GOLD FIELDS

Energy Efficiency Opportunities

ENERGY EFFICIENCY OPPORTUNITIES PUBLIC REPORT F2009

Controlling Corporation

Gold Fields Australia Pty Ltd

Period to which this report relates

Start 1st July 2008 **End** 30 June 2009

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

Gold Fields Australia has continued to undertake assessments over the reporting period. Assessments at both the St Ives and Agnew Gold mines were completed and results are reported in Part 2 of this report. The assessment processes established and tested in the previous reporting period were once again used although standardisation of the assessment tool was achieved across the two assessed sites. The result was an improvement in the speed and accuracy of both the assessment and reporting processes. External consultants have essentially been replaced by Gold Fields staff, with a resource located in the Perth office as well as on both mine sites.

Key projects that have been progressed include an airstrip upgrade, fuel management system installation, ore haulage optimisation and secondary fan rationalisation. Progress on the implementation is published on the company website and is now also reported to the Safety, Health & Sustainable Development Committee.

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[1]	Energy use per annum in GJ[2] in the current reporting year
Agnew Gold Mine	July 2008 to June 2009	380,288
St Ives Gold Mine	July 2008 to June 2009	1,933,775
Total energy assessed		**2,314,063**
Total energy use of the group in the current reporting year		**2,320,942**
Total energy assessed expressed as a percentage of total current energy use		99.7%

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.

Table 1.3 – Accuracy of energy use data

Entity	% achieved	Reasons for not achieving data accuracy to within ±5%
Agnew Gold Mine	±5%	n/a
St Ives Gold Mine	±5%	n/a

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: Agnew Gold Mine

Energy use of the entity during the current reporting period	380,288	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*	Total Identified	4	347	3,217	1,352	4,916
Business Response*	Under Investigation	0	0	0	0	0
	To be Implemented	1	0	3,217	0	3,217
	Implementation Commenced	2	0	0	1,352	1,352
	Implemented	1	347	0	0	347
	Not to be Implemented	0	0	0	0	0

Name of Group member or business unit or key activity or site: Agnew Gold Mine

Energy use of the entity during the current reporting period	380,288	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	Total Identified	3	3,473	16,339	0	19,812
Business Response	Under Investigation	2	0	16,339	0	16,339
	To be Implemented	0	0	0	0	0
	Implementation Commenced	1	3,473	0	0	3,473
	Implemented	0	0	0	0	0
	Not to be Implemented	0	0	0	0	0

Part 2A - New Assessments completed during the reporting period

Name of Group member or business unit or key activity or site: St Ives Gold Mine

Energy use of the entity during the current reporting period	1,933,775	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*	Total Identified	5	62,116	0	11,515	73,631
Business Response*	Under Investigation	0	0	0	0	0
	To be Implemented	1	56,356	0	0	56,356
	Implementation Commenced	0	0	0	0	0
	Implemented	3	5,716	0	11,515	17,231
	Not to be Implemented	1	44	0	0	44

Name of Group member or business unit or key activity or site: St Ives Gold Mine

Energy use of the entity during the current reporting period	1,933,775	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	Total Identified	3	19,641	0	14,741	34,382
Business Response	Under Investigation	1	17,048	0	0	17,048
	To be Implemented	0	0	0	0	0
	Implementation Commenced	0	0	0	0	0
	Implemented	1	0	0	14,741	14,741
	Not to be Implemented	1	2,593	0	0	2,593

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: Agnew Gold Mine

Energy use of the entity during the current reporting period	380,288	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*	Total Identified	**35** (34)	**27,825** (25,603)	**14,943** (13,220)	**14,364** (nil)	**57,132** (38,823)
Business Response*	Under Investigation	**1** (0)	**505** (nil)	**nil** (nil)	**nil** (nil)	**505** (nil)
	To be Implemented	**4** (9)	**nil** (16,260)	**1,557** (1,198)	**3,717** (nil)	**5,274** (17,458)
	Implementation Commenced	**0** (2)	**nil** (277)	**nil** (733)	**nil** (nil)	**nil** (1,010)
	Implemented	**16** (9)	**14,706** (9,066)	**13,386** (11,298)	**9,449** (nil)	**37,541** (20,355)
	Not to be Implemented	**14** (14)	**12,614** (nil)	**nil** (nil)	**1,198** (nil)	**13,812** (nil)

1. ( ) denotes figures from F2008 period.

Name of Group member or business unit or key activity or site: Agnew Gold Mine

Energy use of the entity during the current reporting period	380,288	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*	Total Identified	**21** (22)	**9,974** (19,060)	**13,531** (8,678)	**19,793** (nil)	**43,298** (27,738)
Business Response*	Under Investigation	**10** (22)	**3,667** (19,060)	**4,633** (8,678)	**1,029** (nil)	**9,329** (27,738)
	To be Implemented	**1** (0)	**0** (nil)	**315** (nil)	**0** (nil)	**315** (nil)
	Implementation Commenced	**3** (0)	**6,307** (nil)	**0** (nil)	**16,592** (nil)	**22,899** (nil)
	Implemented	**2** (0)	**0** (nil)	**6,485** (nil)	**0** (nil)	**6,485** (nil)
	Not to be Implemented	**5** (0)	**0** (nil)	**2,098** (nil)	**2,172** (nil)	**4,270** (nil)

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

Name of Group member or business unit or key activity or site: St Ives Gold Mine

Energy use of the entity during the current reporting period	1,933,775	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*	Total Identified	**13** (13)	**77,118** (70,623)	**1,499** (28,436)	**233** (nil)	**78,850** (99,059)
Business Response*	Under Investigation	**(0)** (0)	**(nil)** (nil)	**(nil)** (nil)	**nil** (nil)	**(nil)** (nil)
	To be Implemented	**0** (10)	**nil** (1,128)	**nil** (20,967)	**nil** (nil)	**nil** (22,095)
	Implementation Commenced	**2** (0)	**nil** (nil)	**270** (nil)	**233** (nil)	**503** (nil)
	Implemented	**4** (3)	**76,996** (69,495)	**nil** (7,469)	**nil** (nil)	**76,996** (76,964)
	Not to be Implemented	**7** (0)	**122** (nil)	**1,229** (nil)	**nil** (nil)	**1,351** (nil)

Name of Group member or business unit or key activity or site: St Ives Gold Mine

Energy use of the entity during the current reporting period	1,933,775	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*	Total Identified	**25** (25)	**10,978** (439)	**29,662** (1,694)	**16,773** (nil)	**57,413** (2,133)
Business Response*	Under Investigation	**7** (25)	**2,756** (439)	**20,012** (1,694)	**nil** (nil)	**22,768** (2,133)
	To be Implemented	**0** (0)	**nil** (nil)	**nil** (nil)	**nil** (nil)	**nil** (nil)
	Implementation Commenced	**0** 0	**nil** (nil)	**nil** (nil)	**nil** (nil)	**nil** (nil)
	Implemented	**1** 0	**nil** (nil)	**6,253** (nil)	**nil** (nil)	**6,253** (nil)
	Not to be Implemented	**17** 0	**8,222** (nil)	**3,397** (nil)	**16,773** (nil)	**28,392** (nil)

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
Opportunities 1-3: Agnew Gold Mine
Opportunity 1 - Knelson Feed Water Supply
The Knelson Concentrator in the Agnew CIL plant requires volumes of water to feed into a spinning bowl at a pressure of approximately 400kPa to separate free gold from the crushed ore. The Knelson previously sourced water from the potable water tank fed by a designated pump. Recently the process feed water system to the plant was upgraded to allow greater flow and pressure of process return water to the processing area. It was identified that improvements in this return water could then allow the Knelson to be fed from this upgraded return water line without significant changes to the existing infrastructure. The pipe work was altered to feed into the Knelson feed water line as well as installing a pressure reducer (700kPa down to 400kPa) to protect the concentrator from excessive pressure. Completing this installation allowed for the total removal of the pump (11kW) that previously fed the concentrator. **Energy Saving: 350 GJ per annum** **Emission Saving: 81 tCO2e per annum** **Cost Saving: A$11,500 per annum**
Opportunity 2 - Second Process Compressor Upgrade
The leaching process at Agnew uses compressed air to agitate both the leach and adsorption tanks. The existing compressors operate at full load continuously. A project was implemented in 2008 to replace one of the compressors with a variable speed compressor and that project has been successfully implemented. A second compressor has since been installed to replace the older, less efficient Sullair unit. The new compressor operates at an optimised volume to maintain line flow and pressure depending on the process requirements. Installing these compressors has saved approximately 60kW each. **Energy Saving: 1,894 GJ per annum** **Emission Saving: 457 tCO2e per annum** **Cost Saving: A$63,000 per annum**

Opportunity 3 - Secondary Fan Rationalisation

In the past six months, the Agnew underground team has been investigating possible efficiency improvements within the mine ventilation system. A number of issues have been highlighted through this work;

- When the secondary fans are turned off the ventilation bags sag and are ripped by the passing trucks
- Secondary ventilations fans are therefore not turned off to reduce the risk of the vents being damaged
- Due to inefficiencies within the primary ventilation system, there are additional fans in the secondary ventilation system.

The engineering department for the mine improved the efficiency of the primary vent system by repairing leaks in the return air way (RAW) and improving the pitch of the primary fan blades. Once this was completed a number of fans in the upper levels of the mine were able to be removed and some relocated to the newly developed lower levels of the mine. It is estimated that two 110kW fans were effectively removed from the mine and assuming that these fans run 50% of the time, the savings are as follows.

Energy Saving: 3,472 GJ per annum
Emission Saving: 838 tCO2e per annum
Cost Saving: A$115,500 per annum

Opportunities 4-6: St Ives Gold Mine

Opportunity 4 – Airstrip upgrade

The Gold Fields - St Ives Gold Mine ("SIGM") employs 650 staff and contractor personnel. Approximately 250 personnel are employed on a fly-in / fly out (FIFO) basis. Previously the nearest airport to facilitate the FIFO arrangement was located 70 kilometres away. An airstrip some 51 kilometres closer to the mine site was upgraded to allow 50-seater commercial aircraft to land. In doing so, considerable savings were achieved in light vehicle transport fuel use and associated emissions, as well as non-productive work time, accommodation and third party transport fares.

Energy Saving: 14,741 GJ per annum
Emission Saving: 1,030 tCO2e per annum
Cost Saving: A$446,000 per annum

Opportunity 5 – Fuel management system

Distribution of diesel fuel and reporting of diesel fuel consumption was previously managed using a manual system at SIGM. An automated, integrated fuel management system was installed to maximise efficiency, effectiveness, accuracy of reporting and reconciliation of diesel fuel consumption. By capitalising on the accuracy of diesel fuel transactions, vehicle and machine economy rates are monitored to ensure Original Equipment Manufacturer ("OEM") consumption rates are achieved. Unauthorised diesel fuel transactions have decreased dramatically in line with the introduction of this management system.

Energy Saving: 11,515 GJ per annum
Emission Saving: 800 tCO2e per annum
Cost Savings: A$348,000 per annum

Opportunity 6 – Ore haulage optimization

A haulage contractor is engaged to deliver ore to two centralized processing plants at SIGM, from a multitude of remote ore sources. An opportunity was identified to consolidate the refueling bay, office and meal break amenities closer to one of the larger ore sources. A substantial increase in haulage efficiency has been gained by using less diesel fuel as the contractor does not generally have to travel far back to the central refueling bay and office area. Productive haulage has increased, realizing a reduction in the actual haulage fleet of prime movers. Energy efficient power supplies (where practical) and energy efficient lighting has also been installed at the consolidated remote work area to maximise the benefits from this opportunity.

Energy Saving: 4,604 GJ per annum
Emission Saving: 319 tCO2e per annum
Cost Saving: A$139,000 per annum

Part 3 - Voluntary Contextual Information

Table 3.2 – Energy use expressed in Greenhouse Gas emissions and as an energy use indicator			
Period of energy use 1st July 2008 to 30th June 2009			
Name of group member/ business unit/ key activity/site	**Energy use pa (GJ)**	**Energy use pa (GGE)**	**Energy use as an indicator***
Agnew Gold Mine	380,288	58,886	1.98GJ/oz
St Ives Gold Mine	1,933,775	265,648	4.51GJ/oz
Total	**2,314,063**	**324,534**	**3.73GJ/oz**

Table 3.4 – Changes in energy use as an indicator			
Name of group member/ business unit/ key activity/site	**Current energy use as an indicator**	**Previous energy use as an indicator**	**Reasons for change**
Agnew Gold Mine	1.98GJ/oz	1.86GJ/oz	Lower grade material mined & processed
St Ives Gold Mine	4.51GJ/oz	4.30GJ/oz	Lower grade material mined & processed
Total	**3.73GJ/oz**	**3.51GJ/oz**	

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.*	**Glenn Baldwin – Executive Vice President and Director, Gold Fields Australia Pty Limited**