



Australian Government

Department of Resources, Energy and Tourism

**Energy Efficiency**  
Opportunities

# **BRICKWORKS**

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**LIMITED**

## **Energy Efficiency Opportunities Report**

**Controlling Corporation**

**Brickworks Limited**

**Period to which this report relates**

**Start 1<sup>st</sup> July 2006      End 30<sup>th</sup> June 2011**



The Brickworks Group understands and accepts its responsibility for environmental protection which is integral to the conduct of its commercial operations. Brickworks' objective is to comply with all applicable environmental laws and regulations and community standards in a commercially effective way. We are committed to encouraging concern and respect for the environment and emphasising every employee's responsibility for environmental performance. During the year, in excess of \$1.5 million was spent on capital projects aimed at improving our environmental performance or rehabilitating operational sites. In addition, construction of the new Wollert West factory, worth \$65.0 million, is nearing completion. This state of the art manufacturing facility will replace two existing manufacturing facilities, resulting in substantial energy and emission improvements. When fully operational, overall energy consumption and greenhouse gas emissions are expected to reduce by over 40% at Austral Bricks Victoria.

In preparing for a price on carbon, managing energy use, emissions and associated costs have been integral to our operations. Brickworks actively participates in energy efficiency and greenhouse gas reporting schemes which have assisted in the improvement of systems and processes for data capture and storage, measuring and calculating emissions and implementing energy saving initiatives. These programs include:

- Energy Efficiency Opportunities (EEO) Act 2006 – this programme encourages large energy users to implement management systems aimed at measuring and analysing energy usage within their plants and identifying and implementing energy reduction strategies. All of the largest Brickworks sites covering over 90% of Brickworks total energy consumption have been assessed and had energy audits undertaken to Level 2 status.
- National Greenhouse and Energy Reporting (NGER) Act 2007 – this programme requires organisations to measure and report their energy consumption, production and greenhouse gas emissions under strict protocols. Brickworks has been measuring its energy consumption and emissions for some 15 years and this program has assisted Brickworks to streamline its processes for data capture, measuring, calculating and reporting energy and emissions. The data is subsequently collated and reported monthly to Senior Management and the Board.
- National Pollution Inventory (NPI) – The NPI provides the government, community and industry with information to substances and emissions estimates for 93 toxic substances. Brickworks have been fulfilling its mandatory reporting requirements under this scheme.
- Environment and Resource Efficiency Program (EREP) – this programme was established by the Environment Protection Act 2006 (Victoria only) to assist the state's largest energy and water users to achieve financial benefits by assessing their resource use efficiency (energy, water and materials use and waste generation). While many of the energy saving projects are already covered in Brickworks' EEO submission, water and resource saving and waste reduction initiatives have also been committed to.
- Energy Saving Action Plans (ESAP) – this program is administered by the NSW Office of Environment & Heritage and requires large energy users in NSW to submit a detailed energy efficiency plan and subsequent annual progress reports.

Brickworks' has been assisting industry participants in the delivery of energy efficient housing through the supply of innovative building materials and extensive research and development programs. Jade Projects, Right Homes and Brickworks partnered on a product development journey to prove that sustainability and affordability can go hand-in-hand. The result was the JADE 909, a 9 Star Rated project home in Western Australia. The Jade 909 uses 119% less energy and 76% less water than an average Perth home and subsequently won the 2010 HIA Greensmart Project Home Award. Brickworks supplied the clay bricks resulting in lower energy demand for heating and cooling due to their thermal mass properties and contributed to research on construction types, climatic zones and building orientations.

Brickworks are a Housing Industry Australia (HIA) Green Smart Leader and support research on Thermal Performance and Life Cycle Analysis of Australian Housing in association with the University of Newcastle. On that, the University of Newcastle & Think Brick recently published their findings from 8 years of research with conclusive evidence that houses built with Bricks and their inherent thermal mass properties have far superior energy efficiency performance compared to housing constructed from lighter weight materials.



# PUBLIC REPORT 2011

## Part 1 - Corporation Details

### Controlling Corporation

### Period to which this report relates

Insert the name of the Controlling Corporation exactly as it is registered with the EEO Program. The period to which the report relates is the total period of participation up to 30 June prior to when the report is due.

Brickworks Limited From 1 July 2006 To 30 June 2011

### Table 1.1 - Major Changes to Corporate Group Structure or Operations

Table 1.1 – Major Changes to Corporate Group Structure or Operations	
<p>During the last 12 months, a number of divisions have made acquisitions and grown their business. A Masonry Block Plant was acquired in NSW as were 4 Precast Concrete Panel Plants (one in each of NSW, Qld, Vic &amp; WA).</p> <p>The global economy has led to reduced demand for building products, particularly Bricks with production levels reducing dramatically across the Corporate Group. A number of Plants have been earmarked for closure, with mandatory shutdowns occurring at most plants to reduce excess stock levels. A massive cost reduction effort has been implemented accros the group, leading to the unfortunate reduction in employee levels by some 15%. This economic downturn has hampered our ability to raise capital, even for projects with compelling paybacks.</p> <p>The consolidation of the Victorian Brick Division is continuing to plan with the shutdown of our most energy intensive plants and replacement with state of the art energy efficient technology, which will decrease the energy intensity.</p>	

### Table 1.2 – Aggregate energy assessed covered in this report

Total energy use covered by all assessments in this report	5,627,459	GJ
Total energy assessed as percentage of total energy use of the corporate group	91.3	%



## 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*.

Lindsay Partridge  
Managing Director

**Date**



## Part 2 - Assessment Outcomes

### Table 2.1 – Assessment Details

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

Brickworks Limited senior management established an EEO Steering Committee to assist the organisation meet its obligations under the EEO legislation. The primary role of the Committee is to ensure that the organisation meets the 6 key elements of the EEO program. The commitment by senior management in forming this committee forms the basis of meeting the “leadership element”.

Under the guidance of the Steering Committee Brickworks Limited has undertaken its final Energy Efficiency Opportunities Assessment for the following plant for the 2010 - 2011 period:

- Austral Bricks WA - Armidale

The result is that Brickworks have now assessed 20 facilities since 2007 and approximately 91.3% of our total energy consumption.

Brickworks Limited administered an independent Energy Consultancy to facilitate the undertaking of assessments of our plants to identify where energy was being used and look for energy saving opportunities in compliance with EEO legislation.

The assessment of the above plants included the following process steps:

- Identifying an energy and production baseline;
- Conducting a site management review to identify current energy management policies and procedures;
- Conducting a site technical review to compile an energy mass balance, energy use by sub-activity, specific energy indexes by main energy use and efficiency and savings opportunities.
- The audits and management reviews were undertaken between July 2010 & June 2011

Brickworks Limited has set up a Cross Functional Team to address energy efficiency matters. This team incorporates managerial staff, operational managers, environmental managers, engineers and technical managers with appropriate skills and expertise to analyse energy and process data. This team meets the “people element” required under EEO regulations. The team interacts with Brickworks Limited’s alliance partners and onsite contractors.

The Cross Functional Team reviews recommendations made in the audits. Projects are ranked according to payback period and projects with a feasible internal rate of return are analysed in detail to ensure that management have sufficient information to make informed decisions as to whether or not a project has or will be implemented. The team also monitors the progress of the energy savings initiatives and undertakes a formal review process to evaluate projects post implementation. The team continually seeks energy efficiency ideas from the site to ensure the process is on going. The outcomes of its findings are reported to the EEO Steering Committee.

The EEO Steering Committee disseminates EEO and energy information to senior management and to the sites, with the aim of increasing energy efficiency awareness across the organisation.

The summary of the assessment and review process can be found below in the following sections:



**Name of group member or business unit or key activity**

*Austral Bricks WA - Armadale*

Total energy use in the last financial year

337,823

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

98.9

%

Energy use assessed in this entity as a percentage of total corporate energy use

5.4

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2010

30/6/2011

**Name of group member or business unit or key activity**

*Bristle Roofing WA - Caversham*

Total energy use in the last financial year

206,052

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

98.8

%

Energy use assessed in this entity as a percentage of total corporate energy use

3.3

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2009

30/6/2010

**Name of group member or business unit or key activity**

*Austral Bricks WA - Malaga*

Total energy use in the last financial year

308,229

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

96.6

%

Energy use assessed in this entity as a percentage of total corporate energy use

4.8

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2009

30/6/2010



**Name of group member or business unit or key activity**

*Austral Bricks WA - Cardup*

Total energy use in the last financial year

333,913

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

98.3

%

Energy use assessed in this entity as a percentage of total corporate energy use

5.3

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2009

30/6/2010

**Name of group member or business unit or key activity**

*Austral Bricks WA - Bellevue*

Total energy use in the last financial year

452,487

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

98.4

%

Energy use assessed in this entity as a percentage of total corporate energy use

4.3

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2009

30/6/2010

**Name of group member or business unit or key activity**

*Austral Bricks SA – Golden Grove*

Total energy use in the last financial year

271,828

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

98.4

%

Energy use assessed in this entity as a percentage of total corporate energy use

4.3

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2009

30/6/2010



**Name of group member or business unit or key activity**

*Austral Bricks NSW - Punchbowl*

Total energy use in the last financial year

85,033	GJ
--------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

99.1	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

1.4	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2009	30/6/2010
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**Name of group member or business unit or key activity**

*Austral Bricks NSW - Bowral*

Total energy use in the last financial year

408,325	GJ
---------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

98.8	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

6.5	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
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Period over which assessment was undertaken

1/7/2009	30/6/2010
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**Name of group member or business unit or key activity**

*Bristle Roofing Qld - Wacol*

Total energy use in the last financial year

10,370	GJ
--------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

77.8	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

0.1	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2009	30/6/2010
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**Name of group member or business unit or key activity**

*Austral Bricks Qld - Riverview*

Total energy use in the last financial year

132,507	GJ
---------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

98.6	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

2.1	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2009	30/6/2010
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**Name of group member or business unit or key activity**

*Austral Bricks Qld - Rochedale*

Total energy use in the last financial year

290,328	GJ
---------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

95.5	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

4.5	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2009	30/6/2010
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**Name of group member or business unit or key activity**

*Austral Bricks Vic - Craigieburn*

Total energy use in the last financial year

882,595	GJ
---------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

95.2	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

13.6	%
------	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2008	30/6/2009
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**Name of group member or business unit or key activity**

*Austral Bricks Vic - Wollert*

Total energy use in the last financial year

526,988

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

95.7

%

Energy use assessed in this entity as a percentage of total corporate energy use

8.2

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2008

30/6/2009

**Name of group member or business unit or key activity**

*Austral Bricks Vic - Summerhill*

Total energy use in the last financial year

394,058

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

95.2

%

Energy use assessed in this entity as a percentage of total corporate energy use

6.1

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2008

30/6/2009

**Name of group member or business unit or key activity**

*Brickworks Limited - Corporate Car Policy*

Total energy use in the last financial year

47,925

GJ

Energy use assessed in this entity as a percentage of total entity energy use\*

100

%

Energy use assessed in this entity as a percentage of total corporate energy use

0.8

%

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

%

Period over which assessment was undertaken

1/7/2008

30/6/2009



**Name of group member or business unit or key activity**

*Austral Bricks NSW – Plant 1 Horsley Park*

Total energy use in the last financial year

486,122	GJ
---------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

94.0	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

7.4	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2006			
----------	--	--	--

			30/6/2008
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**Name of group member or business unit or key activity**

*Austral Bricks NSW – Plant 2 Horsley Park*

Total energy use in the last financial year

10,182	GJ
--------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

59.1	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

0.1	%
-----	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2006			
----------	--	--	--

			30/6/2008
--	--	--	-----------

**Name of group member or business unit or key activity**

*Austral Bricks NSW – Plant 3 Horsley Park*

Total energy use in the last financial year

637,001	GJ
---------	----

Energy use assessed in this entity as a percentage of total entity energy use\*

98.1	%
------	---

Energy use assessed in this entity as a percentage of total corporate energy use

10.1	%
------	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

1/7/2006			
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			30/6/2008
--	--	--	-----------



**Name of group member or business unit or key activity**

*Austral Bricks Vic - Scoresby*

Total energy use in the last financial year

0	GJ
---	----

Energy use assessed in this entity as a percentage of total entity energy use\*

0	%
---	---

Energy use assessed in this entity as a percentage of total corporate energy use

0	%
---	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

	1/7/2006		30/6/2008
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**Name of group member or business unit or key activity**

*Eureka Tiles Vic - Ballarat*

Total energy use in the last financial year

0	GJ
---	----

Energy use assessed in this entity as a percentage of total entity energy use\*

0	%
---	---

Energy use assessed in this entity as a percentage of total corporate energy use

0	%
---	---

Accuracy of above estimates related to energy use assessed - only required if not ±5% or better

	%
--	---

Period over which assessment was undertaken

	1/7/2006		30/6/2008
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### Table 2.2 - Energy efficiency opportunities identified in the assessment

It is compulsory to complete a separate table for each group member, business unit, or key activity that has been assessed

All identified opportunities have been assessed with accuracy greater +/- 30%

#### Austral Bricks WA - Armadale

Table 2.2 – Energy efficiency opportunities identified in the assessment									
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								
	Implementation Commenced								
	To be Implemented	8	4	17,989	3	288	1	31	18,308
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	8	4	17,989	3	288	1	31	18,308

#### Bristle Roofing WA - Caversham

Table 2.2 – Energy efficiency opportunities identified in the assessment									
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	1		278					278
	Implementation Commenced								
	To be Implemented	4		25,513					25,513
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	5		25,791					25,791



### Austral Bricks WA - Malaga

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1			1	14,421			14,421
	Implementation Commenced								
	To be Implemented	8	5	6,731	3	1,546 <sup>^</sup>			8,277
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	9		6,731		15,967			22,698

<sup>^</sup> One of these projects relates to lowering electrical demand (kVA) for the Crusher and Hammer Mill which results in zero energy savings in GJ.

### Austral Bricks WA - Cardup

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented								
	Implementation Commenced								
	To be Implemented	6	5	7,122 <sup>#</sup>	1	321			7,443
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	6	5	7,122	1	321			7,443

<sup>#</sup> One of these projects relates to introducing Peak electrical demand control (kVA) resulting in zero energy savings in GJ



### Austral Bricks WA - Bellevue

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	2	2	407					407
	Implementation Commenced								
	To be Implemented	6	5	7,696 <sup>^</sup>	1	692			8,388
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	8	8	8,103		692			8,795

<sup>^</sup> One of these projects relates to lowering electrical demand (kVA) for the Crusher and Hammer Mill which results in zero energy savings in GJ

### Austral Bricks SA – Golden Grove

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1					1	7,660	7,660
	Implementation Commenced	4	3	21,790	1	299			22,089
	To be Implemented	1	1	209					209
	Under Investigation	3			2	196 <sup>^</sup>	1	0 <sup>#</sup>	196
	Not to be Implemented	0							
Outcomes of assessment	Total Identified	9	4	21,999	3	495	2	7,660	30,154

<sup>^</sup> One of these projects relates to lowering electrical demand (kVA) for the Crusher and Hammer Mill which results in zero energy savings in GJ

<sup>#</sup> This project relates to Power Factor Correction and reducing electrical demand (kVA) of the site resulting in zero energy savings in GJ



### Austral Bricks NSW - Punchbowl

<b>Table 2.2 – Energy efficiency opportunities identified in the assessment</b>									
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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented								
	Implementation Commenced								
	To be Implemented	0							
	Under Investigation	6	2	397	1	233	3	1,995 <sup>^#</sup>	2,625
	Not to be Implemented	1					1	60	60
Outcomes of assessment	Total Identified	7	2	397	1	233	4	2,055	2,685

<sup>^</sup> One of these projects relate to lowering electrical demand (kVA) for the Crusher & Hammer Mill which results in zero energy savings in GJ

<sup>#</sup> One of these projects relate to Power Factor Correction and reducing electrical demand (kVA) of the site resulting in zero energy savings in GJ

### Austral Bricks NSW - Bowral

<b>Table 2.2 – Energy efficiency opportunities identified in the assessment</b>									
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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1			1	0 <sup>#</sup>			0
	Implementation Commenced	0							
	To be Implemented	1	1	317					317
	Under Investigation	5	3	12,380	2	214 <sup>^</sup>			12,594
	Not to be Implemented	1					1	3,978	3,978
Outcomes of assessment	Total Identified	8	4	12,697	3	214	1	3,978	16,889

<sup>^</sup> One of these projects relate to lowering electrical demand (kVA) for the Crusher & Hammer Mill which results in zero energy savings in GJ

<sup>#</sup> This project relates to Power Factor Correction and reducing electrical demand (kVA) of the site resulting in zero energy savings in GJ





### Bristle roofing Qld - Wacol

Table 2.2 – Energy efficiency opportunities identified in the assessment									
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	1	1	2,167					2,167
	Implementation Commenced	2	2	71					71
	To be Implemented								
	Under Investigation	2			1	0 <sup>^</sup>	1	56	56
	Not to be Implemented	3	1	52 <sup>#</sup>	1	155	1	66	273
Outcomes of assessment	Total Identified	8	4	2,290	2	155	2	122	2,567

<sup>^</sup> This project relates to Power Factor Correction and reducing electrical demand (kVA) of the site resulting in zero energy savings in GJ

<sup>#</sup> This project relates to an electric motor optimisation program and will not be implemented. A project relating to the replacement of all electric motors with super efficient motors on a replacement basis will supersede it.

### Austral Bricks Qld - Riverview

Table 2.2 – Energy efficiency opportunities identified in the assessment									
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								
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented	6	4	12,993 <sup>^</sup>	2	379			13,372
Outcomes of assessment	Total Identified	6	4	12,993	2	379			13,372

<sup>^</sup> One of these projects relates to lowering electrical demand (kVA) for the Crusher & Hammer Mill which results in zero energy savings in GJ

This plant will be shutdown at the end of 2011 due to surplus capacity in the Qld brick industry



### Austral Bricks Qld - Rochedale

<b>Table 2.2 – Energy efficiency opportunities identified in the assessment</b>									
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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented								
	Implementation Commenced	6	4	27,672 <sup>^</sup>	2	1,147 <sup>#</sup>			28,819
	To be Implemented								
	Under Investigation	1	1	242					242
	Not to be Implemented	1					1	190	190
Outcomes of assessment	Total Identified	8	5	27,914	2	1,147	1	190	29,251

<sup>^</sup> One of these projects relate to lowering electrical demand (kVA) for the Crusher & Hammer Mill which results in zero energy savings in GJ

<sup>#</sup> One of these project relates to Power Factor Correction and reducing electrical demand (kVA) of the site resulting in zero energy savings in GJ

### Austral Bricks Vic - Craigieburn

<b>Table 2.2 – Energy efficiency opportunities identified in the assessment</b>									
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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented								
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented	6	2	1,333	2	116,388	2	0	117,721
Outcomes of assessment	Total Identified	6 <sup>^</sup>	2	1,333	2	116,388	2	0	117,721

<sup>^</sup> Craigieburn will be shut down with the commissioning of Wollert West, a state of the art, energy and resource efficient plant which will incorporate the latest energy saving plant and technologies. The shutdown is expected by end of 2012



### Austral Bricks Vic - Summerhill

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented								
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented	6	2	1,093	2	81,576	2	0	82,669
Outcomes of assessment	Total Identified	6 <sup>^</sup>	2	1,093	2	81,576	2	0	82,669

<sup>^</sup> Summerhill has now been shut down

### Austral Bricks Vic - Wollert

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented								
	Implementation Commenced	1 <sup>^</sup>					1	0	0
	To be Implemented								
	Under Investigation	2			1	474	1	0*	474
	Not to be Implemented								
Outcomes of assessment	Total Identified	3			1	474	2	0	474 <sup>#</sup>

<sup>^</sup> This opportunity relates to a business process change, namely the establishment of enhanced energy monitoring equipment and results in zero energy savings. This will assist the organisation in identifying and quantifying future efficiency improvements.

\*Portable process monitoring kit to refine operations and fine tune combustion and balance of kilns – This will assist the organisation in identifying and quantifying future efficiency improvements

<sup>#</sup> Wollert is a purpose built, state of the art facility commissioned last year incorporating the latest energy saving plant and technologies and arguably one of the most energy efficient brick plants in the southern hemisphere, limiting the opportunity of identifying cost effective energy savings.



### Brickworks Limited – Corporate Car Policy

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1 <sup>^</sup>	1	0					0
	Implementation Commenced	1	1	1,815					1,815
	To be Implemented								
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	2	2	1,815					1,815

<sup>^</sup> This opportunity relates to a business process change, namely the implementation strategy and reporting database supporting our fuel savings initiative and results in zero energy savings. This will assist the organisation in identifying and quantifying efficiency improvement in the future.

### Austral Bricks Vic - Scoresby

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1	1	555,558					555,558
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	1 <sup>^</sup>	1	555,558					555,558

<sup>^</sup> This opportunity relates to the shutdown of Scoresby. As previously reported Scoresby was replaced by Wollert, a purpose built, state of the art facility commissioned last year and incorporating the latest energy saving plant and technologies and arguably one of the most energy efficient brick plants in the southern hemisphere.



### Austral Bricks NSW – Plant 1 Horsley Park

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	3	1	1,365	2	173			1,538
	Implementation Commenced	0							
	To be Implemented	0							
	Under Investigation	0							
	Not to be Implemented	3			3	356			356
Outcomes of assessment	Total Identified	6	1	1,365	5	529			1,894

### Austral Bricks NSW – Plant 2 Horsley Park

**Table 2.2 – Energy efficiency opportunities identified in the assessment**

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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
13Business Response	Implemented	1 <sup>^</sup>	1	162,913					162,913
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	1	1	162,913					162,913

<sup>^</sup> This opportunity relates to the shutdown of Plant 2. The energy savings reported are the plants energy use prior to closure less any energy required to maintain security, lighting and other essential services. The energy use for the current reporting period includes maintaining security, lighting and other essential services and ad-hoc maintenance related works.



### Austral Bricks NSW – Plant 3 Horsley Park

<b>Table 2.2 – Energy efficiency opportunities identified in the assessment</b>									
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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1	1	32					32
	Implementation Commenced	0							
	To be Implemented	0							
	Under Investigation	0							
	Not to be Implemented	5	1	424	2	929	2	152	1,505
Outcomes of assessment	Total Identified	6	2	456	2	929	2	152	1,537

### Eureka Tiles Vic - Ballarat


<b>Table 2.2 – Energy efficiency opportunities identified in the assessment</b>									
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 – $\leq$ 4 years		> 4 years		
			No of Opps	GJ	No of Opps	GJ	No of Opps	GJ	
Business Response	Implemented	1					1	60,263	60,263
	Implementation Commenced								
	To be Implemented								
	Under Investigation								
	Not to be Implemented								
Outcomes of assessment	Total Identified	1					1	60,263	60,263

Ballarat has been shutdown



**Table 2.3 - Details of significant opportunities identified in the assessment**

The 3 significant opportunities reported below have been identified and assessed under the Brickworks EEO processes but do not relate to the final Assessment undertaken in 2010/2011 at Armadale.

Description of Opportunity
<p><b>Energy Efficient Burner Upgrade at Austral Bricks NSW Plant 1</b></p> <p>The majority Brickworks energy consumption can be attributed to the combustion of natural gas for firing bricks. So kiln efficiency is always a focus for reducing energy and greenhouse gas emissions. A number of initiatives were carried out to reduce energy consumption and associated costs. Austral Bricks in NSW commissioned new high efficiency burners in the kiln firing zone at Plant 1. This project resulted in numerous benefits including a 15% productivity improvement (push-rate) and similar energy savings per unit of production. With improved kiln control, noticeable improvements in quality have resulted with defects reducing by over 50%.</p> 



### Description of Opportunity

#### Replaced Air Compressors – Austral Masonry Port Kembla

Electricity consumed to provide compressed air for our Port Kembla Masonry site accounted for over 18% of total electricity consumption. A detailed compressed air study identified an opportunity to replace two old Champion compressors on load/unload cycles with 1 x 37kW VSD (main compressor) & 1 x 37kW load/unload (as a backup). The project has resulted in specific energy consumption decreasing from 29.88kWh/m<sup>3</sup>/min to 6.14 kWh/m<sup>3</sup>/min, a massive 79% reduction in electricity consumption.







### Description of Opportunity

#### The closure of Brickworks two most energy intensive plants in Victoria

Two Victorian brick manufacturing facilities will be mothballed and replaced by one state of the art, energy efficient plant. The new Plant incorporates the latest energy efficient technologies and will be similar to the newly commissioned Wollert 1 plant which has specific energy intensity of 6.2GJ/000'SBE. In comparison to the Plants it replaces have the following energy intensities:

- Summer Hill - has been decommissioned and was producing at 21GJ/000'SBE
- Craigieburn – operating at less than 50% capacity and producing at 14.3GJ/000'SBE.

Total energy savings for similar production outputs are projected at over 40%.

