

PUBLIC REPORT TEMPLATE 2013

Part 1 - Corporation details

Controlling corporation

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

Mackay Sugar Limited

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

Mackay Sugar Ltd (MSL) has three mills in the Mackay district and one at Mossman and has been a mandatory participant in the Australian Government's Energy Efficiency Opportunities (EEO) program since it was first introduced in July 2006. More than 90% of Mackay Sugar's total energy use is obtained from bagasse (a green waste and milling by-product), which provides both electricity and process steam. Provided there is adequate interconnection capacity excess energy or energy savings may be exported into the electricity grid as renewable energy.

Assessment of the yearly energy usage for MSL mills has shown that the reported energy use and efficiencies achieved can vary substantially from year to year due to many factors including weather, season length, cane characteristics, cane tonnage and cane quality (eg. Dirt loadings). Most of these are beyond the control of the mills but they impact on cane processing. The total energy use reported in this period was up from the previous report due to the wet harvest conditions early in the 2011 season.

In the last 12 months MSL has finished construction and commissioning of a large scale bagasse fired co-generation plant at the Racecourse Mill site to increase the current co-generation capacity and improve efficiencies of combustion by using a higher pressure boiler and a 37MW condensing turbo-alternator set. However this project was not included as a significant opportunity for Racecourse Mill under this Energy Efficiencies Opportunities program as it does not meet the criteria for providing payback within 4 years. This co-generation plant has been the catalyst for further bagasse efficiency projects at Farleigh and Marian Mills to increase the amount of excess bagasse made and therefore renewable energy to offset coal combustion at Racecourse Mill for the Racecourse Refinery operations.

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*.



Quinton Hildebrand
CEO

Date 13 DECEMBER 2013

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	Farleigh Mill	
Total energy use in the last financial year		4,504,792 GJ
Total percentage of energy use assessed when assessments were undertaken	99	%

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

The timing of assessments carried out by Mackay Sugar Ltd is continuing as planned under the approved Assessment and Reporting Schedule. During this reporting period 4 opportunities applicable to Farleigh Mill were assessed and one of these is being progressed through to Capital approval by the Board of MSL. Assessments were carried out with an accuracy of +/- 10% for energy savings due to the limitations with estimation of bagasse tonnage.

The energy assessments performed have been thorough and comprehensive utilising personnel from within Mackay Sugar. External consultants have been used to provide expertise with assessment and opportunity design and costing for specialised equipment such as boiler ancillaries and turbines. Mass and energy modelling was performed internally for all bagasse related opportunities. The boiler projects also included external modelling by other experts in the field. Assessed projects were ranked and those that merited it were submitted for CEA development including higher order costing for submission for capital funding as per the MSL capital procedures. Implemented projects were project managed by MSL personnel, or external contractors, and Project Management procedures were in place to monitor, track and evaluate progress of projects.

Employees have been kept up to date on the outcomes of the assessments by articles in the company newsletter and through the annual CEO address. During implementation the Board of MSL has also been kept informed of progress and variations required in implementation.

As indicated in the previous reports, greater than 90% of energy generated and used across Mackay Sugar is renewable as it is obtained from combustion of bagasse which is the fibrous part of the sugarcane plant. Electricity is generated on-site at Farleigh whilst crushing and any electricity excess to the site requirements can be exported into the grid, but the rate at which



this excess electricity can be fed into the grid is a limiting factor. Benefits of energy efficiency (bagasse energy) are lost once this export limit is reached and on line bagasse storage is no longer available. However, with boilers operating year round for the Refinery at Racecourse, the excess bagasse can be transported and stockpiled there to offset the use of coal in the non-crush period. There are also limits to the amount of bagasse that may be stored under regulatory approvals so for the most part, the energy efficiency opportunities assessed and implemented at Farleigh Mill have been associated with projects which demonstrate benefits across the organisation.

* Entity is group member, business unit, or key activity. Please note that, for individual sites that use more than 0.5 PJ 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	0							
Implementation commenced	0							
To be implemented	0							
Under investigation	4	2	539,000	2	521,000		1,060,000	
Not to be implemented	0							
Outcomes of assessment		2	539,000	2	521,000		1,060,000	
Total identified	4	2	539,000	2	521,000		1,060,000	

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

Table 2.1 – Assessment details

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

Name of entity	Marian Mill	
Total energy use in the last financial year	5,616,146	GJ
Total percentage of energy use assessed when assessments were undertaken	99	%

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

The timing of assessments carried out by Mackay Sugar Ltd is continuing as planned under the approved Assessment and Reporting Schedule. During this reporting period 7 opportunities applicable to Marian Mill were assessed, 2 were implemented and one will not be implemented. Assessments were carried out with an accuracy of +/- 10% for energy savings due to the limitations with estimation of bagasse tonnage.

The energy assessments performed have been thorough and comprehensive utilising personnel from within Mackay Sugar. External consultants have been used to provide expertise with assessment and opportunity design and costing for specialised equipment such as boiler ancillaries and turbines. Mass and energy modelling was performed internally for all bagasse related opportunities. The boiler projects also included external modelling by other experts in the field. Assessed projects were ranked and those that merited it were submitted for CEA development including higher order costing for submission for capital funding as per the MSL capital procedures. Implemented projects were project managed by MSL personnel, or external contractors, and Project Management procedures were in place to monitor, track and evaluate progress of projects.

Employees have been kept up to date on the outcomes of the assessments by articles in the company newsletter and through the annual CEO address. During implementation the Board of MSL has also been kept informed of progress and variations required in implementation.

As indicated in the previous reports, greater than 90% of energy generated and used across Mackay Sugar is renewable as it is obtained from combustion of bagasse which is the fibrous part of the sugarcane plant. Electricity is generated on-site at Marian whilst crushing and any excess to the site requirements can be exported into the grid but the rate at which this excess electricity can be fed into the grid is a limiting factor. Benefits of energy efficiency (bagasse energy) are lost once this export

limit is reached and bagasse storage is no longer available. However, with boilers operating year round for the Refinery at Racecourse, the excess bagasse can be transported and stockpiled there to offset the use of coal in the non-crush period. There are also limits to the amount of bagasse that may be stored under regulatory approvals so for the most part the energy efficiency opportunities assessed and implemented at Marian Mill have been associated with projects which demonstrate benefits across the organisation.

* Entity is group member, business unit, or key activity. Please note that, for individual sites that use more than 0.5 PJ 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 $\pm 30\%$	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	2	2	1,001,000					1,001,000
Implemented	0							
Implementation commenced	0							
To be implemented	4	3	717,000	1	10,000			727,000
Under investigation	1	1		1	146,000			146,000
Not to be implemented	7	4	1,718,000	3	156,000			1,874,000
Total identified								

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

Corporate groups are required to provide at least three 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	
<p>Upgrade #3 Marian Boiler:</p> <p>The Marian #3 Boiler Upgrade will restore this boiler to nameplate MCR capability and improve the efficiency from 58% to 67%, resulting in an extra 69,000 tonne surplus bagasse in a 24 week season. This work will offset potentially 21,000t coal burnt at Racecourse. This work will involve installation of an undergrate air heater, primary air heater and a 3 stage economiser. The total installation was \$9.5m.</p> <p>The success of this sub-project also depended on extra maintenance work on Marian #1 and #3 boilers, so that the inefficient Marian #2 Boiler can be decommissioned.</p>	Equipment type	Economiser
	Business response	Implemented
	Energy saved (GJ)	636,000 GJ
	Greenhouse gas abated (CO2-e)	59,500 t CO2-e
	\$ saved	
	Payback period	1.93 yrs

Description of opportunity No. 2	Voluntary Information	
<p>Expand Bagasse storage at Marian:</p> <p>The Marian bagasse storage has been expanded by 40,000 t to hold the extra bagasse generated. The extra storage will offset approximately 14,000 t coal at Racecourse. The project cost was \$3.2m.</p>	Equipment type	N/A
	Business response	Implemented
	Energy saved (GJ)	365,000 GJ
	Greenhouse gas abated (CO2-e)	34,000 t CO2-e
	\$ saved	
	Payback period	1.60 yrs

Description of opportunity No. 3	Voluntary Information	
<p>Upgrade #4 Farleigh Boiler:</p> <p>The Farleigh #4 Boiler Upgrade will improve the efficiency by up to 17% resulting in an extra 55,000 tonne surplus bagasse in a 24 week season. This will offset potentially 17,000t coal burnt at Racecourse. This work will involve installation of an undergrate air heater, secondary air heater, a 3 stage economiser and upgraded superheater tubing. The total installation is estimated at \$11m.</p>	Equipment type	Economiser
	Business response	Under Investigation
	Energy saved (GJ)	508,000 GJ
	Greenhouse gas abated (CO2-e)	48,000 t CO2-e
	\$ saved	
	Payback period	3.77 yrs

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.

Part 3 - Transition to second cycle

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

In December 2011, many corporations reported energy efficiency opportunities that were still under investigation as at 30 June 2011. 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.

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	
As reported in December 2011	Under investigation							
Business response as at 30 June 2012	Implemented							
	Not to be implemented							
	To be evaluated/reported in the second cycle							