

# MINARA RESOURCES LIMITED

## Energy Efficiency Opportunities Public Report (2009 - 2010)



### Controlling Corporation

Minara Resources

### Period to which this report relates

Start 1 July 2006

End 30 June 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**

Minara Resources conducted Energy Efficiency Opportunities (EEO) assessments from December 2007 to June 2008. During this time, approximately 90% of the corporation's energy use was assessed.

During the assessment process, workshops were conducted in all departments across the organisation. Personnel that had the ability to influence energy usage attended these. The workshops resulted in a number of energy efficiency opportunities being identified within each area. Opportunities were then recorded and prioritised, taking into account factors such as payback period, energy savings and implementation costs. Once this process was completed the appropriate business response could be enacted.

Progress on the opportunities identified during this assessment period is shown in Table 2.3.

Minara Resources has continued to identify and implement new energy efficiency opportunities during the 2009-2010 reporting period. A summary of these is shown in Table 2.1. Many of the projects are directed at higher throughput which results in improved energy efficiency rather than reduced energy consumption. Generally, any increases in production throughput result in a sizable reduction in the energy consumption per unit of metal produced.

Outcomes of the assessments are communicated to employees and progress of the EEO program is presented at management meetings. A summary of the information is also presented to the Board during board meetings and is included in the Minara Resources Limited Annual Report.

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

<b>Table 1.2 – Energy use assessed</b>		
<b>Group member and/or business unit and/or key activity and/or site (or part thereof) that has had an assessment completed by 30 June 2010 (Include all assessments completed to date for the current 5 year cycle).</b>	<b>Period over which assessment was undertaken</b>	<b>Energy use per annum in GJ for the current reporting year.</b>
Murrin Murrin Joint Venture	01.07.06-30.06.08 01.07.08-30.06.09 01.07.09-30.06.10	11,658,728 GJ
<b>Total energy use of assessed entities (or part thereof)</b>		<b>10,492,855 GJ</b>
<b>Total energy use of the whole corporate group in the current reporting year (01.07.09-30.06.10).</b>		<b>11,658,728 GJ</b>
<b>Total energy use of assessed entities (or part thereof) for the period 01.07.09 to 30.06.10 expressed as a percentage of total energy use for the period 01.07.09 to 30.06.10.</b>		90%

<b>Table 1.3 – Accuracy of energy use assessed data</b>		
<b>Entity</b>	<b>% achieved</b>	<b>Reasons for not achieving data accuracy to within ±5%</b>
Murrin Murrin Joint Venture	±5%	Not applicable

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

### Part 2A - New assessments completed or not reported since your last Public Report

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Total energy use for the period 01.07.09 to 30.06.10 of the assessed entity (or part thereof) from which the opportunities identified below were generated (and is reported in Table 1.2).

11,658,728	GJ
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<b>Table 2.1 – Opportunities assessed to an accuracy of better than or equal to (&lt;=) ±30%</b>									
Status of opportunities identified		Total 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		
			No of Opps.	GJ	No of Opps.	GJ	No of Opps.	GJ	
Business Response	Under Investigation	2	2	2,165,000	nil	nil	nil	nil	2,165,000
	To be Implemented	nil	nil	nil	nil	nil	nil	nil	nil
	Implementation Commenced	2	2	330,000	nil	nil	nil	nil	330,000
	Implemented	1	1	285,000	nil	nil	nil	nil	285,000
	Not to be Implemented	nil	nil	nil	nil	nil	nil	nil	nil
Outcomes of assessment	Total Identified	5	5	2,780,000	nil	nil	nil	nil	2,780,000

**Part 2A - New assessments completed during the reporting period** (continued)

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Total energy use for the period 01.07.09 to 30.06.10 of the assessed entity (or part thereof) from which the opportunities identified below were generated (and is reported in Table 1.2).

11,658,728	GJ
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<b>Table 2.2 – Opportunities assessed to an accuracy of worse than (&gt;) ±30%</b>									
<b>Status of opportunities identified</b>		<b>Total Number of opportunities</b>	<b>Estimated energy savings per annum by payback period (GJ)</b>						<b>Total estimated energy savings per annum (GJ)</b>
			<b>0 – &lt; 2 years</b>		<b>2 – ≤ 4 years</b>		<b>&gt; 4 years</b>		
			<b>No of Opps.</b>	<b>GJ</b>	<b>No of Opps.</b>	<b>GJ</b>	<b>No of Opps.</b>	<b>GJ</b>	
Business Response	Under Investigation								
	To be Implemented								
	Implementation Commenced								
	Implemented								
	Not to be Implemented								
Outcomes of assessment	Total Identified								

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

### Part 2B - Update of assessments reported in previous Public Reports

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Total energy use for the period 01.07.09 to 30.06.10 of the assessed entity (or part thereof) from which the opportunities identified below were generated (and is reported in Table 1.2).

11,658,728	GJ
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<b>Table 2.3 – Opportunities assessed to an accuracy of better than or equal to (&lt;=) ±30%</b>									
Status of opportunities identified		Total 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		
			No of Opps.	GJ	No of Opps.	GJ	No of Opps.	GJ	
Business Response	Under Investigation	6	5	45,509	1	6334	nil	nil	51,843
	To be Implemented	nil	nil	nil	nil	nil	nil	nil	nil
	Implementation Commenced	8	7	658,792	1	310,927	nil	nil	969,719
	Implemented	8	7	635,587	1	2818	nil	nil	638,405
	Not to be Implemented	1	1	3504	nil	nil	nil	nil	3504
Outcomes of assessment	Total Identified	23	20	1,343,392	3	320,079	nil	nil	1,663,471

**Part 2B - Update of assessments originally reported in previous Public Reports (continued)**

Name of Group member or business unit or key activity or site: **Murrin Murrin Joint Venture**

Total energy use for the period 01.07.09 to 30.06.10 of the assessed entity (or part thereof) from which the opportunities identified below were generated (and is reported in Table 1.2).

11,658,728	GJ
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**Table 2.4 – Opportunities assessed to an accuracy of worse than (>) ±30%**

Status of opportunities identified		Total 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		
			No of Opps.	GJ	No of Opps.	GJ	No of Opps.	GJ	
Business Response	Under Investigation								
	To be Implemented								
	Implementation Commenced								
	Implemented								
	Not to be Implemented								
Outcomes of assessment	Total Identified								

## 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

##### **Nickel Hydroxide – Supplementary Feed**

This project involves the treatment of nickel hydroxides within the Murrin Murrin processing facility. The feasibility of economically treating this product is under investigation.

Treatment of hydroxides would provide increased nickel and cobalt production at almost the same base energy consumption, resulting in a significant reduction in the energy required per tonne of metal produced. The material would be introduced into the existing process, downstream of the nickel and cobalt sulfide precipitation circuit and hence avoid treatment in the higher energy consuming 'front-end' of the circuit.

It has been estimated on a preliminary basis that up to 5000 tonnes of metal per year may be able to be processed through the Refinery without impacting on supply limits of the Utilities area, including water, steam, hydrogen sulfide gas, oxygen etc.

It is estimated on a preliminary basis, that gas savings of up to 1,415,000 GJ per annum may be able to be achieved as a result of improved efficiency.

Project Status: *Under Investigation.*

#### Opportunity 2

##### **Concentrate Leaching and Mt Lucky Dual Streaming**

The viability of treating sulfide concentrates via High Pressure Acid Leach (HPAL) has been further studied and discussions are ongoing regarding sourcing sulfide concentrate as a feedstock. This provides the ability to increase nickel and cobalt production at reduced energy consumption per tonne of metal produced.

The HPAL autoclaves have been constructed of materials that will withstand the conditions resulting from the treatment of lateritic ores. The treatment of sulfidic ores however, can result in conditions that are detrimental to these materials of construction. With the introduction of selected additives, the autoclave conditions can be manipulated such that they are capable of treating these sulfide rich ores without detrimental impact on these materials of construction.

The Mt Lucky deposit has been purchased by Minara Resources. This deposit contains minerals that can be used for the purpose described above, resulting in both higher throughputs and less energy (per tonne of ore treated) being required.

This project will incur approximately \$10.5M in capital expenditure and it is calculated that gas savings will exceed 750,000 GJ per annum as a result of improved efficiency.

Project Status: *Under Investigation.*

### Opportunity 3

#### **Western Areas Oxide – Supplementary Feed**


Terms were reached during the reporting period regarding sourcing Western Areas Oxide material as a High Pressure Acid Leach (HPAL) feed stock. Treatment commenced in June 2010 with an additional 456 tonnes of metal processed to date and no increase in energy inputs required. This equates to approximately 900 tonnes of metal per year.

There is no significant capital cost incurred and an estimated energy savings of 285,000 GJ per year can be realised.

Project Status: *Implemented.*

## 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 <i>Energy Efficiency Opportunities Act 2006</i> and <i>Energy Efficiency Opportunities Regulations 2006</i> .	
	Peter Johnston – Managing Director & CEO
	29.12.10