



Greenhouse Gas & Energy Efficiency Management Plan





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1. Introduction

1.1 Purpose

The purpose of this Greenhouse Gas & Energy Efficiency (GHG&EE) management plan is to outline the process in place by which on site energy use is managed to comply with PKCT policy and legislative requirements.

Legislative requirements include the Department of Planning and Infrastructure's (DPI's) approval 08_0009 (refer Section 5.2 herein).

The Plan also aligns with the following:-

- PKCT's Sustainable Development and Environment Policies.
- Obligations under the Department of Energy, Utilities and Sustainability, 2005, Guidelines for Energy Savings Action Plans. Currently, the regulator is the NSW Office of Environment and Heritage (OEH).
- Obligations under the National Greenhouse and Energy Reporting Act regulated by the Department of Climate Change and Energy Efficiency (DoCC) (federal).

1.2 Background

PKCT provides a coal and bulk products receipt, storage and ship loading service to customers whom predominantly constitute mining companies in the NSW Southern and Western Coal Fields. PKCT is located on northern side of the port of Port Kembla Inner Harbour and operates on land leased from the Port Kembla Port Corporation.

PKCT has been operating since August 1990 and has an Office of the Environment and Heritage Environment Protection Licence (EPL) number 1625.

In June 2009, the DPI set new approval conditions for PKCT's operations as part of the development consent under Part 3A of the Environmental Planning & Assessment Act 1979 for PKCT's Existing Operations & Increased Road Receipt Hours Major Development application (08_0009). This consent includes a requirement for a GHG&EE Management Plan to be submitted to, and approved by, the DPI Director-General.

A Greenhouse Gas and Energy Efficiency Plan MP.HS.461 Version 3.0 was submitted to the DPI on the 29th July 2010 as part of PKCT's 0910 Annual Environment Management Report submission.



1.3 Scope

This management plan applies to PKCT's premises and activities associated with greenhouse gas emissions and energy efficiency (GHG&EE) in the operation of PKCT's on site equipment.

PKCT emits very small amounts of direct (Scope 1) greenhouse gas (GHG) emissions as the majority of its equipment is powered by electricity generated off site (Scope 2 GHG emissions). Therefore, the scope of this management plan is to identify opportunities to reduce the small amounts of Scope 1 emissions and minimise electricity use through energy efficient operations.

2. Objectives

The objectives of this management plan are to:-

- Comply with all regulatory and corporate requirements relating to GHG&EE.
- Define the roles and responsibilities with respect to GHG&EE.
- Provide an overview of PKCT energy usage and associated GHG emissions.
- Outline the processes in place for the identification and implementation of reasonable and feasible measures to minimise energy (electricity) use and GHG emissions at PKCT's premises.
- Provide a methodology and program to estimate/monitor GHG emissions and energy use generated by PKCT's operations.
- Outline how minimisation measures will be monitored over time.
- Provide GHG&EE data for the PKCT's Annual Environmental Management Report (AEMR) and other reporting.

3. References

The following documents are relevant to this management plan:

- Australian Federal Government, 2007, National Greenhouse and Energy Reporting Act 2007
- Australian Federal Government, 2008, National Greenhouse and Energy Reporting Regulations 2008
- Department of Energy, Utilities and Sustainability, 2005, Guidelines for Energy Savings Action Plans
- [DPI Project Approval 08_0009](#)
- GHD, 2009, PKCT National Greenhouse and Energy Reporting Review Final Report
- PKCT Energy Savings Action Plan 2006 (Energetics)
- PKCT Environment Management Strategy MP.HS.464

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4. Responsibilities

The following table identifies roles and responsibilities for PKCT GHG&EE.

Table 4.1 – PKCT GHG&EE Roles & Responsibilities

Area	Action	Responsibility
PKCT Energy Savings Action Plan	Establishing, evaluating and implementing initiatives Maintenance of the Energy Savings Action plan and associated regulatory reporting (OEH)	Electrical Maintenance Engineer
PKCT GHG&EE Management Plan	Maintenance and communication of the plan	Risk Manager
GHG&EE Monitoring & Reporting	Reporting to PKCT Management Regulatory reporting (DPI, DoCC)	Risk Manager
Site Operations	Ensure plant is operated efficiently and ensure energy savings are considered when making operational changes.	Operations Manager
Asset Management	Ensure equipment is maintained and operating efficiently and consideration is given to energy savings in upgrades and when undertaking changes.	Engineering Manager
Training & Awareness	Ensuring staff and contractors are aware of initiatives.	Risk Manager

5. Legislative and Other Requirements

5.1 Legislation

The National Greenhouse and Energy Reporting (NGER) Act 2007 and the National Greenhouse and Energy Reporting Regulations 2008 are the Australian Federal Government's current legislative requirement in relation to GHG&EE applying to PKCT. This Act and Regulation require large GHG emitters or energy consumers to report the extent of emissions and energy use to the Federal Government. As explained on the Federal Government's [Department of Climate Change and Energy Efficiency](#) website, the information collected under the NGER requirements will:

- Underpin the Carbon Pollution Reduction Scheme
- Inform government policy formulation and the Australian public
- Help meet Australia's international reporting obligations
- Assist commonwealth, state and territory government programs and activities

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- Avoid the duplication of similar reporting requirements in the states and territories (<http://www.climatechange.gov.au/business/obligations.aspx>)

The Act makes it mandatory for corporations to submit an annual report on energy use and green house gas emissions from operations, where energy use or emissions exceeds certain thresholds.

In reviewing requirements under the Act, PKCT has determined that PKCT is the reporting entity on the basis of having operational control of the facility.

Consultant, GHD, undertook an NGER review of PKCT's operations in August 2009 and provided advice on PKCT's reporting responsibilities under the NGER Act and Regulation. The conclusion of the GHD 2009 NGER Review was that, based on 2008-09 GHG emissions and electricity usage, PKCT does not meet the lower threshold for reporting. An assessment of energy usage for 2008/09 financial year indicated that energy consumption and greenhouse gas generation was 83% and 77% of the facility threshold.

Ongoing monitoring of electricity usage levels will be undertaken, however, with consideration to increased or changing activity and possible growth in coal throughput at PKCT. If the threshold is reached, the associated regulatory reporting required under the NGER Act will be initiated.

5.2 DPI 2009 Development Consent

The following extract from the Part 3A development consent identifies PKCT requirements:

GREENHOUSE & ENERGY EFFICIENCY

Operating Conditions

17. The Proponent shall implement all reasonable and feasible measures to minimise:

- (a) energy use on site; and
 - (b) greenhouse gas emissions from the project
- to the satisfaction of the Director-General.

Greenhouse and Energy Efficiency Plan

18. Within 12 months of this approval or as otherwise agreed by the Director-General, the Proponent shall prepare and implement a Greenhouse and Energy Efficiency Plan for the project. This plan must:

- a) be prepared generally in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS 2005, or its latest version);
- b) be submitted to the Director-General for approval;



- c) include a program to estimate/monitor greenhouse gas emissions and energy use generated by the project;
- d) include a framework for investigating and implementing measures to reduce greenhouse gas emissions and energy use at the project;
- e) describe how the performance of these measures would be monitored over time; and
- f) report on the project's greenhouse gas emissions and minimisation measures in the AEMR to the satisfaction of the Director-General.

5.3 Policies and Standards

PKCT has a management system in place which operates in accordance with the following:

- PKCT has been operating in accordance with their Energy Savings Action Plan since 2006 and this remains in operation.
- PKCT's Sustainable Development Policy which is supported by its Environment and Quality policy (refer www.pkct.com.au)
- BHPBilliton Environment Standard (GLD.009)
- PKCT has an environment management system in place which is certified to AS/NZS ISO 14001. The system includes documented policies and procedures, environmental aspects assessed and registered with processes for their control and continual improvement. The system is subject to audit and review including biannual surveillance visits by PKCT's external certifier.

6. Management Strategies

6.1 Operational Activities and Potential Issues

Identification of GHG emissions occurs via definition into three 'Scopes' (categories) to allow suitable reporting and comparison between different emitters and different locations.

These are:

- **Scope 1** – includes direct emissions from sources within the boundary of an organisation such as fuel combustion and manufacturing processes
- **Scope 2** – includes indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation. Scope 2 emissions result from the combustion of fuel to generate electricity, steam, or heat and do not include emissions associated with the production of fuel. Scopes 1 and 2 are carefully defined to ensure that two or more organisations do not report the same emissions in the same scope.



- **Scope 3** – includes all other indirect emissions that are a consequence of an organisation's activities but are not from sources owned or controlled by the organisation. Examples of Scope 3 emissions include indirect emissions associated with the extraction/production of fuels used on site, fuel extraction and line loss associated with the consumed electricity, transport of product outside the organisation and emissions associated with end use of product.

There are six reportable GHG under NGER of which three, carbon dioxide, methane and nitrous oxide, are associated with PKCT operations. All emissions are reported as tonnes of carbon dioxide equivalent (t CO₂-e).

GHD's 2009 NGER review included a review of PKCT's GHG emissions and electricity use. The data obtained for this review provides background for this management plan.

The 2009 NGER Review identified the following activities that result in GHG emissions from PKCT operations.

Table 6.1 – PKCT Activities that Generate GHG Emissions

Reportable Activity	PKCT Activity
<i>Consumption of Liquid Fuels</i>	
Diesel	Front-end loaders
Petrol	Site vehicles
Petroleum based oils	Vehicle & equipment maintenance
Petroleum based gases	Vehicle & equipment maintenance
<i>Consumption of Gaseous Fuels</i>	
Acetylene	Welding
<i>Fugitive Emission Sources</i>	
Wastewater handling	2 small septic systems at PKCT premises
<i>Electricity</i>	
Purchased electricity	Used to power on site machinery

The 2009 NGER Review goes on to identify the GHG emissions from PKCT operations as shown in the following table.

Table 6.2 – PKCT Energy Use and GHG Emissions

	Energy Use (GJ)	GHG Emissions (t CO ₂ -e)
Electricity	75,661.4	18,705.2
Diesel oil (stationary energy)	6,085.1	422.9

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Petrol (transport)	990.3	68.9
Other gaseous fossil fuels (acetylene)	2.0	0.1
Petroleum based oils	232.2	6.5
Petroleum based greases	226.3	6.3
Wastewater treatment	-	2.8
Total 2008-09	83,197	19,213

The methodology for the calculation of these energy use and GHG emissions figures are contained in the GHD 2009 NGER Review Report (referenced in Section 3).

Electricity use results in the largest GHG emission. This is created by power stations during generation and is a Scope 2 PKCT emission. The other items in Table 6.2 are all Scope 1 PKCT GHG emissions. This results in the following PKCT Scope 1 & 2 GHG emissions.

Table 6.3 – PKCT Scope 1 and 2 GHG Emissions

PKCT GHG Emission Scope	GHG Emissions (t CO ₂ -e)	% of Total GHG Emissions
Scope 1	507.5	2.6%
Scope 2	18,705.2	97.4%

6.2 Environmental Aspects and Impacts

This management plan aims to minimise impacts associated with GHG emissions from PKCT's operations. The majority of GHG emissions associated with PKCT are Scope 2 from electricity generating power stations. As these are located away from PKCT, the proposal to reduce electricity use will have a greater localised impact in the area surrounding the power station.

The general aim of this GHG&EE Management Plan is to work with the Federal Government to reduce Australian GHG emissions through major emitters or energy users undertaking mitigation or reduction measures. The goal is to have a measurable result of a reduction in environmental impact associated with GHG emissions across Australia.

6.3 Management and Mitigation

Responsibilities under this management plan are listed in Section 4 herein. Site personnel shall ensure that equipment is operated efficiently and maintained at optimum efficiency and look for improvement opportunities and measures to reduce electricity usage and greenhouse gas consumption.



6.4 Management Strategy, Effectiveness and Improvement

6.4.1 Management Review

Management reviews are primarily undertaken as follows:-

- Business Planning- 5 year strategic and annual business plans (financial year) developed identifying improvements projects; inputs may include data from risk assessments, audits, legal compliance evaluation, SWOT analysis, stakeholder feedback, environmental incidents.
- Business Management System Reviews- quarterly system reviews. Inputs include legal compliance, ISO14001 and environmental matters.
- Energy Savings Action Plan- quarterly reviews. Actions in the plan are tracked using PKCT's event management system. Significant improvements are developed as projects through PKCT's project framework and capital works program.

6.4.2 Energy Savings Action Plan

Effectiveness and the need for improvement may be determined by management reviews (refer Section 6.4.1) or at an operational level through site observations, incidents, as monitoring data becomes available or through the annual reporting process.

To minimise Scope 1 and Scope 2 GHG emissions, PKCT has an Energy Savings Action Plan (ESAP) in place. It was initially prepared in 2006 by consultant, Energetics, and included a baseline energy assessment, an energy management review and a review of efficiency opportunities. The ESAP is revised annually. The 2011 ESAP Plan includes investigation into Scope 1 GHG emissions and reduction opportunities.

PKCT's ESAP has been prepared based on the Department of Energy, Utilities and Sustainability publication 'Guidelines for Energy Savings Action Plans 2005'. The GHG emission investigations are being undertaken in accordance with the guidelines.

The strategy in this GHG&EE Management Plan is based on the following activities which are consistent with the approach in the Guidelines for Energy Savings Action Plans:

1. Identify on site activities that result in GHG emissions.
2. Identify the Terminal's baseline electricity use.



3. Management review of PKCT activities that result in GHG emissions and high electricity use.
4. Identify PKCT staff to be involved in the review.
5. Identify opportunities to reduce GHG emissions from on site activities.
6. Identify opportunities to reduce electricity use.
7. Formalise the activities to minimise GHG emissions and electricity use in a management plan which sets out how these will be implemented, monitored and improved (where necessary).

Items 1– 7 are complete through PKCT's Energy Savings Action Plan supported by this management plan and the GHD 2009 NGER Review report. PKCT will continue to implement the investigation framework to identify opportunities for reduction of electricity usage contained in Section 3 of the PKCT ESAP.

PKCT has a very low level of Scope 1 GHG emissions, therefore there are only limited opportunities for reduction. The potential opportunities for reducing Scope 1 GHG emissions are:

1. Reduce diesel and petrol use by PKCT vehicles through efficient use of these fuels, achieved by only running vehicles when necessary and turning off engines during prolonged periods of vehicle inactivity.
2. Ensure efficient use of oils and gases during vehicle maintenance to reduce any possibility for overuse of these products.
3. Ensure efficient use of acetylene by using experienced welders to undertake work to minimise time taken and amount of acetylene used.
4. Reduce fugitive GHG emissions associated with wastewater handling through improvement to PKCT water management system. Undertake a system review to identify inefficiencies and opportunities for improvement.

7. Monitoring

7.1 General

Monitoring of GHG emissions and electricity use is necessary for reporting to the Federal Government under the NGER Act. Section 7.2 indicates how this will be undertaken.

Usage monitoring, combined with comparison of previous monitoring results, will assist in identifying the energy usage characteristics of PKCT's operations, possible improvement



opportunities and evaluating the success of measures to reduce emissions and electricity use.

7.2 Electricity Use Monitoring

PKCT receives detailed monthly electricity bills that identify PKCT's usage. The transfer of this data into a spreadsheet allows easy access and manipulation into charts and tables showing use over time.

Monitoring undertaken since 2006 for the PKCT ESAP remains available for comparison purposes. This historical information and current electricity usage details from ongoing electricity bills will be used to compare usage for pre and post implementation of reduction measures wherever possible. This will allow identification of the performance of electricity reduction measures over time.

7.3 GHG Emissions Monitoring

The GHD NGER Review identifies the extent of PKCT's on site activities that generate GHG emissions. Table 6.1 of this management plan provides a summary of these. The GHG emissions associated with the use of the diesel, petrol, oils and gases is calculated based on the amount of the item used. PKCT has information on the amount of these products purchased and the regularity of these orders. The gathering and interpretation of this information allows calculation of GHG emissions from Scope 1 activities.

Scope 2 GHG emissions are monitored based on electricity data collected for the usage monitoring as a calculation of these emissions is based purely on the amount of electricity used.

The performance of activities to reduce GHG emissions is monitored by comparing historical GHG emission calculations with recent calculations undertaken after implementation of the strategies. Section 4.3 of the NGER Review reports identifies a methodology for monitoring GHG emissions and electricity use.

Table 9 below is an extract from the NGER Review showing the methodology which has been implemented.



Table 9: Process to calculate reportable energy use and greenhouse gas emissions

		A	B	C	D	E
Scope 1 – direct emissions						
	Reporting unit	Amount consumed (reporting unit)	Energy content (GJ per reporting unit)	Emissions factor (kg CO ₂ -e per GJ)	Reportable energy (GJ)	Reportable emissions (tonnes CO ₂ -e)
Diesel oil(transport)	kL		38.60	69.90	A x B	A x B x C / 1000
Diesel oil(stationary energy)	kL		38.60	69.50	A x B	A x B x C / 1000
Petrol(transport)	kL		34.20	69.60	A x B	A x B x C / 1000
Petroleum based oils	kL		38.80	27.90	A x B	A x B x C / 1000
Petroleum based greases	kL		38.80	27.90	A x B	A x B x C / 1000
Acetylene	m ³ *		0.0393	51.33	A x B	A x B x C / 1000
Scope 2 – indirect emissions						
	Reporting unit		Energy content (GJ per kWh)	Emissions factor (kg CO ₂ -e per kWh)		
Electricity	kWh		0.0036	0.89	A x B	A x C / 1000

* gas measured at standard temperature and pressure

(Source: GHD, 2009, National Greenhouse & Energy Reporting Review, Final Report)

8. Reporting and Review

8.1 Monitoring Data

Monitoring data is captured and retained for analysis and reporting activities. PKCT's Business Services section stores this electronically and makes it available to appropriate staff.

8.2 Preventative and Corrective Actions

PKCT is quality certified to AS/NZS ISO 9001:2004 and AS/NZS ISO 14001:2008. This standards set out requirements for the identification of preventative and corrective actions which pertain to this management plan. Processes include risk assessments, audits and incident investigation and site observations.

The Risk Manager shall review monitoring data annually to ensure consistency in collection, storage and analysis as part of the preparation of Annual Environment Management Report. A 3 yearly external audit checking compliance against the DPI Approval 08_0009 also forms part of PKCT's audit program.

In the event errors are identified through audits or other means, errors shall be investigated and appropriate corrective measures identified and implemented.



8.3 Reporting

In accordance with the responsibilities outlined in Section 4 herein, reports shall be prepared and submitted to the regulators by the due date. Key reports are as follows:-

- Report to Department of Planning and Infrastructure by 31st July as part of the Annual Environment Management Report
- PKCT Energy Savings Action Plan Report: Annual Progress report to the Office of Environment and Heritage; due 30th June, normally submitted 31st July so that June figures can be included.
- If reporting threshold is reached: NGRS report to the Department of Climate Change and Energy Efficiency.

8.4 Review

In accordance with 6.4.1, the Energy Savings Action Plan shall be reviewed at least quarterly. Reviews shall include consideration of greenhouse gas reduction opportunities.

Monitoring data shall be reviewed to identify variations in results, trends and errors. The data review will also seek out trends that indicate changes in the PKCT's GHG emissions or electricity usage to enable assessment of reduction strategies or measures.

9. Complaints Recording and Reporting

PKCT has a 24 hour, 7 day free call community hotline number (1800 11448) or e mail communitylinks@pkct.com.au which is advertised on PKCT website i.e. www.pkct.com.au. This provides a mechanism by which complaints and general enquiries regarding environmental or community issues associated with operational activities can be directed.

PKCT has a Community and Stakeholder Complaints Management process in place which ensures complaints are recorded, registered and investigated. Where appropriate, corrective actions are developed and implemented.

10. Documentation and Control

This management plan is a controlled document in PKCT's Sharepoint Controlled documents library together with other PKCT documents and reports referenced herein.

PKCT has a web based service which enables access to legislation in full and in plain English. This service includes an update facility enabling PKCT personnel to keep up to date with legislative changes.



11. Conclusion

This Greenhouse Gas and Energy Efficiency (GHG&EE) Management Plan describes PKCT's process for monitoring GHG emissions and electricity use and the framework for identification and implementation of electricity use reduction measures.

PKCT's activities to reduce electricity use directly reduces Scope 2 GHG emissions (associated with off-site electricity generation). Consideration is also given to the identification of measures that will reduce Scope 1 and Scope 2 GHG emissions (from on site activities).

In accordance with DPI Project Approval 08_0009 requirements, this management plan combines the GHG emissions and electricity use monitoring and reduction activities and provides for combined future analysis of performance measures and reporting.

This management plan outlines the processes in place to monitor GHG emissions and electricity use and implementation of reduction and efficiency schemes. The performance of these and subsequent alterations in PKCT GHG emissions and electricity use will be documented in the Annual Environmental Management Report.

The monitoring and reporting procedures described in this management plan ensures a suitable work environment is in place at PKCT to foster a desire to be more efficient, to reduce GHG emissions and electricity use with consideration to activity level so that PKCT may contribute to NSW and Australian GHG emission reductions.