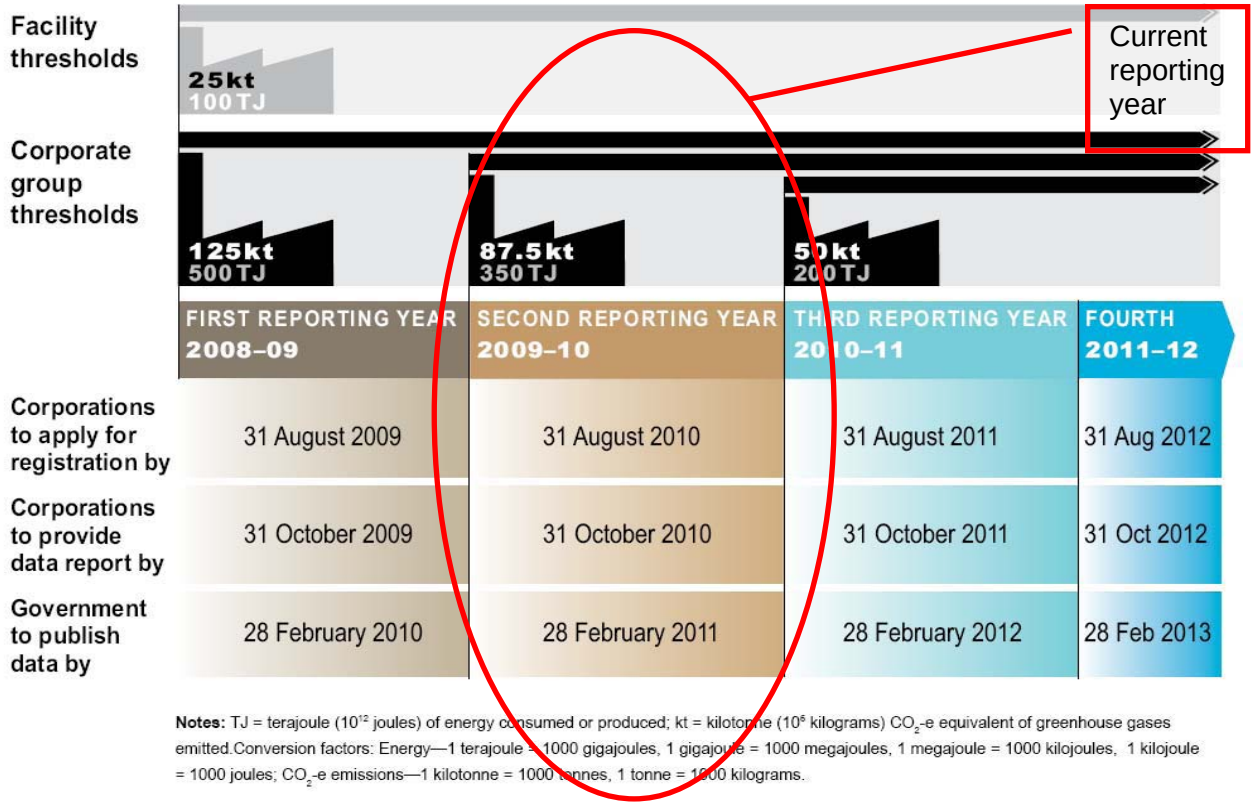


Figure 3 - Reporting Thresholds – Source: National Greenhouse and Energy Reporting Guidelines, Department of Climate Change

Before corporate and facility thresholds can be applied, an entity will need to have knowledge of its energy use and GHG emissions at both a facility and corporate group level. In some cases this data may be readily available via existing GHG reporting schemes such as Greenhouse Challenge Plus or other environmental reporting systems. In the absence of any data, the first task in establishing NGER reporting obligations is to quantify energy use and GHG emissions. The largest energy and emission sources for the meat processing industry are likely to be electricity use, coal and natural gas/LPG and wastewater treatment. Depending on the size of plant and fuel sources used, emissions and energy will vary significantly. Sites that use coal are more likely to meet the threshold than similar sized sites that use lower carbon alternative fuels.

3.1.3 Controlling corporation

Only controlling corporations have reporting obligations. A controlling corporation is responsible for all facilities (sites) under its direct operational control *and* those under the operational control of its members as shown in Figure 4. Members include:

- Subsidiaries;
- Joint Ventures; and
- Partnerships.

Where it is not clear, legal analysis of company structures may be required to determine if a company is a subsidiary of another company or where liability lies for partnerships or joint ventures. It is strongly recommended that external legal advice is sought for confirming company structure and the operational control conditions.

Whilst only controlling corporations are required to report, it is likely that subsidiaries will undertake the reporting and data collection to provide to the controlling corporation. It may also be the case that a subsidiary becomes aware of possible NGER reporting responsibilities before the controlling corporation. All NGER reporting should be centralised with the controlling corporation and decisions made at that level. This will require strong communication up the corporate chain.

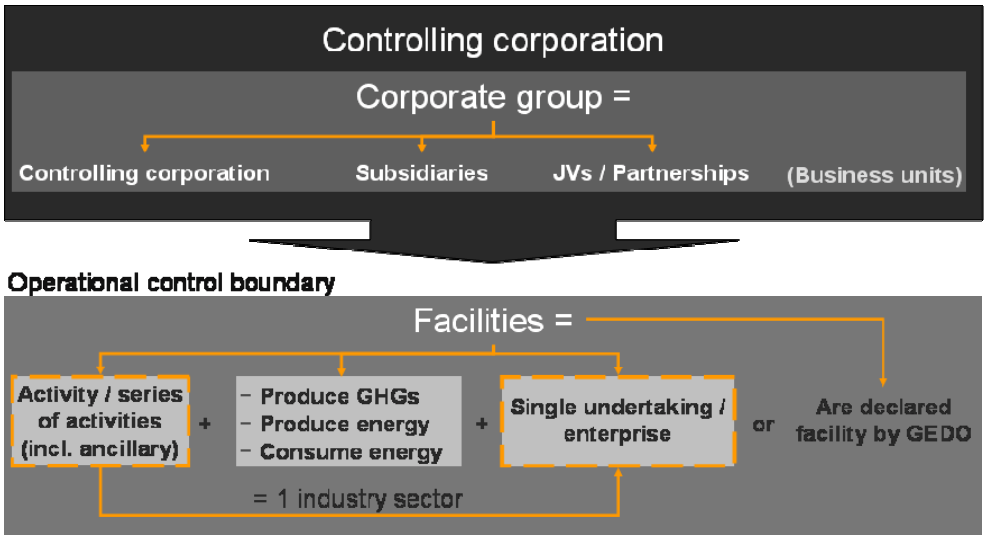


Figure 4 - Reporting Obligations

Key Learning - Operational Control
Accurately defining operational control is very important as it determines which party will have reporting obligations and in the future, potential permit liability under the CPRS. For effective risk management and to demonstrate due diligence, all decisions must be documented.

Operational Control Tips

- Review contracts to determine operational control and seek legal advice;
- Document all decisions and meetings;
- Identify facilities that are managed or operated by a contractor or third party and consider the authority the contractor or third party has to introduce and implement environmental, operational and health and safety policies;
- Enter discussions with relevant contractors to obtain data and integrate reporting into business practices; and
- Discuss issues directly with the DCC.

These issues are discussed in more detail in the worked example described later in the guide.

4 What needs to be reported?

4.1 Overview

This section of the guide identifies and discusses the potential greenhouse gas emission sources and NGER reportable items associated with the meat processing industry. The aim of this section is to provide an understanding of data requirements, how and where to locate the information and what information to enter into the Online System for Comprehensive Activity Reporting (OSCAR).

Data must be reported separately for each facility that meets one of the facility thresholds (>25 ktCO_2-e or 100 TJ of energy production or consumption). If the corporate threshold is met, data can be aggregated to a state level for *facilities that do not meet the facility threshold*. Aggregation of data from facilities is permitted for facilities within the same state and ANZSIC code[5].

The following must be reported:

- **Energy consumption** - amount of each energy source used (energy commodities), measured in standard units. This includes the combustion of fuels that will also have an emissions component and when energy is consumed only e.g. engine lubricants and greases;
- **Energy production** - amount of energy produced, measured in standard units; and
- **GHG emissions** - from activities other than fuel combustion must be calculated and reported as specified for each type of activity in the NGER Determination.

Greenhouse gas emission sources and reportable items that have been identified for the meat processing industry are shown in Figure 5 and described in more detail in

Table 1. Each emissions source or reportable item is then discussed in detail in the following sections. This is not an exhaustive list and there may be some unique issues associated with individual sites.

It should be noted that many MLA members who were required to report last year found that they met the energy consumption threshold before the emissions threshold.

[5] ANZSIC codes only need to be to the three digit level. These can be found in the NGER Regulations

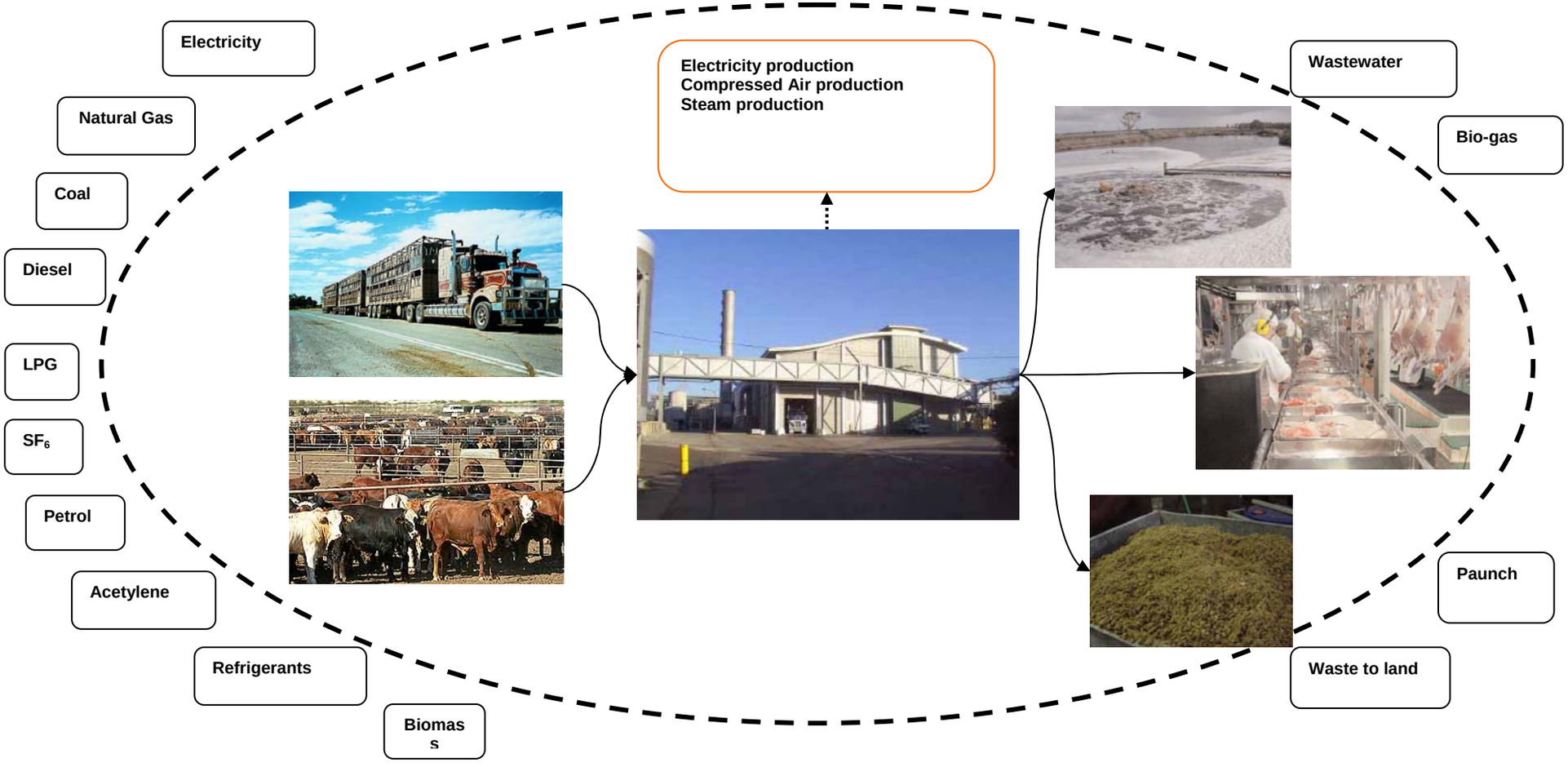


Figure 5 - Common Energy and Emissions Sources for the Meat and Livestock Industry

Table 1 - Data requirements table

Fuel type / Emission Source	Likely end use or source	Unit of measure / Data Required	Likely data source
Electricity consumption	Buildings, Equipment	kWh or MWh	Invoice data or meter readings
Natural Gas consumption	Buildings, Process	GJ	Invoice data or meter readings
Petrol consumption	Vehicles	Litres	Fuel card data, Mileage claims, Bulk delivery invoices, Hire car service provider
Diesel consumption	Vehicles, Generators, Other equipment	Litres	Fuel card data, Mileage claims, Purchase records
LPG consumption	Buildings, Vehicles, BBQs	Litres or kg	Invoice data, Purchase records
Bio-gas consumption	Boilers, Power generation	GJ or m^3	Metering data, Estimate
Biomass consumption (all sources)	Boilers, Power generation	Type of biomass Tonnes combusted	Invoice data
Coal consumption	Boilers, Power generation	Type of coal Tonnes combusted	Invoice data
Wastewater treated on-site	Wastewater treatment	Total production in tonnes[6] Quantity of sludge removed COD concentration and volumetric flow rate for Method 2	Production and operating data Sampling data
Biological treatment of solid waste	Paunch	Tonnes of wet organic waste	Production and operating data, Estimates
Refrigerants in systems over 100kg charge	Refrigeration systems	kg charge of each refrigerant type in tCO_2-e e.g. R404A	HVAC register, Name plate capacity on chiller, Maintenance Records
SF_6	SF_6 in high voltage systems	kg	Invoice data, Maintenance Records. Only if a site has operational control of the substation. In most cases, this will not be under the operational control of the substation and therefore will not be included.

[6] For Method 1

Fuel type / Emission Source	Likely end use or source	Unit of measure / Data Required	Likely data source
Acetylene consumption	Welding etc	kg	Invoice data. These and other sources are likely to be a very small percentage of the inventory and may be incidental (see incidental emissions later).
Power generation	On-site consumption	kWh or MWh Export or On-site use	Metering data
Steam production	Cooking, Process heat	Tonnes or GJ	Metering, Estimates
Compressed air production	Machinery	MWh or GJ	Metering, Estimates

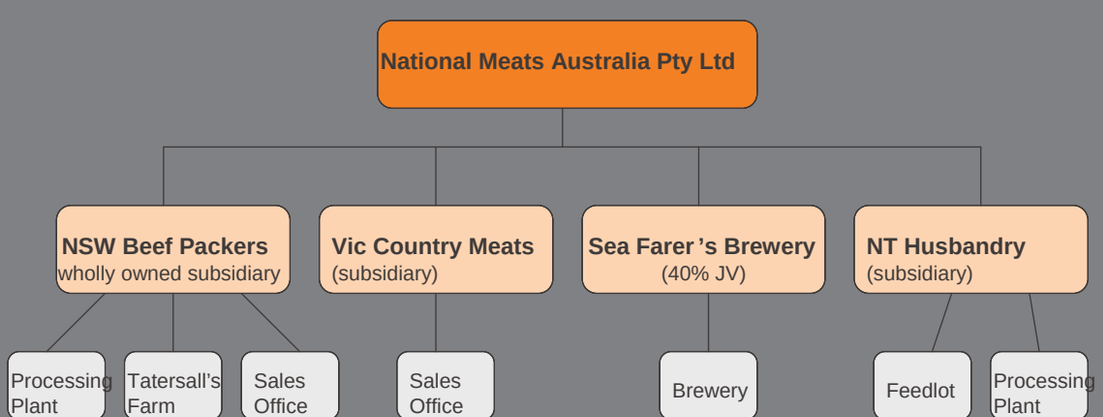
5 Worked Example

National Meats Australia Pty Ltd **(NMA)** is a holding company for four separate businesses. The businesses run completely separately and have their own management and accounting systems. NMA is aware of NGER reporting requirements and immediately contacts its subsidiaries and joint ventures.

Step 1: Is NMA a controlling company that meets the Corporate Reporting Threshold?

Controlling Corporation and Operational Control

NMA is a controlling corporation as it is the top of the corporate hierarchy. To determine whether it meets the corporate reporting threshold, all facilities under its and its members' operational control need to be determined. NMA identifies all its corporate members and the facilities they operate.



Operational control is easily defined at most sites, as the NMA members are the only entity involved in the sites ownership and operation. The exception to this is Tattersall's Farm which is owned by NSW Beef Packers (an NMA group member) but is operated by Green Pastures Pty Ltd under an Operation and Maintenance Contract and Lease dated 4 December 2008. Review of these contracts indicates that Green Pastures has the authority to introduce and implement all operational, health and safety policies. Therefore Green Pastures Pty Ltd has operational control and the site is not included in the NMA NGER reporting obligations. This decision is documented in a file note and Green Pastures is provided with a letter confirming this and informing them it will be their holding company's responsibility to report under NGER for Tattersall's farm (providing they meet NGER reporting thresholds).

A brief description of each business and its emissions and energy profile is outlined below.

NSW Beef Packers

NSW Beef Packers processes approximately 200,000 head a year, corresponding to 50,000 tonnes hot standard carcass weight (tHSCW). The processing plant consumes electricity from the grid (15 GWh) as well as using steam generated onsite from black coal (1,500 tonnes) and waste mineral oil (60 kl).

NSW Beef Packers site has two waste water treatment ponds, an anaerobic pond and an aerobic pond, both of which are uncovered. The outlet of Tattersall's Farm is owned by NSW Beef Packers and rented to another company, Green Pastures Pty Ltd. The farm takes the processing plant's paunch and other solid waste to compost. This company utilises steam and compressed air generated by the processing plant to run its feed packaging line for which it pays a standing fee as part of the lease. The site uses 2 GWh of electricity annually. NSW Beef Packers also operates a sales office in Brisbane. It uses about 500 MWh of electricity annually.

Victorian Country Meats

Victorian Country Meats processes approximately 100,000 head of mixed beef and lamb a year corresponding to 35,000 tHSCW. The processing plant consumes electricity from the grid (10 GWh) and uses steam generated from natural gas (30,000 GJ) and wood waste (1,000 tonnes), which it purchases locally.

There are two waste water treatment ponds, an anaerobic pond and an aerobic pond. Both are uncovered. The outlet of the waste water treatment ponds is fed as irrigation water to a neighbouring farm that is own by a private individual. Solid waste is collected by a contractor and disposed off site

Northern Territory Husbandry Company

The Northern Territory Husbandry Company runs a feed lot, holding on average 1,000 head of cattle at any one time, mostly for live export or processing locally by third parties. The company transports animals to port with a mix of contracted and own transport. The company purchases 300 kL of diesel annually but on sells half of this to contractors. This site also has an aerobic and an anaerobic waste water treatment pond treating approximately 100 ML per annum. The processing plant is small, consisting of a boning hall and cold store. No killing takes place at the site. It consumes electricity (2 GWh) and LPG (10 kL). A sales office is run out of Darwin and uses approximately 500 MWh of electricity.

Sea Farer's Brewery - Joint Venture

This is a South Australian based company which is a joint venture between National Meats Australia with a 40% stake and Drunken Sailor Pty Ltd which has a 60% stake. The site consumes 6 GWh of electricity and generates 400 ML of waste water per annum which it sends to the public sewer.

The Sea Farer's Brewery is an unincorporated joint venture and there are two controlling corporations that have NGER reporting obligations (even though NMA does not own a majority share). To avoid double reporting, NMA approaches its joint venture party to decide which party will be nominated to have reporting responsibility. It is decided that the other joint venture party will have responsibility given that they have majority ownership. A nomination form (including the information prescribed by legislation) is completed and registered with the Greenhouse Energy and Data Officer (Department of Climate Change), formally nominating the reporting JV partner (as required by the Regulations). NMA keeps a copy of this nomination on record.

Legal advice was sought throughout the operational control and joint venture process.

Threshold Assessment

NMA conducts a high level assessment of NGER reporting obligations using easily available energy and greenhouse gas data to assess whether it is likely to meet reporting thresholds. Data is collected for all sites, even those which are not under its operational control (for completeness). If NMA trips the current or future reporting thresholds, it will undertake further data collection and analysis to ensure that NGER obligations are met.

Figure 6 below summarises the initial energy and greenhouse gas data. NMA used the government supplied NGER calculator for major sources except wastewater. For wastewater, NMA used the Method 1 approach based on production levels and pro-rated this to the ML of wastewater generated.

A high level threshold assessment is conducted in Figure 7.

Company	Location	Item	Amount	Unit	Energy (TJ)	Greenhouse ($ktCO_2$-e)
NSW Beef Packers	Processing Plant	Black Coal	1,500	tonnes	40.5	3.6
NSW Beef Packers	Processing Plant	Electricity	15	GWh	54.0	13.4
NSW Beef Packers	Processing Plant	Waste Water	685	ML		8.9
NSW Beef Packers	Processing Plant	Waste Mineral Oil	60	kL	2.3	0.2
NSW Beef Packers	Processing Plant Sub Total				96.8	26
NSW Beef Packers	Tattersall's Farm	Electricity	2	GWh	7.2	1.8
NSW Beef Packers	Brisbane Sales Office	Electricity	500	MWh	1.8	0.4
NSW Beef Packers Sub Total					105.8	28.2
Victorian Country Meats	Processing Plant	Natural Gas	12,000	GJ	12.0	0.6
Victorian Country Meats	Processing Plant	Electricity	10	GWh	36.0	12.2
Victorian Country Meats	Processing Plant	Waste Water				6.2
Victorian Country Meats	Processing Plant	Wood Waste	1,000	tonnes	16.2	0.02
Victorian Country Meats	Processing Plant Sub Total				64.2	19
NT Husbandry	Feed Lot	Electricity	2	GWh	7.2	1.4
NT Husbandry	Feed Lot	Diesel	150	kL	5.8	0.4
NT Husbandry	Feed Lot	Waste Water	100	ML		1.3
NT Husbandry	Feed Lot Sub Total				13	3.1
NT Husbandry	Processing Plant	Electricity	6	GWh	21.6	4.1
NT Husbandry	Processing Plant	LPG	10	kL	0.3	0.02
NT Husbandry	Processing Plant Sub Total				21.9	4.1
NT Husbandry	Darwin Sales Office	Electricity	500	MWh	1.8	0.3
Sea Farer's Brewery	Processing Plant	Electricity	6	GWh	21.6	5.0
Sea Farer's Brewery	Processing Plant Sub Total				21.6	5.0
Group Total					226.5	59.4

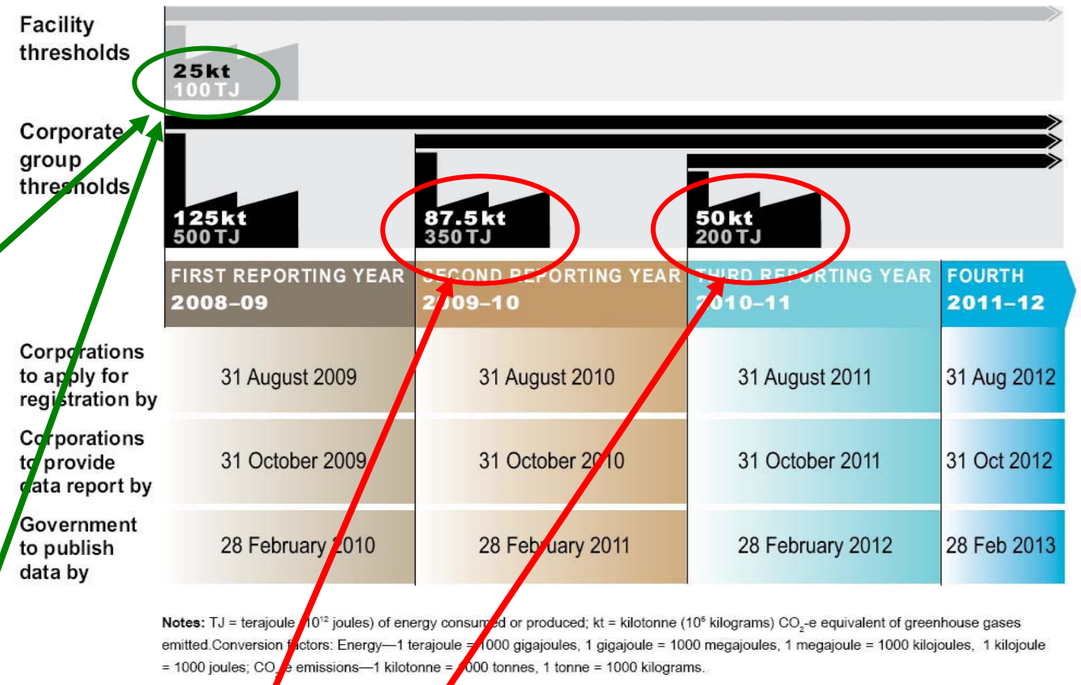


Figure 6 - National Meats Australia Rough Estimate of Energy & Emissions

New South Wales Processing Plant
Energy: 96.96TJ Greenhouse Gas: 26.05 $ktCO_2e$
Electricity: 15GWh = 54 TJ = 13.4 $ktCO_2e$
Black Coal: 1,500 tonnes = 40.5 TJ = 3.6 $ktCO_2e$
Waste Mineral Oil: 60kl = 2.3 TJ = 0.16 $ktCO_2e$
Waste Water: 50,000 tHSCW = 8. 9$ktCO_2e$

Victorian Processing Plant
Energy: 64.2 TJ Greenhouse Gas: 19 $ktCO_2e$
Electricity: 10 GWh = 36 TJ = 12.2 $ktCO_2e$
Natural Gas: 12,000 GJ = 12 TJ = 0.6 $ktCO_2e$
Wood Waste: 1,000 tonnes = 16.2 TJ = 0.02 $ktCO_2e$
Waste Water: 35,000 tHSCW = 6.2 $ktCO_2e$

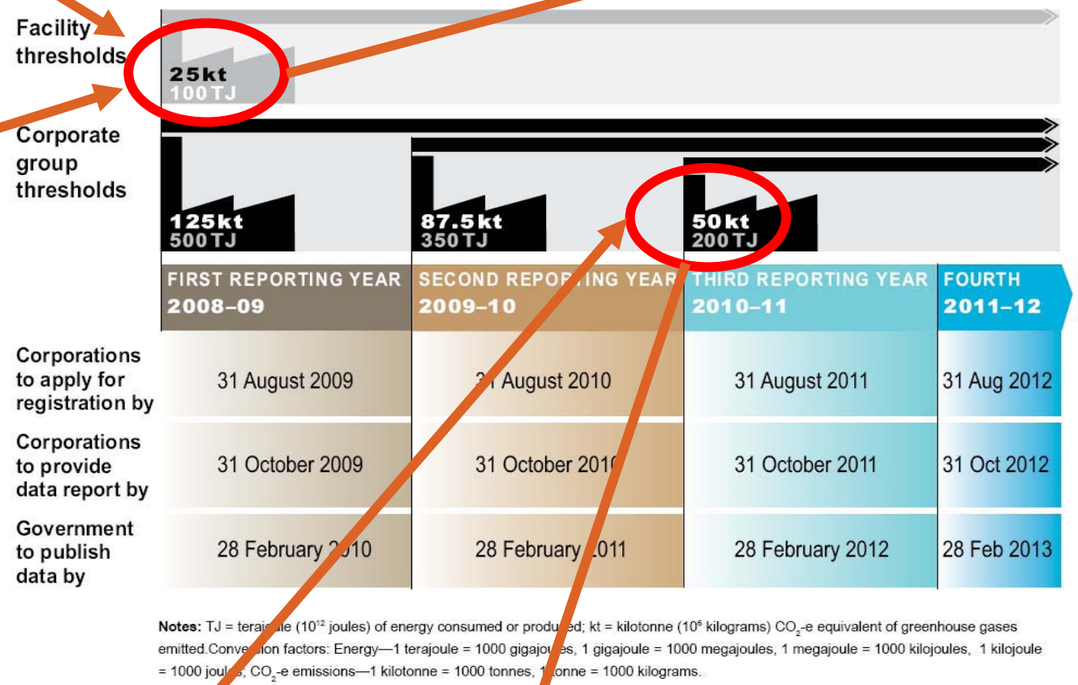
Brisbane Sales Office
Electricity 500 MWh = 1.8 TJ = 0.4 $ktCO_2e$

NT Processing Plant
Electricity 6 GWh = 21.6 TJ = 4.1 $ktCO_2e$
LPG 10 kL = 0.3 TJ = 0.02 $ktCO_2e$

Darwin Sales Office
Electricity 500 MWh
Energy= 1.8 TJ
GHG= 0. 3$ktCO_2e$

NT Feedlot
Electricity 2 GWh = 7.2 TJ = 1.4 $ktCO_2e$
Waste Water (estimated) 1.3 $ktCO_2e$
Diesel: 150 kL = 5.8 TJ = 0.4 $ktCO_2e$

National Meats Australia
Energy: 204.9 TJ Greenhouse: 54.4 $ktCO_2$-e



Notes: TJ = terajoule (10^{12} joules) of energy consumed or produced; kt = kilotonne (10^6 kilograms) CO_2-e equivalent of greenhouse gases emitted.Conversion factors: Energy—1 terajoule = 1000 gigajoules, 1 gigajoule = 1000 megajoules, 1 megajoule = 1000 kilojoules, 1 kilojoule = 1000 joules; CO_2-e emissions—1 kilotonne = 1000 tonnes, 1 tonne = 1000 kilograms.

Does not exceed site energy threshold of 100 TJ

Does exceed site Greenhouse threshold of 25 $ktCO_2e$

National Meats Australia will have to report energy & greenhouse for NSW processing plant in October 2009

Does not exceed Group energy threshold of 200 TJ

Does exceed Group Greenhouse threshold of 50 $ktCO_2$-e

National Meats Australia will have to report energy & greenhouse for all sites as a corporate entity in October 2011

This high level analysis outlines National Meats Australia's obligations. A more detailed assessment of each facility will have to be undertaken as reporting comes due.

Figure 7 - National Meats Australia's Revised Reporting Requirements

NMA compiled data for each site. To determine whether the NGER corporate thresholds were met, all the sites under NMA's operational control were assessed. Accordingly, the Brewery and Tattersall's farm sites were excluded. The corporate total was then compared to the corporate thresholds for this and future reporting years, indicating that although NMA is unlikely to reach the corporate threshold this year, it may meet it next year.

For this reason NMA made the decision to ensure the NGER data collection process for all sites commenced immediately to ensure that they have a robust dataset by the time they have to report. NMA contacts all its businesses to ensure a system is established to collect all NGER reportable data. The environmental manager is appointed to collect data for all companies and joint ventures and have a centralised reporting system which will be review annually.

To determine whether any sites are required to report this year, NMA looks at each site's sub-total. Only the NSW Processing Plant exceeds the facility emissions threshold. NMA will have to undertake a full NGER inventory for the NSW Processing Plant and report emissions in the 2009/2010 reporting year. Although this site is operated by NSW Beef Packers, it is NMA's responsibility to report. Therefore, they commence communication immediately with NSW Beef Packers to ensure data is collected accurately.

In the 2010/11 reporting year, when the corporate threshold is met and all sites have to be reported, the NSW processing plant and any other sites that meet the facility threshold will need to be reported separately.

NMA has systematically assessed it's NGER obligations and this decision making process, the underlying data and all assumption and legal advice should be documented formally. This is necessary to provide evidence in event of the DCC auditing compliance.

6 Reportable Data

NGER requires that data is reported for the reporting period which is the same as the financial year, 1st July until 30th June. In most cases, where Method 1 is used, only consumption or production data for emission/energy sources needs to be reported as an input into OSCAR. The system then applies emission factors to this data to calculate the amount of energy and associated GHG emissions. Therefore in this section, only the input data is described. OSCAR is described in more detail in Section 9.3.
The worked example in Section 7 provides context to the tables below and additional detail about the methods for calculation.

6.1 Energy Consumption

6.1.1 Electricity consumption

Electricity consumption	
Data Required	Total electricity consumption for the reporting period.
Units of measure	The unit of measure for electricity is kilowatt hours (kWh), megawatt hours (MWh) or gigawatt hours (GWh). The unit for OSCAR reporting is kWh.
Suggested data sources	Information can be sourced directly from invoices. It is likely that these invoices will be held by the accounts or finance departments. The invoice should include the quantity and cost of the electricity consumed. While invoice based data is preferred as this provides a clear audit trail, meter reading data can be used as an alternative. In any case, it is good practice to reconcile bills against meter readings to ensure accuracy of billing.

6.1.2 Natural gas and other gaseous fuels

Natural gas and other gaseous fuels	
Data Required	Total gas consumption for the reporting period.
Units of measure	The unit of measure for natural gas and other gaseous fuels is typically megajoules (MJ), gigajoules (GJ) or m^3. The unit for OSCAR reporting is GJ or m^3.
Suggested data sources	Information can be sourced directly from invoices. It is likely that these invoices will be held by the accounts or finance departments. The invoice should include the quantity and cost of the gas consumed. For biogas, direct metering is the likely source of accurate data on gas quantity. In the absence of metering data, the next best data source is likely to be an estimate based on end-use plant efficiency. The energy content is prescribed within Schedule 1 of the Determination[7].

[7] Line item 30: Biogas that is captured for combustion (methane only)

6.1.3 Liquid fuels

Petrol, Diesel, LPG	
Data Required	Total consumption for each fuel type for the reporting period. This should include fuel used in company cars for business travel. **Transport vs Stationary Use** NGER requires data for liquid fuels to be reported separately for stationary and transport use. Transport use is defined as fuel used in road registered vehicles. All other fuel, including in mobile machinery, is considered to be stationary use. For transport fuel, if fuel is used in vehicles post-2004 or Euro trucks, this needs to be separated and reported separately (different emission factors).
Units of measure	The unit of measure for liquid fuels is typically litres (L) or in the case of LPG, kilograms (kg). The unit for OSCAR reporting is kL (thousand litres).
Suggested data sources	Information can be sourced directly from invoices. It is likely that these invoices will be held by the accounts or finance departments. The invoice should include the quantity and cost of the fuel consumed. Alternatively, fuel consumption data can be sourced from meter readings (flow meters etc), tank dips, fuel card systems or log books depending on the system used for tracking fuel usage. If the above is not available, it is recommended that an estimate is made. For vehicles, distance travelled is a commonly used proxy when combined with the efficiency of each vehicle (litres/100 km). Mileage claims are often the only source of data for business travel and commonly fuel use is not tracked. A fuel quantity tracking system should be implemented to capture this data. If only cost data is available then this can be used as a proxy for fuel usage. It should be noted that if a data source is not incidental, estimates of fuel consumption are non-compliant (a discussion on what sources are incidental to a facility or inventory are discussed in Section 6.4.1). However, in the absence of actual data and with reference to the principles of NGER, an estimate is better than under reporting. As with all data items, the methodology for preparation should be fully documented.

6.1.4 Coal, biomass and other solid fuels

Coal, biomass and other solid fuels	
Data Required	Total consumption of coal and biomass fuels for the reporting period. The type of coal or biomass.
Units of measure	The unit of measure for solid fuels is tonnes (t) or GJ. The unit for OSCAR reporting is tonnes.

Coal, biomass and other solid fuels	
Suggested data sources	Information can be sourced directly from invoices. It is likely that these invoices will be held by the accounts or finance departments. The invoice should include the quantity and cost of the solid fuels consumed. For coal, the classification is required (black, brown etc) and this best sought from the supplier. For biomass, the NGER classification is also required and this best sought from the supplier[8].

6.1.5 Acetylene

Acetylene is frequently used in welding and cutting (oxyacetylene) and although arc welding is becoming increasing common, is still likely to be used on many sites. NGER requires that the energy use from acetylene consumption is reported and the associated emissions[9].

Acetylene	
Data Required	Quantity of acetylene used.
Units of measure	The unit of measure for acetylene is kg or litres. Oscar input requires a GJ conversion.
Suggested data sources	Information can be sourced directly from invoices. It is likely that these invoices will be held by the accounts or finance departments. The invoice should include the quantity and cost of the acetylene consumed. Stores data on usage.

6.2 Emission Sources

6.2.1 Wastewater

Wastewater is likely to be the most difficult aspect of NGER reporting for the meat processing industry. Initially, it is suggested that the wastewater treatment processes that occur at each facility are defined and documented. Essentially, if the treatment method is managed aerobic, then no methane is generated and so no emissions are reportable. However, if the wastewater treatment method is anaerobic or unmanaged aerobic then the emissions need to be calculated using the methodologies set out in the NGER Determination. It is common in the meat processing industry for both aerobic and anaerobic ponds to be used, that is, waste water is treated aerobically and then anaerobically.

[8] Dry wood, green and air dried wood, sulphite lyes, bagasse, other primary solid biomass

[9] This is reported as line item 27, gaseous fossil fuels other than those mentioned in items 17 to 26.

Key Task – Identification of Type of Wastewater Treatment System

It is important that the type of treatment system is accurately defined as this has a material impact on the emissions calculation. The key questions sites need to address are:

1. Do you use a managed aerobic treatment system for all your wastewater?
If yes, then no emissions are reportable.

2. Do you use an unmanaged aerobic or anaerobic treatment system for your wastewater?
If yes, use Method 1 and the default factors

There are three principal methods for reporting waste water emissions under NGER, Method 1, Method 2 and Method 3. **All sites that reported in the 2008/09 reporting period used the Method 1 approach which basically uses default factors all based on a production value in tonnes**. Given the general lack of data on waste water emissions within the industry, the MLA recommends that Method 1 is used for NGER reporting until such a time as the DCC revises the default factors to the point where it is appropriate that higher order methods are adopted.

The requirements of each method are described below:

6.2.1.1 Wastewater Method 1

For Method 1 the DCC has released a waste water emissions calculator, available at:
http://www.climatechange.gov.au/government/initiatives/national-greenhouse-energy-reporting/tools-resources.aspx
While this calculator is not the easiest to use, it does simplify the reporting for Method 1 and requires only minimal inputs.

Wastewater Method 1	
Data Required	Total production of meat product. Quantity of methane captured, flared or transferred.
Units of measure	Tonnes of hot standard carcass weight (tHSCW). If necessary, methane in m^3.
Suggested data sources	Production data.

Care needs to be taken when calculating emissions from sludge. The Method 1 approach allows for the COD load of the sludge removed from the treatment system to be subtracted from the total COD loading of waste water stream.

If sludge is removed from the wastewater stream or treatment lagoons, the COD concentration needs to be measured or at least estimated so that the correction can be applied through the calculator. The figures required are:

- Fraction COD in sludge removed; and
- Fraction of COD in sludge removed that is anaerobically treated.

6.2.1.2 Wastewater Methods 2 and 3

Methods 2 and 3 for waste water emissions calculations require a higher degree of actual data rather than relying on default values. The same calculator tool can be used as for Method 1 however, measurement of COD and volumetric flow rates is necessary.

Wastewater Method 2	
Data Required	Volumetric flow rate. COD concentration.
Units of measure	Refer to standards listed in the Determination.
Suggested data sources	Requires direct measurement – refer to waste water chapter in the Determination.

6.2.1.3 Waste treated on-site

Emissions from on-site waste disposal (e.g. paunch waste) are reportable under NGER. The methodology for calculating waste emissions of biological origin is based on the IPCC Tier 1 model and is detailed fully in the NGER Technical Guidelines, Section 5.22. Emissions for methane and nitrous oxide can be calculated using the default factors for composting.

Biological Treatment of Solid Waste	
Data Required	Mass of wet organic waste.
Units of measure	Tonnes
Suggested data sources	Production and operating data, Estimates

6.2.2 Refrigerants

NGER lists certain refrigerant gases that are reportable & these are available in the Determination. Facilities whose primary activity is meat processing[10] need to report on emissions from refrigerant gases. The reporting of refrigerants is limited to systems with greater than 100 kg charge. To adequately address reporting and as part of an audit trail, it is recommended that a register of refrigerants is developed at each site. This should include the type of refrigerant, the system size, the number of chillers and the dates of any recharge. This register should be periodically updated or on an annual basis.

The methodology for reporting on refrigerants is described below:

Method 1 - total stock of each reportable refrigerant type (data can be sourced from nameplate capacities) over 100kg. This is reported in tCO_2-e by multiplying the quantity of refrigerant by the Global Warming Potential (GWP). A default loss factor of 16% is then applied to estimate the GHG emissions for industrial refrigeration, 23% for commercial refrigeration or 9% for commercial air conditioning[11]. These loss factors are correct at the time of publication but should be reviewed annually in the Determination.

[10] ANZSIC classification subdivision 11

[11] For industrial refrigeration systems.

Method 2 - the quantity of refrigerant recharge is reported, multiplied by the GWP.

Refrigerants	
Data Required	Total system charge. The quantity of refrigerant gas on site. The GWP of the refrigerant.
Units of measure	Kg. The data required for OSCAR entry is the total stock in tCO_2-e.
Suggested data sources	Nameplate on equipment, utility provider. Material safety data sheets for GWP.

Key Task – Identification of Refrigerants
These should be available from the manufacturer's documentation, or your maintenance service provider.

Commonly used refrigerants which are reportable include R134a and the blended refrigerant R404a. These have a GWP of 1,300 $kgCO_2$-e/kg and 3,260 $kgCO_2$-e/kg respectively.

NB. Where a blended refrigerant is used, a weighted GWP should be applied based on the composition of the blend.

6.2.3 SF_6

Sulphur Hexafluoride (SF_6) is used as an arc suppressant in high voltage (HV) switch gear and is likely to be present at many meat processing sites. The gas has a very high GWP and one kg emitted equates to 23,900 $kgCO_2$-e. SF_6 is included as a reportable item under the NGER legislation and the method for reporting is that the stock value is multiplied by a default loss factor of 0.5%.

One area of confusion with SF_6 is operational control. If the facility has operational control over the HV system and the SF_6 within it, then it should be included within the NGER dataset for that facility. If the switch gear is under the operational control of the grid operator/utility company then it should be excluded from reporting (it will be included within the operator/utility company's NGER report). The reporting of SF_6 should be specified in writing between the site and utility so that a clear audit trail exists.

x

Sulphur Hexafluoride (SF_6)	
Data Required	Total system charge. The quantity of SF6 gas on site.
Units of measure	Kg. The data required for OSCAR entry is the total stock in tCO_2-e.
Suggested data sources	Nameplate on equipment, utility provider.

6.3 Energy Production

NGER requires the reporting of all energy consumption and production. This includes electricity as well as energy intermediaries such as steam and compressed air (these are collectively known as energy commodities) even though the energy consumed to produce each commodity is already reported within the energy consumption aspects of NGER.

6.3.1 Steam

Under the NGER regulations the energy in steam needs to be reported. Many plants use process steam and do not have steam metering; hence collecting this data can be problematic. If data on steam production is available then it should be included within the NGER report for each facility accordingly (converted to the reporting units). If not, then the energy in the steam can be calculated based on total input energy and boiler efficiency. Refer to the worked example for suggested calculation methodologies.

Steam	
Data Required	Quantity of steam.
Units of measure	GJ
Suggested data sources	Steam metering. Estimation based on boiler efficiency (see worked in example in next section).

6.3.2 Electricity production

Electricity production	
Data Required	Total electricity produced from power generation. This includes diesel generators and backup systems.
Units of measure	The unit of measure for electricity is kilowatt hours (kWh), megawatt hours (MWh) or gigawatt hours (GWh). The unit for OSCAR reporting is kWh.
Suggested data sources	Data on electricity generation from diesel or other generators can be sourced from metering or in the absence of this data, estimated based efficiency, run hours, generator rating, loading or fuel consumption. This data is commonly available in the technical manuals provided with this type of equipment.

6.3.3 Compressed Air

All energy production is reportable under NGER and this includes compressed air. There is no prescribed methodology for calculating the energy produced and in many cases, compressed air systems are not metered. In the absence of production data, an estimate based on compressor efficiency and run hours should be made. See the worked example for more detail.

Compressed air	
Data Required	Energy value of compressed air produced.
Units of measure	GJ

Compressed air	
Suggested data sources	Metering. Estimate based on plant efficiency.

6.4 Other Considerations

6.4.1 Incidental Emissions

Some things are easy to quantify, other things could be quite difficult. In deciding how far to go consider the materiality of the emission that is being estimated. If they qualify as incidental, then industry standard estimation methods may be used with supporting documentation.

Key Concept – Incidental Emissions & Energy Sources

Estimating incidental emission sources (Facility)

- Emissions/Energy of the facility are equal to or less than:
    - 2% of the group's total inventory; and
    - 3 $ktCO_2$-e or 15 TJ respectively; and
- In total, the amount of estimated emissions across the group does not exceed 5% of the group's total inventory.

Estimating incidental emission sources (Group)

- The individual emissions / energy source is equal to or less than:
    - 0.5% of that facility's energy use/emissions; and
    - 3 $ktCO_2$-e or 15 TJ for the year; and
- The total amount of all incidental sources is less than 2% of the total facility amount or 12 $ktCO_2e$ or 60TJ total.

6.4.2 Contractors

Energy and emissions data must also be reported for all contractors (working on facilities under the liable entity's operational control). Contractor data can be aggregated into the facility reporting unless the emissions from the activities undertaken by contractors:

- Produce 25,000 tonnes of CO_2-e or more; or
- Produce 100 TJ of energy or more; or
- Consume energy of 100 TJ or more.

- Contractor data needs to be reported separately if any of the above thresholds are met.

6.4.3 Pro-rating

Energy related data does not necessarily conform to the financial year. For example, invoicing dates do not always align to the beginning and end of each month and deliveries of fuel are usually on an as needed basis rather than the 1st of every month. Therefore, facilities can either report based on energy purchased within the reporting period, i.e. the bills received in the period, or based on consumption within the period. This may mean pro-rating data to align with the financial year and normalising non-monthly data. The choice is primarily dependent on the specifics at each facility however, consistency in approach is essential. In all cases, documenting the process of preparing each NGER dataset is important.

6.4.4 Measurement criteria

For each reported item, the data needs to be classified in terms of measurement criteria. The specifics on criteria vary for each fuel type and are described fully in the Determination, but essentially, there are four criteria, namely:

- Criterion A - Data as evidenced by invoices (involving a commercial acquisition);
- Criterion AA - Data as evidenced by invoices and adjusted for changes in stockpile;
- Criterion AAA - Data measured at the point of consumption via equipment calibrated to industry or Australian standards; and
- Criterion BBB - Data derived through simplified consumption measurements such as estimation (including pro-rating of data). These should be in line with industry practices.

The measurement criterion is required when data is being entered into OSCAR and relevant sections of the Determination for each reportable item should be reviewed prior to submission.

7 Worked Example Inventory

In example previously described, NSW Beef Packers was the only site within the NMA group required to report in 2009/2010. They were directed to prepare a detailed site process map of all their activities, which is available in Figure 8. The list of fuels is much greater than in Figure 6 as the legislation requires all sources to be identified and accounted for, so a much greater level of detailed is required than in the initial assessment of reporting requirements. Further to this, where and how the site uses the fuels will influence their associated emission factors. For example diesel used in a generator, (stationary energy), will have a slightly different emission factor to diesel used in a truck (transport energy).

It is essential that the list of fuels and emission sources for each site is checked against the Determination. This should be done on an annual basis in advance of a reporting period to allow for the necessary data collection processes to be established in advance.

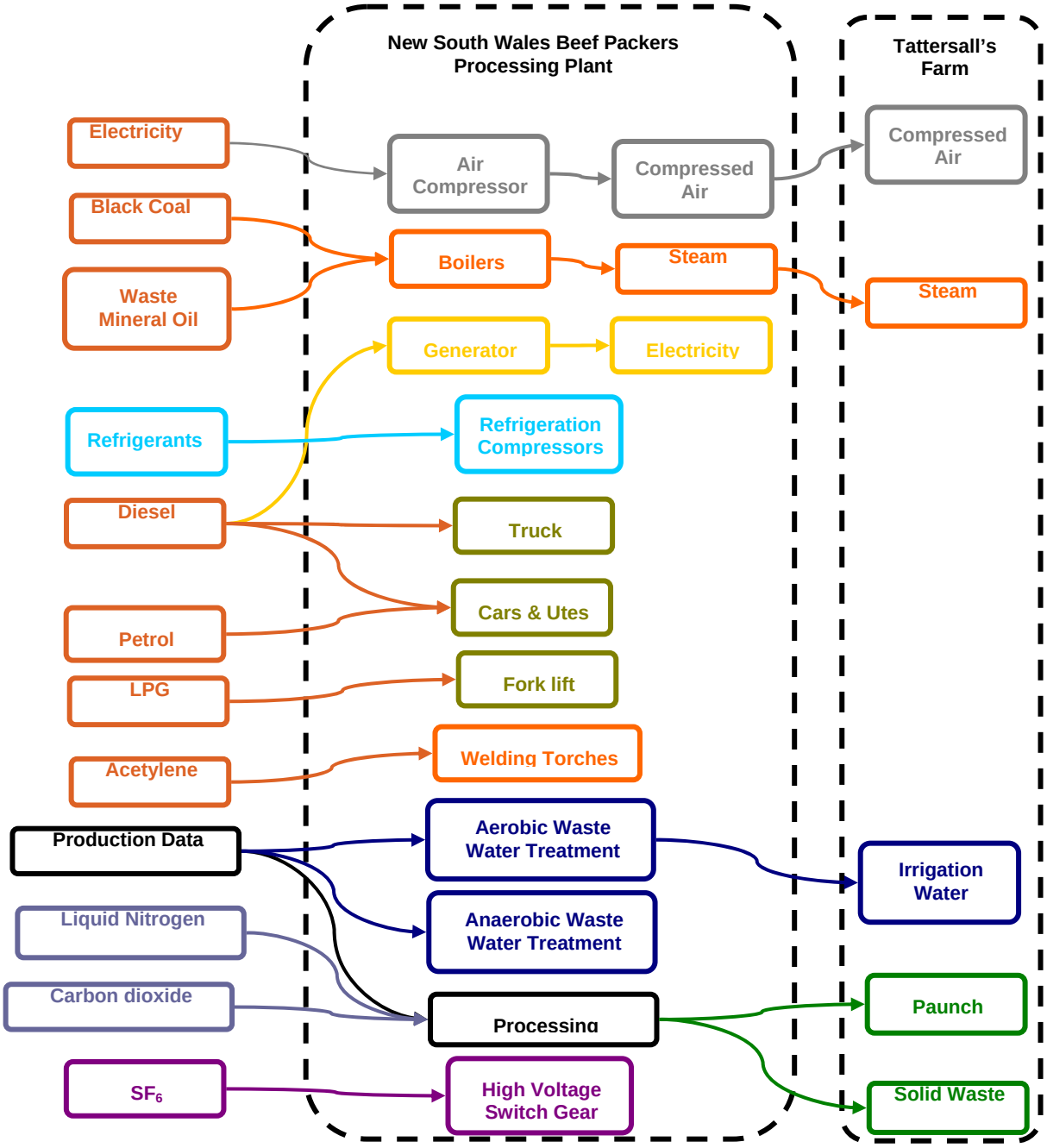


Figure 8 - NSW Processing Site Input Outputs Diagram

7.1 Exclusions

There are a number of items in the input output diagram that are not part of the NGER legislation and therefore not necessary for reporting.

- Firstly the liquid Nitrogen and Carbon Dioxide used in packaging are not reportable under NGER.

- Also not reported are the energy or emissions which are transferred off site (the Scope 3 emissions). Energy and emissions are only reported when they occur within a facility boundary. Therefore where the boundary is drawn is important. For NSW Beef Packers, the paunch and solid waste is transferred to the farm for treatment these items are excluded from the NGER report.

- One of the refrigeration units uses ammonia and this is not covered by the NGER legislation therefore does not need to be reported.

- For the SF_6, discussions with the utility company indicated that, while the site owns the switch gear, the utility has operations and maintenance responsibility. No one from the site has access to the enclosure and the utility's Health & Safety standards apply. This means that the switch gear is under the utility's operational control. A letter was requested and received from the utility confirming that they have operational control of the SF_6. Therefore it can be excluded from the NGER report.

Key Task - Inclusion/ Exclusion of Emissions

This is the point where most of the judgments and reporting decisions are made in compiling an NGER inventory. In making these decisions it is important to:

- Be as comprehensive as possible when listing inputs and outputs of a site. This will allow you to consider all possible emissions and make appropriate decisions to exclude or attribute to third parties.

The sites revised diagram is presented in Figure 9 below

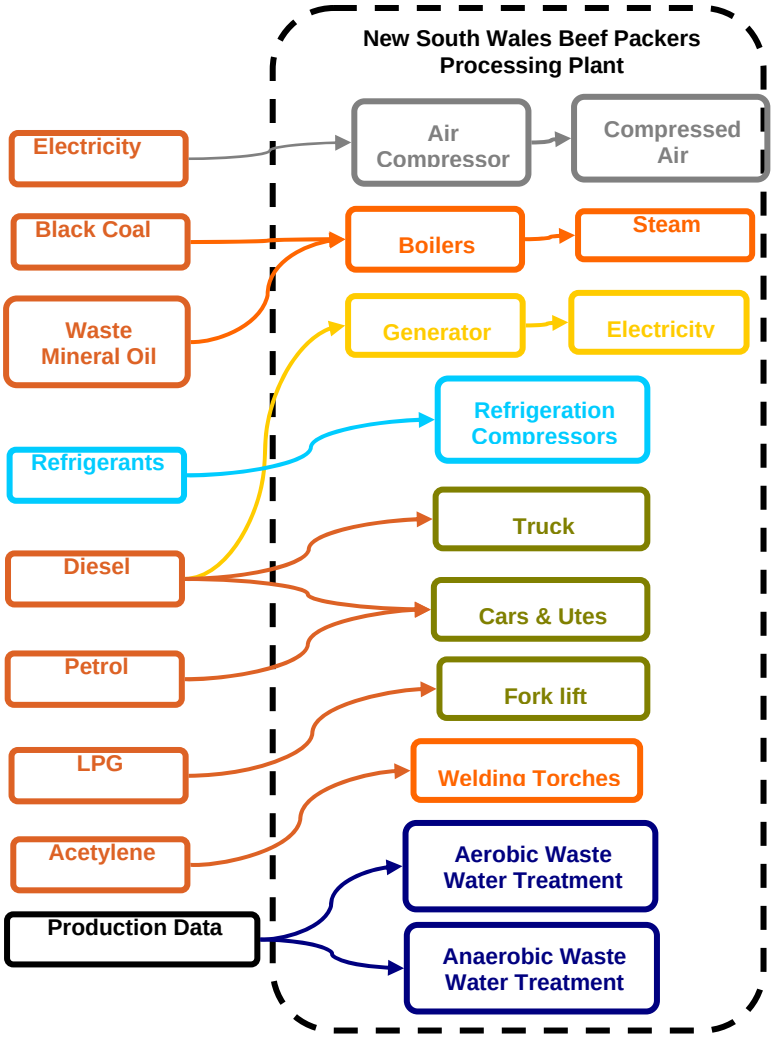


Figure 9 - NSW Processing Plant Revised Inputs Outputs Diagram

7.2 Data Sources

The following is a brief commentary on the data sources used in compiling the NGER inventory for NMA. Data for the bulk of the inventory items was readily available via invoices which had details of the delivered amounts or meter readings of consumption. It is good practice for all these sources to be consolidated into a single list or data register for reference and auditing purposes. An example NGER data register is shown in Appendix C.

As is common at most sites, there is no system to differentiate between end use of liquid fuels. NGER requires that transport and stationary usage is separated. The site only uses diesel in their generator and so all the diesel was reported as stationary use.

The production data is already carefully collated and should also be referenced in the data register. This is particularly critical as the production data forms the basis of the wastewater emissions calculation.

In order to assess the possibility of emissions associated with refrigerants, a survey of all refrigeration equipment was conducted. This was undertaken by the maintenance engineer, as shown in Appendix D. The Ammonia in the freezer system does not have to be reported under NGER and only one unit was found to have a charge in excess of the 100 kg reporting threshold therefore refrigerant in the other chillers can be excluded from reporting.

In order to accurately establish the energy produced (in electricity, steam and compressed air) it would be necessary to meter the outputs of the various transformational systems on the site. If there are meters on boilers, electrical generators and the compressed air system then these values should be included in the data register and monitored accordingly. It would also be important to maintain calibration records of these meters and document the data collection process. However this was not possible for NSW Beef Packers as they do not have a functioning steam meter, compressed air meters or an electricity meter on the generator. The only option available was to estimate the energy produced and document the assumptions.

In estimating steam production the site engineer decided to quote a survey of boiler performance conducted in the UK[12]. This suggests that the average efficiency of coal fired boilers is 70% and heavy fuel oil boilers 74%. These benchmark figures together with the delivery dockets for black coal and waste mineral oil provided the reported figures for steam generated.

In estimating compressed air production, a survey of the compressed air system that had been completed by a contractor one year ago was referenced. It estimated that the site used 684 MWh in 2007. Production in 2007 was 80% of current levels and so the estimate was increased to 855 MWh. The manufacturer's literature provided efficiency for the compressors of 50%.

The electrical generator is only used in emergencies, and is run monthly to ensure it is functioning correctly. It has a 1,000 litre tank which according to anecdotal evidence, was filled once in the last financial year. The manufacturer's documentation stated that the generator had an efficiency of 30%.

[12] Carbon Trust ECG066 Steam Generation Costs, 2003, www.carbontrust.co.uk

7.3 Example Greenhouse Inventory and Commentary

The resulting inventory for New South Wales Beef Packets is presented in Table 2.

Table 2 - New South Wales Beef Packers NGER Inventory

	Volume	Unit	Energy (TJ)	Scope 1 Greenhouse (tCO_2-e)	Scope 2 Greenhouse (tCO_2-e)
Energy Consumed					
Black Coal	1,500	tonnes	40.5	3,581	
Electricity	15	GWh	54	0	13,350
Waste Mineral Oil	60	kL	2.33	161.1	
Diesel	1000	Litres	0.04	2.7	
Petrol	2500	Litres	0.09	6	
Subtotal			**96.96**	**3,750.8**	**13,350**
Emission Sources					
Refrigerants (R404A)	180	kg		93.9	
Waste Water	685	ML		8,858	
Subtotal				**8,951.9**	
Site Total					
Site Total			**96.96**	**12702.7**	**13,350**
Energy Produced					
Compressed Air	1.54	TJ			
Electricity	0.005	TJ			
Steam	28.35	TJ			
Waste Mineral Oil	1.72	TJ			
Site Total	**31.615**				

There a few issues of note with respect to the above inventory. The site is on the cusp of both the energy and greenhouse thresholds but currently is only triggering reporting on the emissions threshold. Changes to activity levels may increase or decrease energy use and emissions to a point where it no longer needs to report. However once registered and reporting it will require a minimum of

two years of demonstrated energy and emissions below the thresholds before it is possible to deregister.

The relationship with Tattersall's farm is important and changes in this relationship, e.g. NMA taking over operation, would have a significant effect on the inventory. At present no emissions associated with solid waste or paunch disposal are included in the inventory. This could change if the farm was taken back under NMA's operational control. It would be advisable for the site to maintain records regarding these sources so that they may be reported easily if the relationship ever changes.

8 Data management and Documentation

8.1 Overview

To comply with the requirements of the NGER Act, data and information required for reporting needs to be maintained for a period of **seven years**. The majority of the source information used to compile the NGER report should be captured by standard business record keeping procedures within the accounts department. In the event of an audit, a strong evidence trail is beneficial and so invoice numbers and supporting documents should be kept along with the consumption information data. For consistency and traceability, it is advisable to keep a data collection manual/map/register of records for each reporting year which outlines the data items included, the location of the original source data (such as invoices) and any amendments made to the data.

Examples of possible documentation have been provided in Appendix B and Appendix C.

8.2 Register of Records

To facilitate the data management aspects of the process, it is recommended that a Register of Records be developed by and maintained at each site/centrally. An example is available in NGER Data Register in the Appendices.

The purpose of the Register of Records is to simplify the data gathering process by providing guidance on what data needs to be captured, who is responsible for the collection of data and where the data can be obtained. The records indicate the type or source of information that is ultimately captured in the data collection process.

A Register of Records must clearly identify the different records that are required for the NGER inventory based on a review of activities on each site. The method by which the information is collected at a site level is determined by the source and location of the desired information. Information can be provided direct from a supplier, obtained via meter readings, generated in-house or collated from external sources. The storage location of the records must be clearly defined in the Register.

The Register of Records needs to identify the record actions. This relates to when specific information is collated, reviewed, updated and tracked. For example, invoices may be sent to the site on a monthly basis and are therefore tracked on a monthly basis.

The Register of Records needs to record who is responsible within each site for the collection of energy and greenhouse data.

The Register of Records will become a part of the corporate memory at each site. It will ensure that the inventory and reporting processes can be consistently repeated in future years, even if the personnel that currently manage data collection were to leave the organisation. Further, it will provide an auditor with a clear audit trail of documentation.

Table 3 provides a description of suggested data fields within a Register of Records.

Table 3 - Example Register of Records

Record Name	Record Source	Location	Access	Record Actions	Action Personnel
Electricity 08-09.xls	Monthly Invoice	Accounts (site)	Electronic: Drive/Folder Hardcopy: Cabinet 4, Draw 2	Monthly data input Reconciliation against meter readings	Louise (accounts)

In order to oversee this data management process, it is recommended that sites implement a Record Keeping Policy for NGER data, if such a policy does not already exist. This policy would act as an overarching guide to records management and would be a useful starting point if the NGER inventory were to be audited. A suggested policy has been provided in Appendix E.

8.3 Record Keeping Conventions

Record keeping conventions, including labelling and storage requirements, should be developed to ensure all records (documents, spreadsheets, and calculations) are labelled and stored in a consistent and appropriate manner. This is particularly important for the development of suitable and reliable audit trails; and to prevent error and confusion. It is also helpful for new personnel to locate documents and records easily.

Files should be stored together in subfolders to organise the information. The location of all documents should be accurately recorded within the Register of Records. If hard copies of records are not available, electronic storage requires secure backup.

Consistent use of record labels ensures easy cross-reference between files, folders (electronic and hard copy) and subfolders. For example (in the case of an electronic document):

- A brief description of the purpose of the document;
- Version/date of the document, v0.1, 0.2 etc; or
- Year (four digits for calendar year, last two digits of each calendar year for financial year); and
- The appropriate computer program extension (doc, xls, ppt, csv etc); e.g. XYZ_plant_Diesel_Consumption_0809_v0.1.xls

Obsolete records are those that have been used in previous reporting periods, have been replaced or substituted, or changed/updated in any way. Obsolete records must be retained for a period of 7 years.

In order to avoid confusion between obsolete and current documents, sites should establish a procedure for the management of obsolete versions of records. For both soft and hard copies, this should involve clearly marking the documents as obsolete and changing the location into an obsolete document folder. This process will avoid the use of past documents in current reporting years.

8.4 Annual Updates and Review

Each year a review of the NGER regulations and the Determination should be conducted to ensure that up-to-date and relevant information and data is being collected and reported. Since the first reporting period ended (June 2009) a number of significant changes were made to the Determination which results in different methodologies for data reporting. It is anticipated that, as the scheme evolves over the next few years, further changes will occur and so an annual review is necessary to ensure compliance.

In addition, site activities, energy use/production and emission sources may change year to year. This review should occur prior to the reporting year so that any changes required can be incorporated into the current year procedures.

Key Task – Annual NGER Review

Given the likely changes in the NGER documentation in the short term and changing activities on site and within the group generally it is recommended that an annual review of the NGER reporting requirements is undertaken.

The reporting tool, OSCAR, is also likely to change and should be reviewed prior to reporting. In the first year, several amendments were made during the reporting process that had a material effect on reporters and while such major changes are less likely in the next reporting period it is prudent to keep up-to-date.

9 Reporting to Government

9.1 Registration

Corporations with an NGER reporting obligation are required to register with the Department of Climate Change. A corporation will need to:

- Identify the members of the corporate group and nominate an entity responsible for joint ventures or partnerships, if applicable;
- Prepare a registration form using the NGER registration application tool and the NGER registration user guide;
- Print the completed form and have it signed by the Chief Executive Officer; and
- Post it to the Greenhouse and Energy Data Officer before the due date of 31 August following the reporting period.

9.2 What information is required for registration?

The following information is required:

- The Australian Business Number (ABN), head office street address and head office postal address of the controlling corporation;
- The first financial year in which a reporting threshold is met (e.g. 2009-10);
- The full name, email address, contact phone number and postal address of the controlling corporation's Chief Executive Officer or equivalent; and
- The name and ABN of each affected group member (corporate subsidiary, joint venture and partnership) that is a member of the controlling corporation's group.

The following information can also be voluntarily disclosed:

- The full name, email address, contact phone number and postal address of someone to act as the primary contact person for the controlling corporation. Otherwise the CEO will be the contact person;
- A web address to be included on the public register for the controlling corporation and its group; and
- Whether the controlling corporation or any members of its group are also members of Greenhouse Challenge Plus or the Energy Efficiency Opportunities program.

Once the registration form has been submitted, the DCC verify the application and add the controlling corporation’s name to the National Greenhouse and Energy Register. Part or all of the Register may be published at the GERO's discretion. The current register is available at:

http://www.climatechange.gov.au/government/initiatives/national-greenhouse-energy-reporting/nger-register.aspx

During the first reporting year (2008-2009), the registration process took considerable time and therefore it is recommended that registration forms are submitted well ahead of the due date.

Key Task - Registration

The due date for registration for the next reporting period is 31st August 2010

If a company has changes to its 'affected group members' as a result of acquisitions or divestments, these changes should be communicated to the DCC. There is currently no formal procedure to follow, an annual email, where required, should be sent to the DCC.

9.3 Reporting using OSCAR

Once the registration process is complete, the primary contact person will receive a login and password for OSCAR. Access to OSCAR enables reporters to begin the process of NGER reporting.

Further information on registration and OSCAR is available at:

http://www.climatechange.gov.au/government/initiatives/oscar.aspx

9.4 Lodgement

After all the necessary data has been entered into OSCAR, the NGER report must be lodged with the DCC. The lodgement process requires that Part B of NGER Report (generated from OSCAR) is electronically submitted and that Part A is printed, signed by the CEO (or equivalent) and posted to the Department.

Key Task - Reporting to Government

The due date for lodgement is 31st October after the reporting period, e.g. energy and emissions for July 2009 to June 2010 will be 31st October 2010.

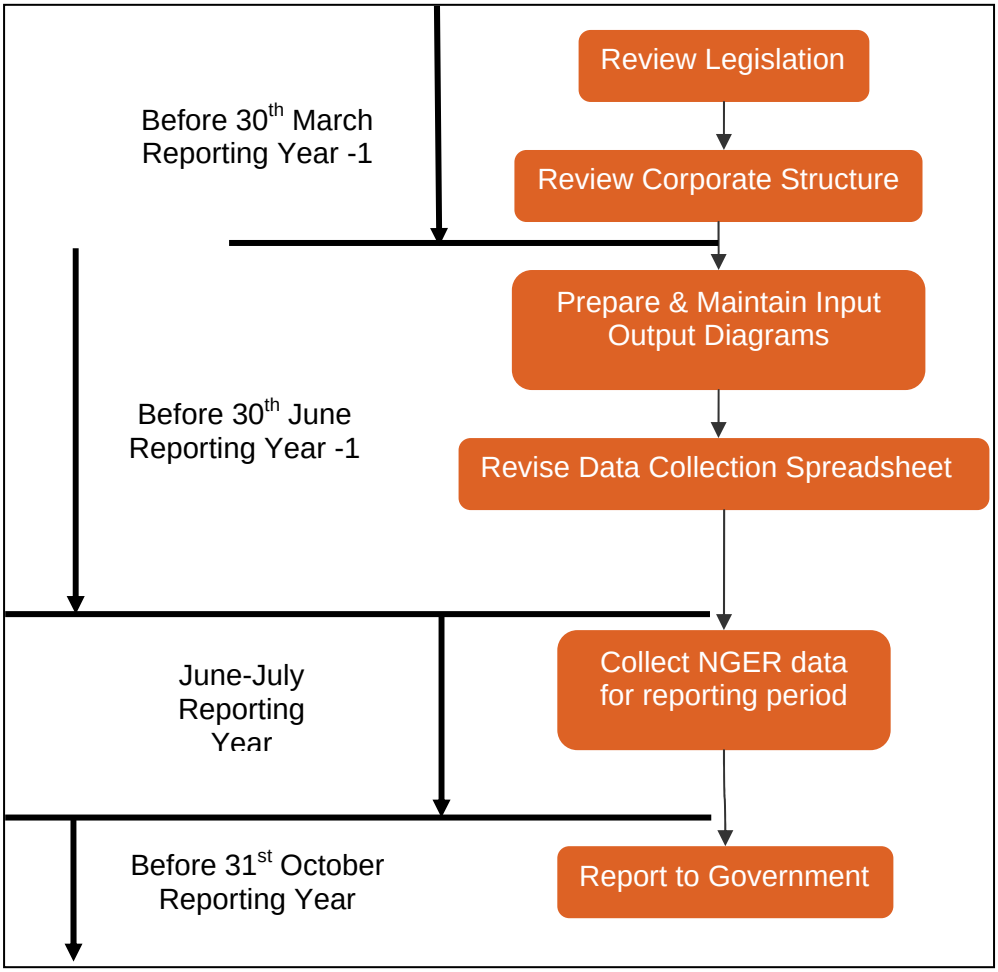
Appendix A. Glossary

Acronym	Definition
COD	Chemical Oxygen Demand
CPRS	Carbon Pollution Reduction Scheme
DCC	Department of Climate Change
GERO	Greenhouse Energy Reporting Officer
GHG	Greenhouse Gas
GJ	Gigajoule, 10^9 Joules
GWh	Giga Watt Hour, 10^6 kWh referring to electricity consumption
GWP	Global Warming Potential
HV	High voltage
KL	Kilolitre, 10^3 litres
NMA	National Meats Australia, the fictional company being used to illustrate the concepts of NGER in the worked examples
NGER	National Greenhouse & Energy Reporting (Act)
OSCAR	Online System for Comprehensive Activity Reporting
SF_6	Sulphur Hexafluoride, a gas used in high voltage switch gear which has a very high Golbal Warming Potential
THSCW	Tonnes of hot standard carcass weight
TJ	Terajoules, 10^{12} Joules
tCO_2-e	Tonnes of Carbon Dioxide Equivalence

Appendix B. Energy & Greenhouse Management System

Controlled Document Environment 401v1.0 **1st**
April 2009

National Meats Australia (NMA) recognises its impact on the environment and is committed to ensuring compliance with the Federal Government's National Greenhouse & Energy Reporting (NGER) legislation. The annual process to be followed is illustrated below:



Task 1 - Review Legislation

It is the responsibility of the Environmental Coordinator of NSW Beef Packers to review the documents associated with the NGER scheme. These include:

- The Act & any amendments;
- The Regulations and any amendments; and
- The Determination and any amendments.

A written report on the outcome of the review will be circulated to the following individuals outlining the potential impact of any changes; Financial Controller, Head Environment and the Head of Maintenance.

This review will take place before 1st April one year prior to the reporting period. **Controlled Document Environment 401 Energy & Greenhouse Management System** will be revised in light of this review.

Task 2 - Review Corporate Structure

Controlled Document Finance (CDF) 101, Corporate Structure, will be reviewed by the Financial Controller and the Environmental Coordinator after the results of the review of the legislative documents are known, and before 31st May each year. This is to ensure all appropriate activities have been included within the data collection for the next reporting period. All acquisitions and disposals for the year are to be identified and the location of documentation supporting these events should be noted. This will generate the list of reportable facilities, sites and activities. The current list is located at the New South Wales Beef Packers Processing Site, Lighting Ridge, New South Wales.

This structure should be updated in the government's online reporting tool OSCAR on completion of this review.

Task 3 - Review & Preparation of Input Output Diagrams

The Environmental Controller shall, with the assistance of appropriate site personnel, prepare or maintain Input Output diagrams for facilities, sites or activities as itemised in Task 2. These are to be prepared in line with the outcomes of Task 1, with respect to reportable emissions sources and Task 2 with respect to operational control. The current version of the Input Output Diagram is Controlled Document Environment 451-Input Output Diagram for NSW Processing Site.

Task 4 Revise Data Collection Spreadsheet

The Environmental Controller shall maintain a spreadsheet for the collation of the necessary data as identified in Task 3. This will include the appropriate methodologies for energy and emissions calculations in line with the results of the review conducted in Task 1. The current spreadsheet for the preparation for National Meat Australia's inventory is Q:/Environmental Compliance/NGER/Inventory Calculator.xls

Appropriate data will be itemised on the Controlled Document Environment 102 NGER Data Register.

Task 5 Collect NGER Data for reporting Period

The identified data will be collated by the Environmental Controller. The Coordinator may delegate data entry where he sees fit but is ultimately responsible for the data accuracy and completeness. Demonstrations of data completeness checks and reconciliation with other data systems should be documented and maintained. Records of calibration of measurement equipment should be maintained.

Task 6 Report to Government

The Government requires reporting of the energy and greenhouse inventory to its online reporting tool, OSCAR. This is available at:
https://www.oscar.gov.au/
Login: National Meats
Password MEAT4T
Reporting is to be completed by 31st October each year.

NGER Legislative Documentation Review

Conducted by: Ann Green, Environmental Expert Consultants in association with Paul Smith, Environmental Controller

Conducted with respect to the following documents available at http://www.climatechange.gov.au/reporting on the 1st April 2010.

- National Greenhouse and Energy Reporting Act 2007[13];
- National Greenhouse and Energy Reporting Regulations 2008[14]; and
- National Greenhouse and Energy Reporting (Measurement) Determination 2008[15].

Please see attached report from Environmental Expert Consultants

Outcomes:

No material changes required to corporate structure rules. Standard revision of corporate structure to incorporate acquisitions and disposals for 2009 to be conducted.

- No material changes to List of reportable emissions; and
- No material changes to Regulations.

Changes to the Determination

Emission factor changes for the following:

- Method 1 Diesel transport fuel; and
- Method 2 Treatment for anaerobically treated waste water

These are to be incorporated into the Emissions calculation spreadsheet by the Environmental controller

Next Review Due: 1st April 2011.

[13] As amended 16th October 2009

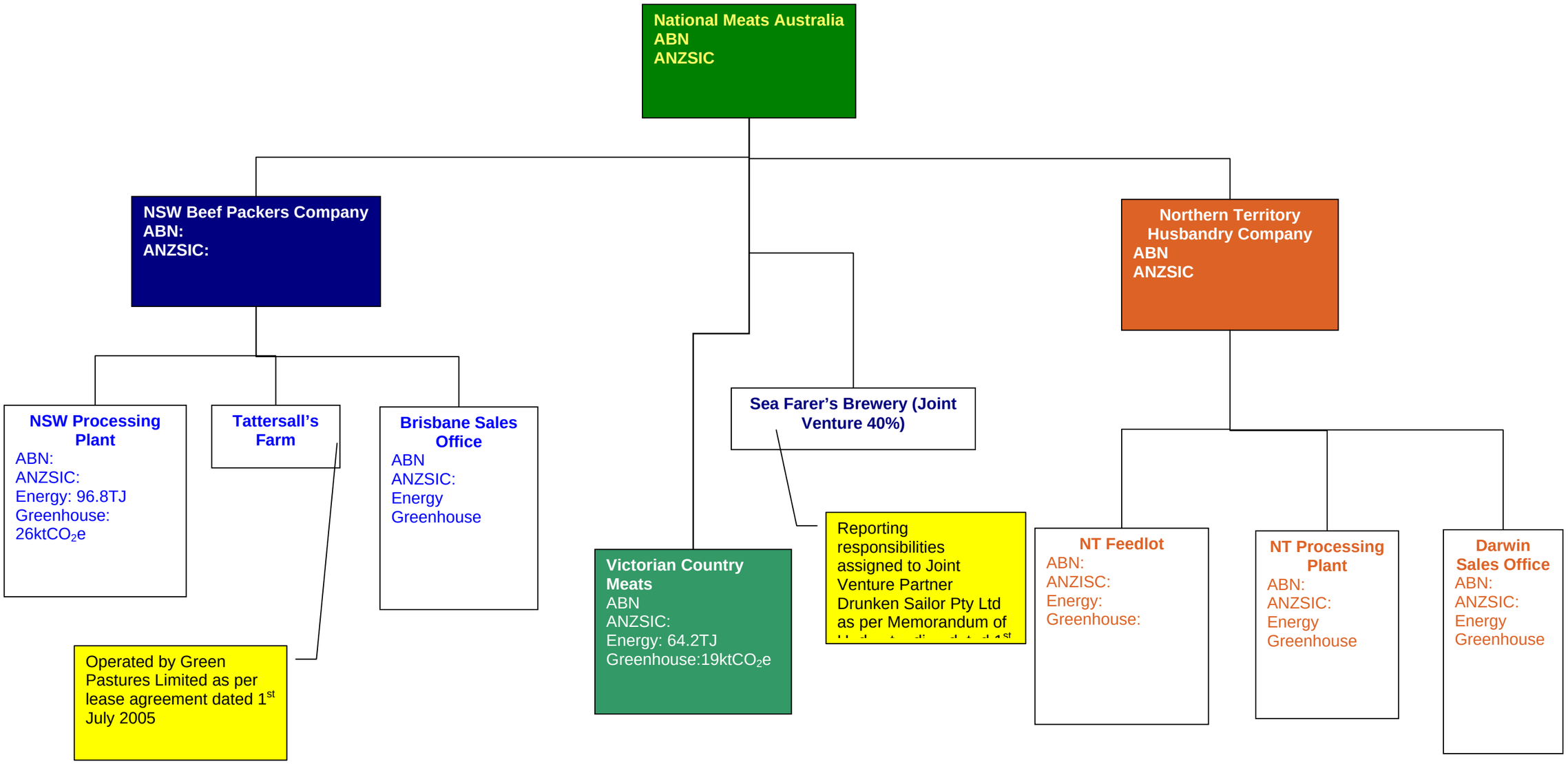
[14] As amended 15th March 2009

[15] As amended 27th June 2009

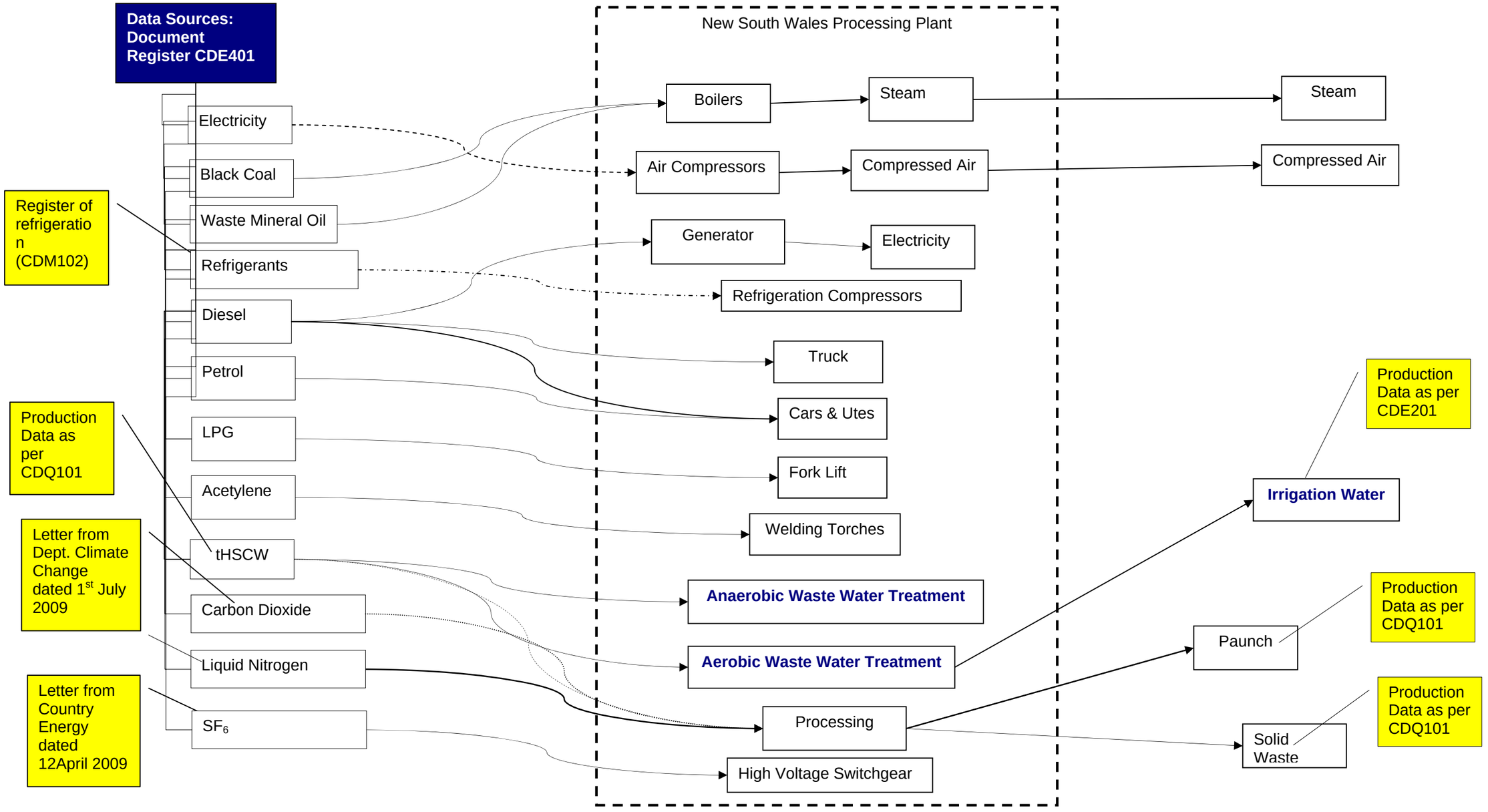
Corporate Structure

Controlled Document Finance 101v1.0
Prepared by: Bill Smith, Financial Controller

Prepared on 1st April 2009



NSW Processing Site Input Output Diagram



Appendix C. NGER Data Register

Controlled Document Environment 102v1.0 **20th January 2009**

Record Name	Record Source	Location	Ledger Code	Access	Record Actions	Action Personnel
Electricity 08-09.xls	Monthly Invoice	Accounts	12345	Hardcopy: Cabinet 4, Draw 2	Monthly data input Reconciliation against meter readings	Louise (accounts)
Black Coal	Weekly delivery dockets	Accounts	13456	Hardcopy: Cabinet 4 Draw 2		Louise (accounts)
Waste Mineral Oil	Monthly delivery docket	Accounts	11458	Hardcopy: Cabinet 4 Draw 2		Louise (accounts)
Diesel	Monthly Invoice	Accounts	21461	Hardcopy: Cabinet 4 Draw 2		Louise (accounts)
Petrol	Fuel Card	Accounts	21462	Hardcopy: Cabinet 4 Draw 2		Louise (accounts)
LPG	Monthly delivery docket	Accounts	21463	Hardcopy: Cabinet 4 Draw 2		Louise (accounts)
Acetylene	Periodic delivery docket	Maintenance	54163	Hardcopy: Cabinet 1 Draw 1		Steve (Engineering Inventory)
Refrigerants	Periodic delivery docket	Maintenance	54164	Hardcopy: Cabinet 1 Draw 1	Please ask supplier to itemise when servicing Chiller #10	Steve (Engineering Inventory)
Production Data	Production Report	Production	10001		As per Quality Manual Section 1.01	Shift manager
Solid Waste	Monthly delivery docket	Environment	44110	Environmental Compliance Files Shelf	As per EMS section 4.01	Environmental Coordinator

Record Name	Record Source	Location	Ledger Code	Access	Record Actions	Action Personnel
Paunch	Monthly delivery docket	Environment	44111	Environmental Compliance Files Shelf	As per EMS section 4.01	Environmental Coordinator
Irrigation Water	Monthly delivery docket	Environment	44112	Environmental Compliance Files Shelf	As per EMS section 4.01	Environmental Coordinator

Appendix D. Refrigeration Survey

Controlled Document Maintenance 102v1.0 **20th January 2009**
Survey Conducted By: Charles McGregor, Site Engineer
Survey conducted on date: 5th April 2009

Asset Name	Description	Location	Refrigerant	Charge
Compressor Chiller #1	Carrier 150kW	Chiller Room Compressor	R404a	90kg
Compressor Chiller #2	Carrier 150kW	Chiller Room Compressor	R404a	90kg
Compressor Chiller #3	Carrier 150kW	Chiller Room Compressor	R404a	90kg
Compressor Chiller #4	Carrier 150kW	Chiller Room Compressor	R404a	90kg
Compressor Chiller #5	Carrier 150kW	Chiller Room Compressor	R404a	90kg
Compressor Chiller #6	Carrier 150kW	Chiller Room Compressor	R404a	90kg
Compressor Chiller #7	Carrier 150kW	Old Boiler House	R404a	90kg
Compressor Chiller #8	Carrier 150kW	Old Boiler House	R404a	90kg
Compressor Chiller #9	Carrier 150kW	Old Boiler House	R404a	90kg
Compressor Chiller #10	Carrier 300kW	Old Boiler House	R404a	180kg
High Side Compressor #1	Stal 350kW	Engine Room #1	Ammonia	
High Side Compressor #2	Mycom 250kW	Engine Room #2	Ammonia	
High Side Compressor #3	Grasso 250kW	Engine Room #1	Ammonia	
Low Side Compressor #1	Stal 300kW	Engine Room #1	Ammonia	
Low Side Compressor #2	Stal 200kW	Engine Room #1	Ammonia	
Low Side Compressor #3	Mycom 300kW	Engine Room #2	Ammonia	
Low Side Compressor #4	Mycom 350kW	Engine Room #2	Ammonia	

Appendix E. Record Keeping Policy

The purpose of the National Meats Australia Energy and Greenhouse Information Management System (EGIMS) is to enable compliance with the *National Greenhouse and Energy Reporting Act* (NGER Act). The EGIMS will inform the development of the annual NGER inventory, which captures all emissions resulting from activities under our operational control.

The records that support the EGIMS form a significant component of its corporate memory. The records are a vital asset that support ongoing operations, and provide valuable evidence and essential supplementary background for emissions related activities over time.

ABC Meat Corp. is committed to implementing best practice record keeping systems to ensure the creation, maintenance and protection of accurate and reliable records.

This policy applies to all employees who are involved with the NGER data collection processes. The policy applies to all aspects of business, all records created to support emissions calculations, and all applications used to develop and maintain records including email, database applications and websites.

- National Meats Australia will implement and operate suitable document record keeping processes in line with the Australian standard ISO 15489;
- All documentation will be periodically reviewed and approved by appropriate personnel;
- The identification of documents will be consistent with the Record Keeping Procedures;
- An operational Register of Records will be used to ensure that all records are managed and maintained in a consistent manner;
- All records will be maintained for a period of 7 years;
- National Meats Australia will utilise the most appropriately trained personnel at all times to produce high quality records; and
- National Meats Australia will actively participate in audits to identify any potential areas for improvement and to ensure that the internal systems and procedures adequately address and adhere to NGER record keeping requirements.

All practices with regards to the EGIMS record keeping within National Meats Australia are to be in accordance with this policy and its supporting procedures.

Contact Details

Brisbane
Unit 3, 212 Boundary Street, Spring Hill QLD 4000
Ph: +61 7 3230 8800
Fax: +61 7 3230 8811

Canberra
G01 86-88 Northbourne Ave, Braddon ACT 2612
PO Box 5119, Braddon ACT 2612
Ph: +61 2 6257 9864
Fax: +61 2 6247 9841

Melbourne
Level 8, 446 Collins Street, Melbourne VIC 3000
PO Box 652, CSW Melbourne VIC 8007
Ph: +61 3 9602 5511
Fax: +61 3 9602 5599

Perth
Level 4, 172 St Georges Tce, Perth WA 6000
Ph: +61 8 9429 6400
Fax: +61 8 9429 6411

Sydney
Level 7, 132 Arthur Street, North Sydney NSW 2060
PO Box 294 North Sydney NSW 2059
Ph: +61 2 9929 3911
Fax: +61 2 9929 3922

WEB: http://www.energetics.com.au
E-MAIL: info@energetics.com.au