Australian Government
Department of Resources, Energy and Tourism

Energy Efficiency Opportunities

Queensland Nickel Pty Ltd

Energy Efficiency Opportunities

Public Report 2012

PUBLIC REPORT 2012

Part 1 - Corporation Details

Controlling Corporation

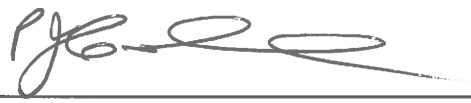
Insert the name of the Controlling Corporation exactly as it is registered with the EEO Program.

Queensland Nickel Pty Ltd

Table 1.1 - Major Changes to Corporate Group Structure or Operations

Table 1.1 – Major Changes to Corporate Group Structure or Operations in the last 12 months
No major changes for FY2012

Declaration

Declaration of accuracy and compliance	
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*.	 Phil Collins Managing Director **Date** 28.12.12

Part 2 - Assessment Outcomes

Table 2.1 – Assessment Details

It is compulsory to complete a separate table for each entity* that has been assessed

Name of entity	Palmer Nickel and Cobalt Refinery

Total energy use in the last financial year	19,978,808	GJ
Total percentage of energy use assessed when assessments were undertaken	57	%

Description of the way in which the entity carried out its assessment

An energy mass balance was produced for the raw materials and refinery areas of the plant. This mass balance was used to map waste heat streams that could be used for beneficial use. A number of streams were identified for the potential opportunistic harvesting of waste heat. This process also identified that the METSIM model for the refinery processes needed to be updated with an energy balance added to it. This energy balance will be the basis of targeted ideas generation sessions going forward. A number of projects with potential energy efficiency aspects were also identified as part of ongoing business improvement processes. All projects are recorded in individual files and assessed by process engineers.

* Entity is group member, business unit, or key activity. Please note that, for individual sites that use more that 0.5PJ of energy, all energy use must be assessed (less a small proportion for non integral energy use).

Table 2.2 - Energy efficiency opportunities identified in the assessment

It is compulsory to complete a separate table for each entity that has been assessed

Status of opportunities identified to an accuracy of better than or equal to ±30%		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	Implemented	4	4	85251					85251
	Implementation Commenced	1			1	159000			159000
	To be Implemented	0							0
	Under Investigation	1			1	226800			226800
	Not to be Implemented	0							0
Outcomes of assessment	Total Identified	6	4	85251	2	385800			471051

Please note that Corporate Groups **are not required** to report opportunities with a payback greater than 4 years. Reporting this data is voluntary.

Table 2.3 - Details of significant opportunities identified in the assessment

Corporate Groups are required to provide at least 3 examples of significant opportunities for improving the energy efficiency of the group that have been identified in assessments.

Description of Opportunity No 1	Voluntary Information	
Conversion of the Roasting area from HFO to CSM It is proposed that the ore roasting and reduction process can be converted from the use of heavy fuel oil to coal seam methane as the fuel in the burners in the first instance. The trial will also encompass the feasibility of using CSM as a Reductant as a replacement to HFO. It is envisaged that the initial burner conversion will save energy through efficiencies gained in stability but these won't be very high. The larger energy efficiency will occur if CSM can be used as a Reductant. Overall, the following efficiencies are expected to be achieved: 1. Elimination of HFO reductant addition to roaster feed ore through CSG addition to the lower hearths of the roasters. 2. Increased nickel and cobalt reduction efficiency through improved roaster operational stability. 3. Decreased aerator oxygen transfer requirement, decreased leach liquor cooling requirement and increased cobalt leach extraction efficiency through improved control of extractable Fe content of roasted ore. 4. Decreased aerator oxygen transfer requirement, decreased leach liquor cooling requirement and increased cobalt leach extraction efficiency through decreased extractable S content of roasted ore. 5. Increased nickel and cobalt leach extraction efficiency through decreased metal sulphide loss in ore tailings.	Equipment Type	8 m diameter by 23 m high Nichols Herreshoff multiple hearth reduction furnaces, each containing 17 bricked hearths
	Business Response	Trial conversion on one of the 12 roasters
	Energy saved (GJ)	159,000 pa in fuel plus and estimated 5% increase in recovery
	Greenhouse gas abated (CO2-e)	96000 t
	$s saved	35.8M
	Payback period	<2 years

Description of Opportunity No 2	Voluntary Information	
Ore drying and grinding through use of alternate technologies. Currently, ore reclaimed from the solar drying area is further dried in 3 34m long rotary kilns to a nominal moisture content of 6% before the grinding process can begin. Two of the dryers are fuelled by coal and the other is fuelled by coal seam methane. Dried ore is then fed through two electrically driven ball mills. It is proposed that other technologies could replicate ore grinding and/or drying at a lower fuel cost.	Equipment Type	Vortex technology
	Business Response	Investigate pilot options
	Energy saved (GJ)	226800 pa
	Greenhouse gas abated (CO2-e)	19500
	$s saved	6.9M
	Payback period	<4 years

Description of Opportunity No 3	Voluntary Information	
Change cleaning process for the two magma stills connected to preheating the boiler feed water to reduce downtime. Currently there are three stills, two of which have the capacity to pre-heat boiler feed water. This opportunity will reduce the downtime on these two stills and effectively reduce the amount of energy needed to produce steam in the boilers..	Equipment Type	Pipework
	Business Response	Implemented
	Energy saved (GJ)	9753
	Greenhouse gas abated (CO2-e)	862 (t)
	$s saved	31000pa
	Payback period	1.1 years

Please note that the “Description of the Opportunity” above should include information on the specific nature and type of opportunity as well as information on the type of equipment and/or process involved.