

## PUBLIC REPORT TEMPLATE

### Controlling Corporation

Orica Limited

### Period to which this report relates

Start July 1<sup>st</sup> 2009

End

June 30<sup>th</sup> 2010

### Part 1 – Information on assessments completed to date

**Table 1.1 – Description of the way in which the Corporate Group (or part of it) has carried out its assessments**

#### Leadership

Orica Limited aspires to become an organisation that does no harm to people and the environment. For Orica, this means becoming carbon and water neutral, generating zero waste and having environmentally friendly operations, products and services, all in a commercially responsible way. Progress towards this vision is currently driven through an internal programme called "Challenge 2010". Challenge 2010 is a series of internal efficiency targets aimed at improving the Company's safety, health and environmental performance. The baseline year is 2004/5 and all improvements are measured against this. The Challenge 2010 energy and greenhouse gas targets are:

- A reduction in energy consumption per tonne of production of >15%
- A reduction in emissions of total carbon dioxide equivalent gases per tonne of production of >35% comprising
  - A reduction in emissions of carbon dioxide only per tonne of production of >15%
  - A reduction in emissions of nitrous oxide per tonne of production of >50%

Orica has achieved these targets. In FY10 the Company's energy use per tonne was 17.3% below the 2004 baseline, with total greenhouse gas emissions 51.42% below the 2004 baseline.

Post 2010 targets are currently being developed in line with the 'no harm' aspiration.

Orica was one of the initial six signatories to the Federal Government's Greenhouse Challenge Programme in 1996 and can demonstrate a history of improving the efficiency of energy and water consumption and reducing its greenhouse gas emission intensity. Orica generated its final Greenhouse Challenge Plus report in March 2009, as the programme came to a close.

Orica was required to register to report energy consumption, energy production and greenhouse gas emissions in accordance with the National Greenhouse and Energy Reporting Act (2007), known as NGERs. Orica submitted its first NGERs report to the Department of Climate Change before the 31 October 2009 deadline.

The Energy Efficiency Opportunities Assessment (EEOA) programme has been completed at Orica's Kooragang Island (NSW) and Yarwun (Qld) sites and is approximately 95% complete at Botany (NSW). The assessment process undertaken at each of the sites involved Orica's corporate Sustainability Team advising the site management team of the programme framework and expectations. The site teams then allocated resources, both financial and personnel, to carry out the assessment using a method approved by the Sustainability Team. Kooragang Island was part of an EEOA trial assessment programme in 2006.

All sites had a Sustainability Champion in place to lead the teams through the EEOA process.

## **People**

Orica facilities covered by EEOA have complex chemical manufacturing processes. At all plants, process experts formed part of the assessment team. In addition, teams included reliability and plant engineers, sustainability specialists, site managers, representatives from manufacturing teams and an external Energy Management Consultant, who worked with the Federal Government's EEOA team in developing the guidelines for the programme.

The purpose of these teams is to collaborate and demonstrate alternative perspectives and practices with a view to further innovation at each plant, through conscious business case analysis to capture and enhance energy efficient opportunities

## **Information and Data Analysis**

Orica requires all large and medium sites to report energy consumption, greenhouse gas emissions, water consumption, waste generation and production into an internal database on a monthly basis. All small sites must report quarterly. The Company reports both gross and intensity (i.e. per tonne of production) figures to the Board on a monthly basis and to the community and stakeholders through the annual Orica Sustainability Report which is available on-line at [www.orica.com/sustainability](http://www.orica.com/sustainability).

At Yarwun individual plants are sub-metered for natural gas and steam use, Kooragang Island has extensive natural gas and electricity sub-metering and the larger energy users at Botany have sub-metering for steam, natural gas and electricity.

For the EEOA, the Energy Management Consultant analysed this data using various techniques including regression analysis and rolling 12 month plots to develop relationships between energy use and production, and generate internal benchmarks prior to the workshops. These were discussed in detail with relevant plant experts prior to workshops and at the workshops.

Plant experts have developed energy and mass balances with support from the Energy Management Consultant where required.

Orica participates in a global ammonia manufacturing benchmarking study which identified the Kooragang Island Ammonia Plant as one of the most efficient plants of its size and technology in the world.

## Opportunity Identification and Evaluation

### **Kooragang Island**

The assessment of opportunities was undertaken using a workshop approach, with representatives from technical, operations, reliability, sustainability and external experts to initially identify 71 potential opportunities in 2006. Evaluation by the site team and external consultant initially found that 14 of the 71 opportunities identified were both technically feasible and have a payback of less than four years. Since then changes in plant operations, energy price increases and regular review of energy opportunities has identified a further 7 opportunities.

In 2009 approval was granted for a major expansion of the site, with increases in ammonia, nitric acid and ammonium nitrate production. This will impact on the return of many of the opportunities and introduces other opportunities. Improved energy efficiency is a critical success factor in the expansion project.

The Ammonia Plant phase of the expansion project, which will be completed in July 2011, is expected to result in a 4% improvement in gas efficiency (GJ/t). This corresponds to a reduction in natural gas consumption, compared to the current gas efficiency rate, of approximately 400,000GJ/yr of natural gas and 20,000t/yr of CO<sub>2</sub>.

Electricity consumption is expected to decrease by approximately 8% following completion of the Ammonia Plant and Nitrates Plant expansion, with the decommissioning of an electrically powered plant air compressor and inclusion of a motor generator in the new acid plant.

### **Yarwun**

The assessment undertaken at Yarwun used a similar workshop approach to the one used at Kooragang Island, and was completed in 2009. A more detailed process based on Orica's Hazard Study process was used at Yarwun, which built on a review of the effectiveness of the methodology used previously at Kooragang Island. This expanded approach was used as the site has doubled in size in the last three years and the team wanted to ensure that all sustainability-related opportunities were identified (which included water and waste minimisation). Orica found the EEOA methodology to be both effective and transferable to water and waste minimisation.

The initial workshop identified 147 energy-related opportunities. Rationalising several related opportunities into a single opportunity and carrying out initial feasibility studies has identified that some 40 opportunities are both technically feasible and potentially have a payback of less than four years.

### **Botany**

The assessment at Botany followed similar processes to Kooragang Island and Yarwun. The facilities at Botany (including Orica's Chloralkali manufacturing facility and Groundwater Treatment Plant) are for the most part under six years old and incorporate modern, energy efficient equipment. A total of 21 opportunities were identified as practicable for investigation. With current energy costs, 15 have paybacks less than four years. There are some additional innovative opportunities that require significant investigation into new technology to confirm viability.

## **Decision Making**

### ***Kooragang Island***

Opportunities that were technically feasible and that meet the Orica investment criteria have been incorporated into existing systems onsite to manage implementation, with projects incorporated into the capital or operational plans. A Sustainability Steering Committee, which includes the Site Manager, Ammonia Plant Manager, Nitrates Plant Manager and Environmental Manager, was established to oversee the implementation of these projects and also to review energy use and costs. As Orica's most energy intensive site, the impact of energy use and cost on operating cost and profit is regularly reviewed by this Team. In addition, these matters are discussed with the broader Site Management Team on a regular basis.

### **Yarwun**

Opportunities were assessed to determine technical feasibility and whether the payback criteria could be met. The group assessing the projects prioritised the list based on potential savings, initial capital outlay, timeframe for payback and ease of implementation. A number of projects were completed within the period of identification and decision making. Other viable projects within the EEOA guidelines will be incorporated into the existing project management systems onsite to co-ordinate the implementation in a timeframe appropriate to each individual project. This process will allow future reviews of those projects currently deemed to meet the requirements, whilst allowing a review of those which do not presently meet these requirements.

### **Botany**

Orica's Botany site is split into two very distinct operations, but for the assessment the operation teams from the two plants came together for a workshop run by Orica's Sustainability Team. This workshop identified potential opportunities in both plants as well as where synergies between the plants existed. These opportunities were then further evaluated by the separate operations teams for practicality and likely payback periods. For the Chloralkali Plant, the decision making process has been completed. Opportunities under a four year payback period have been reviewed by management responsible for decision making and decisions have been made. There are some potential opportunities at the Groundwater Treatment Plant (GTP) which require extensive investigation, including discussions with statutory authorities, to identify their viability.

## **Communication**

Orica communicates sustainability information to employees in a variety of manners including online newsletters, email notifications, presentations and printed materials.

The Orica Update is a newsletter produced by the Company on a monthly basis which details many forms of Company news, including sustainability-related projects and updates. The Orica Update is translated into 12 languages besides English.

Orica has a sustainability website accessible through the Company's intranet. This website details the no harm strategy, has many case studies,

updates on events and relevant information.

The Sustainability Team publishes a quarterly newsletter "Towards No Harm" that details activities underway within Orica that are progressing the organisation towards its sustainability vision. This newsletter is sent directly to a group of Sustainability Champions and is made available through the Company intranet.

Orica established a Sustainability Council in July 2009. The Council comprises Group, area and major site Sustainability and SH&E Managers and is managed by the Sustainability Team. The Council was created to enhance cross-business collaboration, build internal capacity and expand the network of sustainability experts. The Council meets quarterly via teleconference and currently has 26 members from Australia, North America, Latin America, Germany, Singapore, the Philippines, Papua New Guinea, India, China and Indonesia.

The CEO and Board Safety, Health and Environment (SH&E) Committee were presented with Orica's Australian energy use and cost relative to operating cost and profit. They will communicate the outcomes of the EEOA assessments to site personnel involved in the assessments in the first quarter of 2011.

**Table 1.2 – Energy use assessed**

Group member and/or business unit and/or key activity and/or site that has had an assessment completed by the end of this reporting period.	Period over which assessment was undertaken <sup>1</sup>	Energy use per annum in GJ <sup>2</sup> in the current reporting year
Kooragang Island	April 2006 to December 2006	11,239,052
Yarwun	August 2007 to December 2008	3,100,513
Botany	January 2009 -June 2010	718,420
<b>Total energy assessed</b>		<b>15,057,985</b>
<b>Total energy use of the group in the current reporting year</b>		<b>18,413,538</b>
<b>Total energy assessed expressed as a percentage of total current energy use</b>		<b>81.8%</b>

1. This should be the start and finish date (month and year) for the assessment (planned assessment dates were nominated in Table 3.1 of the approved ARS).

2. Energy Bandwidth may only be used if approved in the Assessment and Reporting Schedule.

**Part 1 – Information on assessments completed to date (continued)**

**Table 1.3 – Accuracy of energy use data**

Entity	% achieved	Reasons for not achieving data accuracy to within ±5%

All Orica energy use data is accurate to better than +/- 5% therefore this table does not require completion.

## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2A - New Assessments completed during the reporting period

Name of Group member or business unit or key activity or site: **Botany (Chemical Services & Corporate (Groundwater Treatment Plant))**

Energy use of the entity during the current reporting period 

718,420	GJ
---------	----

**Table 2.1 – Opportunities assessed to an accuracy of ±30% or better**

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 – ≤ 4 years	> 4 years	
Outcomes of assessment*	16	27,801	2,208	6,322	36,346
Business Response*	Total Identified	27,801	2,208	6,322	36,346
	Under Investigation	3	2,208		7,861
	To be Implemented	3			3,662
	Implementation Commenced	1			10,291
	Implemented	3	8,202		8,205
Not to be Implemented	6			6,322	6,328

Name of Group member or business unit or key activity or site: **Botany (Chemical Services & Corporate (Groundwater Treatment Plant))**

Energy use of the entity during the current reporting period 

718,420	GJ
---------	----

**Table 2.2 - Opportunities assessed to an accuracy of worse than ±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 – ≤ 4 years	> 4 years	
Outcomes of assessment					
Business Response					
Total Identified	5	100		28,382	28,482
Under Investigation	4			28,382	
To be Implemented	1	100			100
Implementation Commenced					
Implemented					
Not to be Implemented					



## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2B - Update of assessments originally reported in previous reporting periods

Name of Group member or business unit or key activity or site: Kooragang Island

Energy use of the entity during the current reporting period

11,239,052	GJ
------------	----

**Table 2.3 - Opportunities assessed to an accuracy of ±30% or better**

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 – ≤ 4 years	> 4 years	
Outcomes of assessment*	21	118,195	43,341	299,755	461,291
Business Response*	Under Investigation	-		113,641	113,641
	To be Implemented			45,015	45,015
	Implementation Commenced			141,099	141,099
	Implemented	9	118,195	42,361	160,556
	Not to be implemented	1	-	980	980

## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2B - Update of assessments originally reported in previous reporting periods

Name of Group member or business unit or key activity or site: Yarwun

Energy use of the entity during the current reporting period

3,100,513	GJ
-----------	----

**Table 2.3 - Opportunities assessed to an accuracy of ±30% or better**

Outcomes of assessment*	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 – ≤ 4 years	> 4 years	
Business Response*	Total Identified	33	72,154	10,506	326,891	409,584
	Under Investigation	4	14	2,700	280,000	282,718
	To be Implemented	4	7,000	5,795	0	12,799
	Implementation Commenced	1		2,011		2,012
	Implemented	20	64,720	0	735	65,475
	Not to be Implemented	4	420		46,156	46,580

Name of Group member or business unit or key activity or site: Yarwun

Energy use of the entity during the current reporting period 

3,100,513	GJ
-----------	----

**Table 2.4 - Opportunities assessed to an accuracy of worse than ±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 - ≤ 4 years	> 4 years	
Outcomes of assessment*	7	5,470	0	168	5,638
Business Response*	1	1,500			1,500
Total Identified					
Under Investigation					
To be Implemented					
Implementation Commenced					
Implemented	5	3,970		28	
Not to be Implemented	1			140	

## Part 2 - Energy Efficiency Opportunities that have been identified and evaluated

### Part 2C - Details of at least three significant opportunities found through EEO assessments

**Table 2.5 – Description of 3 significant opportunities**

#### Opportunity 1

##### **Botany GTP/Chloralkali Steam Sharing Project**

As part of the Groundwater Treatment Plant steam is generated from process waste heat. Initially 60% of this steam was used in the process and 20% vented.

Prior to the EEO Assessment two major energy reduction projects took place. The amount of waste heat generated was reduced by 15% through process optimization and a steam main was run to the Site Utility system. This allowed the GTP Plant to supply steam to the Orica Chloralkali Plant.

At part of the EEO process the potential to reduce internal GTP steam usage was identified. This has allowed an additional 4,500t/yr of steam to be supplied to Chloralkali with a return of less than one month.

#### Opportunity 2 \*

##### **Botany Chloralkali Plate Heat Exchanger Insulation**

There are two 2.5m x 1.5m Plate Heat Exchangers used in the Caustic Soda manufacturing process. With surface temperatures of well over 100°C located in an exposed wind location heat loss was significant. They had not been insulated when installed as the insulation had to be removed at regular periods for maintenance

The assessment process identified that fitting easily removed insulation would result in significant savings. A specialist insulation company designed an insulation jacket held on with Velcro fasteners. Installing these has reduced steam use by 1,800 tonne per year with a payback less than 1 year.

#### Opportunity 3 \*\*

##### **Yarwun Nitrates Compressed Air System**

The original air compressors were old, inefficient and in need of major overhaul. Instead of spending significant sums of money on maintenance the EEO assessment identified that modern efficient compressor with a Variable Speed Drive compressor used to meet fluctuating demands would reduce energy use and maintenance costs.

When the costs of not overhauling the compressors were factored into the capital cost the project met Orica hurdle rates. This will save over 550,000kWh/yr with a return of under 3 years.

## Part 3 - Voluntary Contextual Information

### Table 3.1 – Contextual Information

Orica Limited is continuing to work towards its sustainability vision of becoming carbon and water neutral, generating zero waste and having environmentally friendly operations, products and services, all in a commercially responsible way. Progress towards this vision is detailed extensively in Orica's web-based 2010 Sustainability Report which can be accessed through [www.orica.com/sustainability](http://www.orica.com/sustainability).

Between 2000 and 2005 as part of its internal Challenge 2005 targets, Orica reduced its total energy intensity by 21%. In addition, greenhouse gas intensity fell by 28% and water intensity by 21%. The Company's Challenge 2010 targets were for a further 15% reduction in energy and water intensity across the whole company.

Our FY10 performance was a 17.4% reduction in energy intensity and a 17.9% reduction in water intensity. More detail on Orica's energy, greenhouse and water impacts can be found at <http://www.orica.com/sustainability/?page=57> and <http://www.orica.com/sustainability/?page=59>.

Orica is continuing to incorporate sustainability objectives in new and existing investments both in Australia and overseas. Examples include the use of renewable energy and natural cooling at a new facility in China

## Part 4 - Declaration

### Table 4.1 - Declaration of accuracy and compliance (mandatory information)

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 *Energy Efficiency Opportunities Act 2006* and *Energy Efficiency Opportunities Regulations 2006*.



Insert Title of Signatory here C.E.O.