Australian Government
Department of Industry

Energy Efficiency Opportunities

PUBLIC REPORT

Part 1 - Corporation details

Period to which the report relates

Start Period: June 2011

End Period: June 2013

Controlling corporation

Insert the name of the controlling corporation exactly as it is registered with the EEO Program.

Electricity Generation Corporation

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
Muja AB station is being brought back into service from a preservation condition. Muja Stage B, comprising of Unit 3 and Unit 4, returned to service in the first quarter of 2013. Muja Stage A, comprising of Unit 1 & Unit 2, is planned to return to service the first quarter of the calendar year 2014. Muja AB is owned by the joint venture company Vinalco, which is 100% owned and controlled by Verve Energy. Muja AB energy usage will be assessed before end of the First Assessment Cycle in June 2016. Verve Energy has increased its renewable production portfolio in the last financial year. Through joint ventures with private sectors investors, Verve Energy completed the 10MW Greenough River Solar Farm in September 2012 and the 55MW Mumbida Wind Farm in May. The introduction of this additional renewable energy will play a role in the reduction of the CO_2 emissions.

Declaration

Declaration of accuracy and compliance	
The information included in this report will be 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. All opportunities have been assessed to a level of accuracy that is commensurate with the financial investment required for implementation.	Jason Waters CEO, Verve Energy
	Date: 24.12.13

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Part 2 - Assessment outcomes

(If you are a 2006–07 trigger corporation, you do not have to complete this section. Please move on to Part 3)

It is compulsory to complete Tables 2.1 to 2.3 for each entity (subsidiary, business unit, key activity or site) that has been assessed.

Table 2.1 – Assessment details

Name of entity	Muja Power Station Stage D

A. Total corporate energy use in the last financial year	18,829,746	GJ
B. Total energy use covered by assessments	18,793,585	GJ
C. Total percentage of energy use assessed (B ÷ A) x 100	99.81	%

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

The core of the assessment for Muja Power Station Stage D was to run the Energy Efficiency Opportunity Workshop. Before the workshop, a detailed data analysis to quantify the performance of core generating plant and major auxiliaries was conducted. Operational data from July 2010 to June 2012 has been used for this analysis. All the analysis was summarized in the workshop background paper and provided to the workshop attendees, and the attendees examined energy performance under fluctuating loads, energy and material flows for different plants and systems, and prepared some ideas before coming to the workshop.

The Muja Stage D workshop was held on Muja site on 25th and 26th March 2013. The Workshop was attended by Verve Energy representatives from technical, environment, operational, maintenance and finance sections to promote valuable discussion. Some main contractors were also involved in the assessment.

A total of 117 ideas were generated in this workshop and 22 of them were filtered by the workshop attendees as low cost, high payback benefit and lower risk to be considered for further investigations and implementation depending on the technical and economic viability.

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Name of entity	Collie Power Station

D. Total corporate energy use in the last financial year	15,388,826	GJ
E. Total energy use covered by assessments	15,310,261	GJ
F. Total percentage of energy use assessed (B ÷ A) x 100	99.49	%

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

Similar To the Muja Stage D assessment process, an Energy Efficiency Opportunity Workshop was also undertaken for Collie Power Station. Built on the experience of the Muja D EEO workshop, Verve Energy thermal performance engineers produced an even more comprehensive background paper for the Collie Workshop, and detailed analysis has covered not only the major plants, but also the individual pumps, fans and other major auxiliaries. Operational data from July 2010 to June 2012 has been used for this analysis. All this information was sent out to the workshop attendees prior to the workshop and the attendees examined energy performance under fluctuating loads, energy and material flows for different plants and systems, and prepared some energy saving ideas before coming to the workshop.

The Collie workshop was held at Collie site on 29th and 30th April 2013. The Workshop was attended by Verve Energy representatives from technical, environment, operational, maintenance and finance sections to promote valuable discussion.

A total of 92 ideas were generated in this workshop and 28 of them were filtered by the workshop attendees to be low cost, high payback benefit and lower risk that would be considered for further investigations and implementation depending on their technical and economic viability.

Table 2.2 - Energy efficiency opportunities identified in the assessment

Status of opportunities identified (Muja Stage D)		Total Number of opportunities	Total estimated energy savings per annum (GJ)
Business response	Implemented	3	16,500
	Implementation commenced	4	87,900
	To be implemented	2	150
	Under investigation	9	36,000
	Not to be implemented	4	0
Outcomes of assessment	Total identified	22	140,500

Status of opportunities identified (Collie Power Station)		Total Number of opportunities	Total estimated energy savings per annum (GJ)
Business response	Implemented	4	22,300
	Implementation commenced	1	300
	To be implemented	1	100
	Under investigation	11	129,700
	Not to be implemented	11	0
Outcomes of assessment	Total identified	28	152,400

Please note that corporate groups **are not required** to report opportunities with a payback greater than four years. Reporting this data is voluntary.

Table 2.3 - Details of significant opportunities identified in the assessment

It is compulsory to report at least 1 example of a significant opportunity for improving the energy efficiency for the controlling corporation that has been identified in assessments. If a corporation has structured assessments to relate to business units or key activities they should report one significant opportunity for each of those entities to which the assessment applies.

Description of opportunity No. 1	Type of information to be covered
Improve the Performance of High Pressure Heater 6 in Collie Power Station This opportunity was identified in Collie's EEO workshop. The Terminal Temperature Difference (TTD) of the HP heater 6 was found too high, which indicated a poor performance of the heater. The workshop attendees suggested investigating the cause of the performance change of this heater and further investigation required the heater to be cleaned during outage. The offline cleaning of this heater was conducted, and the performance of HP heater 6 shows better than design performance afterwards. The energy saved is quantified as 13,000 GJ per annum, with CO_2 abated at about 1200 tonnes. The annual net financial saving will be AU$ 40,000. The payback period of this project is within four months. The accuracy of the operating data and financial evaluation reported above is within ±10%.	Equipment type Business response Energy saved (GJ) Greenhouse gas abated (CO2-e) $ saved Payback period

Description of opportunity No. 2 – voluntary	Type of information to be covered
Main Steam and Reheat Steam Spray Valve Replacement for Muja Stage D Units. Currently, Muja Stage D units are experiencing both superheat and reheat spray valves leaking problems. The unwanted spray water depresses main steam and hot reheat steam temperature. The valve replacement will reduce the unwanted water spray into the main steam and reheat steam system, so that the final steam temperatures can be maintained close to target and the turbine heat rate is also improved. This opportunity is planned to be implemented. The potential energy saving will be 40,900 GJ with CO_2 abated at 3,800 tonnes. The annual net financial saving will be AU$ 7,400. The payback period of this project is 3.8 years. The accuracy of the operating data and financial evaluation reported above is within ±10%.	Equipment type Business response Energy saved (GJ) Greenhouse gas abated (CO2-e) $ saved Payback period

Description of opportunity No 3 – voluntary	Type of information to be covered
Condenser Offline Cleaning for Muja Stage D Units.	Equipment type
The Muja Stage D condensers often experienced high back pressure problems, which caused a significant energy loss and commercial loss. Regular offline cleaning of the condenser will improve the condenser performance.	Business response
	Energy saved (GJ)
	Greenhouse gas abated (CO2-e)
This opportunity has been implemented. The potential energy saving will be 45,000 GJ with CO_2 abated at about 4,200 tonnes. The annual net financial saving will be AU$ 103,000.	$ saved
The payback period of an offline cleaning cost is usually within two weeks after the unit return to service.	Payback period
The accuracy of the operating data and financial evaluation reported above is within ±10%.	

Please note that the *Description of 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.

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Part 3 - Transition to second cycle – Not applicable to Verve Energy

This part should only be completed by 2006–07 trigger year corporations transitioning to the second cycle.

Table 3a – Details of business response to opportunities under investigation as at 30 June 2012

In December 2012, many corporations reported energy efficiency opportunities that were still under investigation as at 30 June 2012. This report should advise what your business response to these opportunities has been—implemented or not to be implemented. If you intend to further investigate these opportunities, they should be reported in the future public reports as opportunities identified in the second cycle.

For each entity that had energy efficiency opportunities that were still under investigation as at 30 June 2012, please complete the following table.

Name of entity									
Status of opportunities identified to an accuracy of <u>better than</u> 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**	
As reported in December 2012	Under investigation								
Business response as at 30 June 2013	Implemented								
	Not to be Implemented								
	To be evaluated/reported in the second cycle								