



Gladstone Ports Corporation
Growth, Prosperity, Community.

Gladstone Ports Corporation Limited Energy Efficiency Opportunities 3rd Public Report 2009-2010

INTRODUCTION TO THE ENERGY EFFICIENCY OPPORTUNITIES PROGRAM

The Energy Efficiency Opportunities Program (EEO) is an Australian Government initiative to encourage large energy using businesses to improve their energy efficiency by requiring them to identify, evaluate and report publicly on cost effective energy saving opportunities. Gladstone Ports Corporation Limited (GPC) became a signatory to the EEO program in 2006-07.

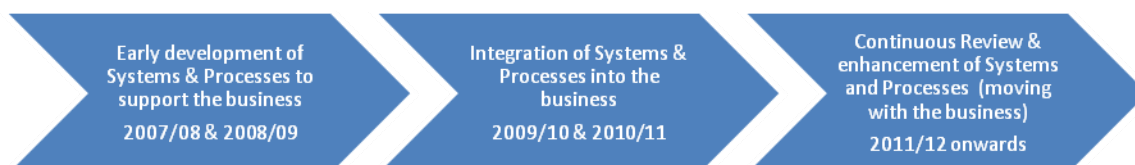
The EEO program is designed to:

- improve the identification and uptake of cost-effective energy efficiency opportunities;
- improve productivity and reduce greenhouse gas emissions; and
- provide greater scrutiny of energy use by large energy consumers.

The Australian Government Department of Resources, Energy and Tourism (DRET) is administering the program under the *Energy Opportunities Act 2006* and its associated Regulations. The Corporations participating in the Energy Efficiency Opportunities Program have already identified opportunities to save 6.4 million tonnes of carbon dioxide equivalent emissions MtCO_{2-e} per year. This is equivalent to 1.1% of Australia's total 2006-07 greenhouse gas emissions. The participants have applied the program's assessment framework to more than half, (57 percent) of their total energy use. Under the program, these Corporations have until 2011 to assess 80% of their total energy use and the energy use of all sites that use greater than 0.5PJ of energy. Please visit www.energyefficiencyopportunities.gov.au for further information.

As part of it's obligations, GPC has submitted an Assessment and Reporting Schedule (A&RS) that has been accepted by DRET for the first five year improvement cycle. The key activities and assessment schedule from the A&RS commitment are shown below.

GPC's timeline of key activities:



Key business Centre Assessments:

- 2007-08 – GPC Administration Building (Yaroon Street)
- 2007-08, 2008-09, 2009-10 & 2010-11 – Marina, RG Tanna Coal Terminal

Business Context:

Since becoming one of the 199 plus mandatory participants in the EEO program, GPC and its Board have embraced the intent of this legislation. This includes providing funding as items in the annual operating and capital budgets, and forming an Energy & Climate Group (ECG) to provide guidance and support in meeting the requirements of the legislation.

Energy & Climate Steering Group:

The ECG was established to provide guidance, support and oversee the various State and Federal Government initiatives in order to ensure that GPC meets its key obligations under the various policies and legislative acts. This replaces the previous EEO Team. The Energy & Climate Group consists of the following members:

- Program Lead: Port Operations - General Manager
- Emissions and Environment Assessment – Health, Safety, Security & Environment Manager
- Financial and Business Assessment – Company Secretary/ Financial Accountant
- Technical Consultant and Energy Initiative Projects – Electrical & Control Specialist
- Program Coordinator – Risk & Insurance Coordinator

Systematic Approach:

The first critical step the program initiated for pursuing energy efficiency outcomes was introduction of the EEO program to our employees. To ensure that a consistent message was given to all employees, a video presentation was produced which covered the following basic areas:

- An introduction to the EEO program and its objectives;
- The energy used by GPC in the financial year 2006-07;
- The EEO team structure and its members;
- The basic steps in performing an assessment and evaluating improvement ideas; and
- A central point for collecting ideas.

The EEO requirements have been incorporated into our Induction Program along with GPC additional reporting requirements under the Energy & Climate Group, to ensure all new employees are aware of GPC obligations under the EEO legislation.

Key systems that are required for the EEO program to become sustainable are currently under development. These systems include:

- A common data repository that will collate the base data from the various systems within GPC. This will allow the reporting requirements for various legislative programs (e.g. National Greenhouse and Energy Reporting System, and National Pollution Inventory) to be met with consistent data.
- A system to enable all employees to register improvement ideas, including those related to energy efficiency opportunities, and to track each idea's progress.

- A system for analysing energy usage and assessing improvement ideas. This system also defines documentation that is required for auditing and the monitoring of implemented ideas to validate the achieved energy efficiency / cost savings.

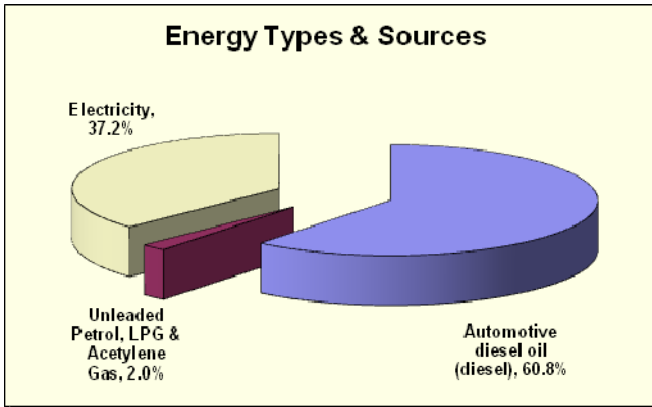
In addition to addressing the current situations within GPC via assessments, the ECG has been working to ensure that energy efficiency is addressed as the business moves forward, for example:

- Energy efficiency clauses have been added into all future equipment tender specifications.
- Energy efficiency considerations have been included in the proposed Capital Investment System to be implemented.
- A comprehensive company policy has been drafted which covers both the Energy Efficiency Opportunities program as well as the National Greenhouse and Energy Reporting System.
- Energy efficient designs are being included in conveyor system electrical upgrades.
- Energy efficiency concepts are being included in the functional descriptions for new control systems.
- GPC's board has adopted the Qld Government QFleet Travel Policy for its fleet vehicles and ensures all new vehicles purchased are compliant with the Greenhouse Vehicle Guide rating stipulated within the policy.
- GPC's board has adopted the Queensland Government Carbon Offsets Air Travel Policy, where GPC purchases offsets for all employee flights.

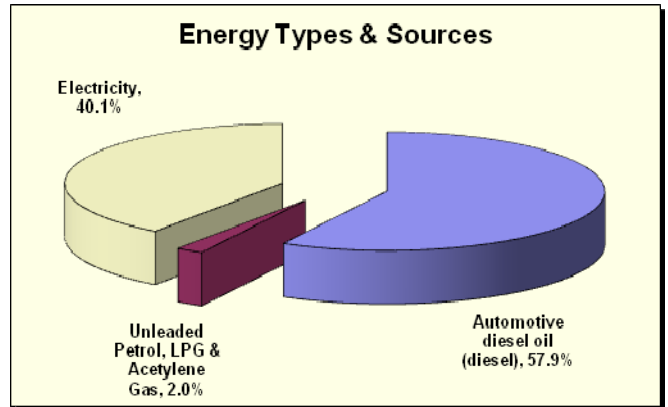
The EEO team has also been involved with the Wiggins Island Coal Terminal (WICT) development team regarding the EEO program requirements. The WICT team established an internal team to consider energy efficiency opportunities during the design phase.

ENERGY USE SINCE GPC'S TRIGGER YEAR 2005 - 2006

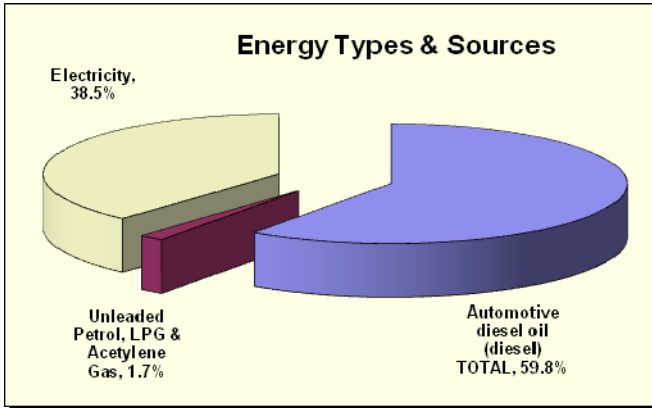
2006-2007



2007-2008



2008-2009



2009-2010

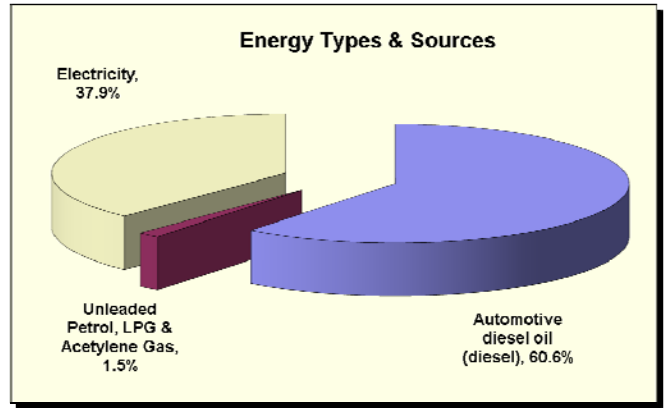


Table 1.1 Summary of energy use since trigger year 2005-2006

	Coal Throughput ^{1,2} (Tonnes)	Total GPC Energy ³ (MJ)	Equivalent Households	Tonnes of CO _{2-e}
2006-2007	51,508,285	640,848,093	12,817	88,160
2007-2008	54,130,361	682,074,432	13,641	97,402
2008-2009	56,202,983	723,257,627	14,465	101,373
2009-2010	60,396,511	764,823,848	15,296	104,832

Notes

1. While GPC also exports other products which consume energy, the primary energy consumer is the exporting of coal.
2. Please note, GPC has adjusted the previous years coal throughput figures.
3. Contractor data for 2009-10 was also collected and has been incorporated into GPC's total energy usage.

SUMMARY OF ASSESSMENTS CONDUCTED 1 JULY 2009 TO 30 JUNE 2010**Assessment process:**

GPC is continuing on-going assessments of several facilities in the 5 year cycle.

On the 1st November 2009 GPC acquired Port of Bundaberg from the Port of Brisbane as part of a Queensland Government directive. Port of Bundaberg has been added to the assessment and reporting schedule, however will be included in the second 5 year cycle.

Table 1.2 provides a summary of the energy use and the assessment status for GPC's business centres.

On-going assessments at the time of reporting:

GPC has been focusing on capturing time-of-use data for RG Tanna Coal Terminal (RG TCT), by installing and configuring ION meters which are now linked to the corporate network. Additional meters are planned to be installed to assist with capturing data at key points within the Terminal. Refer to page 12. Installation of new meters at the Marina and Yarroon Street offices are planned for the coming reporting periods to assist in providing GPC with more detail data analysis.

GPC is still progressing with its main identified opportunity with our dozer fleet, as diesel is still one of GPC's major energy sources. Refer to page 11.

The Process Control System Project Team based at RG TCT has completed Stage 1 and is now entering Stage 2 of a five year project to upgrade the electrical controls and hardware on aging equipment. This included:

- An upgrade on the tunnel lighting systems. CC20 was selected as a conveyor that would under go a major electrical hardware and software upgrade. This included upgrading a full range of hardware controls and network devices as well as a new PLC code and operator interface screens.
- CC10 tunnel lighting system upgrade was completed in August 2010. Further assessment will be conducted during 2010-11 to ascertain the benefits achieved.

Table 1.2 – Energy use assessment summary					
Group member and/or business unit and/or key activity and/or site that has had an assessment by the end of this reporting period.	Assessment Status	Period over which assessment was undertaken	Energy use per annum in GJ in the current reporting year¹	% of total energy	Data accurate to ±5% Yes / No
APC (Auckland Point)	Complete	July 2007 to June 2008	3,022.8		Yes
YST1 (Yaroon St – Administration Building)	Complete	July 2007 to June 2008	1,633.8	0.2%	Yes
PRT (Property)	Complete	July 2007 to June 2008	6,282.1	0.2%	Yes
MAR (Marina)	Ongoing	July 2008 to current	3,920.8	0.4%	Yes
RGT (RG Tanna Coal Terminal)	Ongoing	July 2008 to current	647,991.1	87.0%	Yes
Others (total)	Not included this assessment cycle		101,973.3	12.2%	Yes
Total energy use of the group in the current reporting year			764,823.9		
Total energy assessed			10,938.7	1.4%	
Total energy currently under assessment			651,911.9	85.2%	

1. Includes energy usage of contractors engaged to perform services for GPC. Contractors with 'Principle Contractor Status' have been excluded.

PART 2. ENERGY EFFICIENCY OPPORTUNITIES THAT HAVE BEEN IDENTIFIED AND EVALUATED

For the purpose of participation in the Australian Government's Energy Efficiency Opportunities Program and Government and Public Reporting, GPC is one facility incorporating Port of Gladstone, Port Alma and Port of Bundaberg.

Section 2A provides a summary of opportunities that have been identified in the current reporting period and their current status.

Section 2B provides an updated summary of opportunities that have been identified in previous reporting periods and their current status.

Part 2A. New Assessments completed during the reporting period

Table 2.1 – Opportunities assessed to an accuracy of less than $\pm 30\%$						
Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	3		225	2,800	3,025
Business Response	Awaiting Investigation					
	Under Investigation					
	To be Implemented	2			2,800	2,800
	Implementation Commenced	1		225		225
	Implemented					
	Not to be Implemented					

Table 2.2 – Opportunities assessed to an accuracy of greater than $\pm 30\%$						
Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified					
Business Response	Awaiting Investigation					
	Under Investigation					

	To be Implemented					
	Implementation Commenced					
	Implemented	1 ^{1,2}				
	Not to be Implemented					

Notes:

1. Opportunities included in the table that do not yet have an estimated energy savings.
2. These projects have been implemented for operational reasons but have an impact on energy savings. Statistical analysis is required to determine the energy savings delivered by these projects.

Part 2B. Updates of assessments undertaken in previous reporting periods

In the first two public reports (2007-08, 2008-09) eighteen (18) opportunities were reported. The opportunity listed as awaiting investigation in 2007/08 under went a preliminary review in 2008/09. The outcome of this review was not to proceed because the basis of the opportunity was found to be invalid. Tables 2.3 and 2.4 summarise the progress of the remaining seventeen (17) opportunities.

Table 2.3 - Opportunities assessed to an accuracy of $\pm 30\%$ or better						
Status of opportunities identified		Number of opportunities¹	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	9	79	225	9,300	9,604
Business Response	Awaiting Investigation					
	Under Investigation					
	To be Implemented					
	Implementation Commenced					
	Implemented	9	79	225 ¹	9,300	9,604
	Not to be Implemented					

Notes:

1. The actual benefit of this opportunity was less than initially estimated and is for only one (1) conveyor tunnel lighting system and not twenty-one (21) conveyor tunnel lighting systems. Further assessment will be undertaken to determine modifying the remaining twenty.

Table 2.4 - Opportunities assessed to an accuracy of greater than $\pm 30\%$						
Status of opportunities identified		Number of opportunities	Estimated energy savings per annum by payback period (GJ)			Total estimated energy savings per annum (GJ)
			0 – < 2 years	2 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	8	2,370			2,370
Business Response	Awaiting Investigation	5	1,560			1,560
	Under Investigation	1	810			810
	To be Implemented					
	Implementation Commenced					
	Implemented	2 ^{1,2}				
	Not to be Implemented					

Notes:

1. Opportunities included in the table that do not yet have an estimated energy savings.
2. These projects have been implemented for operational reasons but have an impact on energy savings. Statistical analysis is required to determine the energy savings delivered by these projects.

SUMMARY OF SOME ENERGY EFFICIENCY OPPORTUNITIES IDENTIFIED

Opportunity 1 – Improved bulldozer fuel efficiency

GPC has energy efficiency clauses included in its tender specifications for heavy machinery and as such energy efficiency forms part of the tender evaluation process. The new D11T dozer from Caterpillar was claimed to have a 5% improvement in fuel economy compared with the previous D11R model. After taking delivery of the new D11T dozer, the fuel burn was monitored over a period of time and compared to the previous model (D11R). The analysis indicated that there was a 7.16% reduction in the fuel used by the D11T dozer to perform the equivalent amount of work.

This equates to an annual reduction in fuel usage of 35,840 litres of diesel or 1,400,000 MJ of energy. This results in a reduction of 96.7 tonnes of CO_{2-e} of gas emissions each year for every dozer that is replaced with a more efficient D11T dozer at our RG Tanna Coal Terminal.

GPC's RG Tanna Coal Terminal currently has a fleet of 23 D11 dozers. This fleet is currently under a long term replacement program which aims to replace two dozers per year with more modern fuel efficient equipment. GPC now has four (4) D11T machines in operation, the 5th is due in November 2010 and the 6th is due in March 2011.

With four D11T dozers now being utilised, GPC has reduced its dozer fleet diesel usage by approximately 50,000,000 MJ per annum plus. This equates to approximately 3,500 tonnes CO_{2-e} per annum reduction in greenhouse gas emission.

Opportunity 2 – Bulldozer reduced idle time

A research and development project is currently in progress to develop a cabin air conditioning system. The aim is to power it from an alternative energy source (batteries), rather than directly from the main engine. The target for the project is to reduce the dozer idle time from 30% to 15% of the engine run hours.

The potential benefits from this project are:

- A reduction in the fuel consumed when not performing productive work (i.e. moving coal).
- Reduced greenhouse gas emissions.
- Reduced maintenance costs due to over servicing of components not used whilst the machine is stationary and idling. The dozer maintenance schedules are based on engine run hours therefore the maintenance cost per tonne of coal handled should reduce.

Throughout the 2009/10 reporting period expressions of interest were sought to contract a supplier to develop the cabin air conditioning system. A supplier was chosen and in February 2010 the trials commenced on three dozers. The system is still in development and the focus is on achieving reliability with the air conditioning units. Over the next reporting period GPC will continue to work with the supplier to achieve the desired reliability levels before assessing the benefits of the air conditioning units on a larger scale.

Opportunity 3 – Reclaim tunnel lighting

Stage 1 of the 5 year Process Control System Upgrade, was completed in August 2010. In the 2009-10 reporting period lighting modifications were completed in the reclaim tunnel lighting systems in conveyor twenty (CC20). The lighting and ventilation system is now controlled at the tunnel access

point by a start/stop button and the vent fan also automatically starts and stops when the conveyor is utilised. The system is now on a four hour timer for vent fan and four and half for lighting instead of continuous illumination. Lighting modifications in conveyor ten (CC10) were also completed as part of the stage 1 upgraded.

CC20 was upgraded on the 28 March 2010, and was operational for 697 hours during the period 30 March 2010 to 30 June 2010. It was identified that in the three month period 1,535 hours of electricity was saved which is equivalent to 15,700 kWh of energy savings or 14,000 kg CO_{2-e}. The cost saving for CC20 is approximately \$2,600 pa. Further analysis on both conveyors will be conducted over the coming reporting period to improve our understanding of the potential benefits and also prepare the justification to modify the remaining 19.

Opportunity 4 – Data collection, management and reporting

At RGTCT, a large quantity of Powerlogic's ION meters (7650 and 6200 models) have been installed during various plant upgrades. The focus for this reporting period has been on ensuring all meters will communicate with the control system.

The primary objectives were:

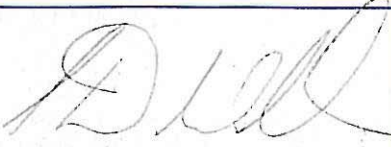
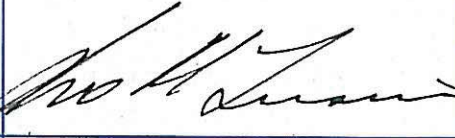
- To automatically collect all of the time-of use metering data from the existing meters installed,
- Install new meters where required, and
- Configure them to make the data available for analysis on the corporate network.

A secondary objective was to provide access to the full functionality of the ION meters from the corporate network.

All ION 7650 meters have now been upgraded and configured. Training has been conducted on the use of the ION enterprise software, specifically its' operation, functionality and how to extract and export the data. Detailed analysis can now be undertaken on the specific metering points to improve GPC understanding of energy usage at the major energy user site RGTCT.

GPC also engaged a Contractor to prepare a functional description system document that details how to manage and analyze energy data and then subsequently designed a system to implement. This work has been completed and is currently with the Energy and Climate Group for a decision on the pathway forward.

DECLARATION

<p>The information included in this report has been reviewed and noted by the Energy & Climate Steering Group and is to the best of my knowledge, correct and in accordance with the <i>Energy Efficiency Opportunities Act 2006</i> and <i>Energy Efficiency Opportunities Regulations 2006</i>.</p>	 Energy & Climate Program Lead – Port Operations General Manager
<p>The information included in this report has been reviewed and noted by the board of directors and is to the best of my knowledge, correct and in accordance with the <i>Energy Efficiency Opportunities Act 2006</i> and <i>Energy Efficiency Opportunities Regulations 2006</i>.</p>	 Chief Executive Officer