

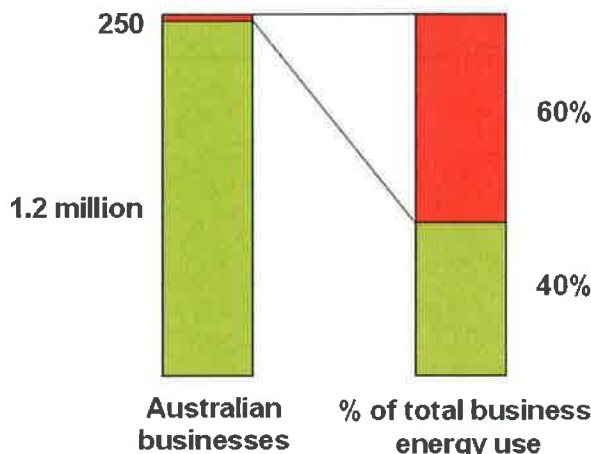
Millennium Inorganic Chemicals Limited – Asia / Pacific

2011 ENERGY EFFICIENCY REPORT

Millennium Inorganic Chemicals Limited – Asia / Pacific (Millennium or MIC) is a wholly owned subsidiary of Cristal Global and manufactures titanium dioxide (TiO₂) pigments for the coatings and plastics markets. Located in Bunbury, WA, MIC has operated for forty-eight years providing employment for over 300 people and injecting more than \$180 million per annum back into the local economy. MIC produces a high value added product, which supplies the Asia Pacific region with revenue in excess of \$300 million per annum.

MIC, with an annual energy usage across the two operating sites of approximately 2 Petajoules, has participated in the Australian Government's Energy Efficiency Opportunities (EEO) program since it was introduced in 2006. The intent of the EEO program is based on the figure¹ below which illustrates that any efficiency improvements by large users will have the most impact on the nation's energy needs. As a guide, a Petajoule is equivalent to annual consumption of about 28,000 households.²

Top 250 business energy use vs total business energy use



Historically, MIC has employed a continuous improvement approach to energy efficiency efforts. These efforts have drawn on the combined experience of many employees, from operators to engineers, and have complied with the intent and the key requirements of the Energy Efficiency Opportunities program. With appropriate metering, remote monitoring and routine collaboration, MIC's goal is to continue to identify opportunities for energy efficiency gains. This goal has been heightened this year with hikes in natural gas and electricity prices, and the upcoming carbon tax in July 2012, resulting in rescheduling of some opportunities.

While operating efficiently is a mature concept at MIC, assessments in the last four years identified over 30 worthy opportunities with an 8% improvement thus far in energy efficiency.

¹ Department of Resources, Energy and Tourism, Australian Government

² Based on 35 GJ per household, Energy Use In The Australian Residential Sector 1986-2020, Department of the Environment, Water, Heritage and the Arts

Table 1 MIC – Energy Summary

Total energy use (by bandwidth) in the last financial year	1.7 – 2.1	PJ
Energy use assessed in this entity as a percentage of total entity energy use*	98	%
Energy use assessed in this entity as a percentage of total corporate energy use	98	%

The major energy supplies have a high level of accuracy (+/- 1%) with good metering and weighbridge receipts. There are some minor energy contributions for transporting and warehousing that are not included.

Period over which assessment was undertaken		1/7/2006		30/6/2011
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Description of the way in which the entity carried out its assessment

The Manufacturing business unit conducted an assessment of the main production process that resulted in the optimisation of existing boiler operations, including start up and shut down, through changes to operating procedures and training. Improvements in metering and the completion of an energy mass balance on both sites identified additional opportunities to save energy. The resulting energy savings are reported in Table 2 of this report.

In addition, the progressing of this program has resulted in energy efficiency considerations being better integrated into the range of existing business improvement and approval processes.

Table 2 MIC – Bunbury Operations

Status of opportunities identified to an accuracy of better than or equal to $\pm 30\%$		Number of opportunities	Estimated savings per annum by payback period (GJ)				Total estimated energy savings per annum (GJ)
			0 – < 2 years		2 – \leq 4 years		
			No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	6	5	73300	1	21000	94300
	Implementation Commenced	3	3	30000			30000
	To be Implemented	2	2	12000			12000
	Under Investigation	2	1	100	1	5000	5100
	Not to be Implemented ³	2	2	30000			30000
Outcomes of assessment	Total Identified	15	13	145400	2	26000	171400
Status of opportunities identified to an accuracy of worse than $\pm 30\%$							
Business Response	Implemented	13	9	41000	4	5000	46000
	Implementation Commenced	1	1	50			50
	To be Implemented	2	1	2000	1	100000	102000
	Under Investigation	9	6	65500	3	300	65800
	Not to be Implemented						
Outcomes of assessment	Total Identified	25	17	108550	8	105300	213850

Examples of Opportunities identified.

Opportunity 1
Maintaining steam traps and leaks. Steam is the main source of energy across the manufacturing sites. Working with the supplier we were able to highlight the value of energy lost through steam traps and minor leaks. New steam traps have been fitted with routine maintenance schedules. 22,000 GJ/yr saving.
Opportunity 2
Optimizing final milling conditions: Maximizing milling conditions when on-line and further reducing steam demand when not feeding the mills has resulted in real savings without compromising pigment quality. 53,000 GJ/yr saving.

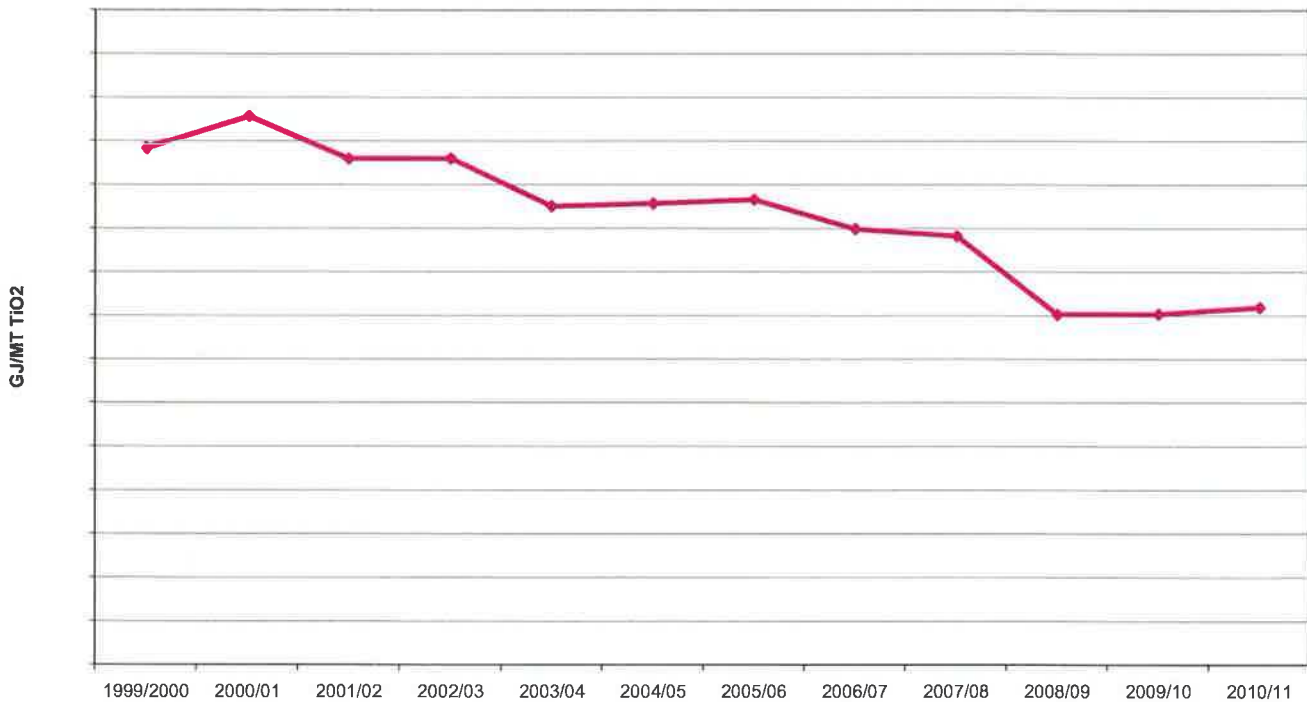
³ One opportunity discontinued due to excessive process unit wear. Another not implemented due to potential impact on pigment quality

Opportunity 3

New burners fitted to some boilers and process heaters. While these burners allowed for dual fuel use (natural gas and diesel), they also provided a 2% gain in efficiency on natural gas.
21,000 GJ/yr saving.

Millennium will continue to strive for excellence in energy efficiency as it does in all areas of manufacturing. The identified opportunities will add to the improved efficiencies seen prior to the introduction of the Energy Efficiency Opportunities legislation.

Energy Consumption at the Bunbury Operations



Board Review

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*.

Simon Morten – Director of Manufacturing
 Asia / Pacific.
 30 December 2011