

Energy Efficiency Opportunities Public Report 2011

Rio Tinto Limited

Controlling Corporation

Rio Tinto Limited

Period to which this report relates

Start 1 January 2011

End 30 June 2011

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

In Australia, there are three Rio Tinto associated controlling corporations that have obligations under the Energy Efficiency Opportunities (EEO) Act, 2006. These are: Rio Tinto Limited, Alcan Gove Pty Limited and Pechiney Consolidated Australia Pty Limited (Tomago Aluminium). This report covers the EEO reporting obligations for Rio Tinto Limited.

Three assessments were conducted within Rio Tinto Limited in 2007, four assessments were conducted in 2008, twelve assessments were conducted in 2009 and eight assessments were conducted in 2010. This is the fifth public report for Rio Tinto Limited and it provides an update on the progress of the assessments undertaken during the first EEO assessment cycle. One assessment, Hlsmelt[®] Operations was not undertaken during the first EEO assessment cycle because in 2008 the plant was placed on care and maintenance and has subsequently been decommissioned.

Rio Tinto Limited completed all required assessments for the EEO first assessment cycle by the end of 2010. The assessments have been carried out in line with Rio Tinto's Assessment and Reporting Schedule (A&RS).

Rio Tinto had a number of mechanisms in place to support the quality of assessments:

- the Rio Tinto assessments were facilitated by external consultants and involved local operational personnel as well as corporate staff from business units;



- site based EEO champions completed two-monthly updates on the progress of assessments and/or the further investigation and implementation of identified opportunities. These two-monthly updates were reported through to Rio Tinto management; and
- upon completion of each assessment, an internal quality review was conducted. This involved completion of a compliance checklist by each operation, review of assessment reports and public report data by the Energy and Climate Strategy group and confirmation by senior site management of the actions that will be taken to further improve the quality of energy data and to progress the detailed investigation and implementation of identified opportunities.

In 2010 Rio Tinto requested and the Department approved that annual reporting be changed from a calendar year to a July to June financial year basis. This report for the first six months of 2011 is necessary to implement this change.

During 2011 Rio Tinto participated in a verification by the Department of its EEO activities. The verification was undertaken under Section 24 of the Energy Efficiency Opportunities Act.

Part three of this report (Voluntary Contextual Information) provides a summary of progress and overall achievements to date under the programme. Maintaining and improving energy efficiency performance is important within Rio Tinto and EEO is assisting. Work under EEO is becoming integrated with Rio Tinto's broader energy efficiency and energy management programme. Collaborative learning of ways to improve energy efficiency is occurring between EEO and broader Group energy efficiency programmes

Table 1.2 – Energy use assessed

Business unit that has had an assessment completed by the end of this reporting period	Site that has had an assessment completed by the end of this reporting period	Period over which the assessment was undertaken	Energy use per annum in GJ in the current reporting year*
Argyle Diamond Mine	Argyle Diamond Mine	July to December 2009	1,634,300
Energy Resources of Australia	Ranger Mine	July to December 2008	1,359,000
Northparkes Mines	Northparkes Mines	June to November 2007	901,600
Rio Tinto Alcan	Boyne Smelters Limited	January to June 2008	31,501,600
	Rio Tinto Alcan Bell Bay	June to November 2007	10,532,000
	Rio Tinto Alcan Weipa	July to December 2007	1,990,800
	Rio Tinto Alcan Yarwun	July to December 2008	17,538,800
Rio Tinto Alcan total			61,563,300
Rio Tinto Coal Australia	Bengalla Mine	January to June 2009	1,179,000
	Blair Athol Mine	January to June 2009	397,800
	Hail Creek Mine	January to June 2009	3,305,400
	Hunter Valley Operations	January to June 2009	4,364,100
	Kestrel Mine	January to June 2009	419,500
	Mount Thorley Warkworth Operations	January to June 2009	3,817,600
Rio Tinto Coal Australia total		January to June 2009	13,483,400
Rio Tinto Iron Ore	Brockman No 2 / Nammuldi Mines	July to December 2010	1,002,100
	Cape Lambert Port Operations	July to December 2010	1,351,300
	Dampier Port Operations	July to December 2010	841,300
	Dampier Power Station, Paraburdoo Power Station, Cape Lambert Power Station	July to December 2009	9,539,700
	Hope Downs Mine	January to June 2010	1,859,300
	Marandoo Mine	January to June 2009	783,200
	Mesa J Mine	January to June 2010	640,100



Table 1.2 – Energy use assessed

Business unit that has had an assessment completed by the end of this reporting period	Site that has had an assessment completed by the end of this reporting period	Period over which the assessment was undertaken	Energy use per annum in GJ in the current reporting year*
Rio Tinto Iron Ore	Paraburdoo Mine, Channar & Eastern Ranges Mine	July to December 2008	1,865,800
	Pilbara Iron Rail Operations	July to December 2010	6,517,900
	Tom Price Mine	January to June 2009	2,989,000
	West Angelas Mine	July to December 2010	2,486,500
	Yandicoogina Mine	July to December 2010	1,938,400
Rio Tinto Iron Ore total			31,814,600
Total energy assessed*			110,756,100
Total energy use of the group in the current reporting year*			116,814,200
Total energy assessed expressed as a percentage of total current energy use			95%

*Any discrepancies are related to rounding.

Note:

Energy use is financial year 2011 (1 July 2010 to 30 June 2011).

Total energy assessed is calculated by summing the current year energy use for each assessed site (as assessments cover 100 per cent of site energy use). Energy use at individual sites vary year on year. Hence reported assessed energy may also vary year on year.

Energy use excludes the consumption of anodes, used as reductants in the smelting process, which embody an additional 11,272,000GJ. Energy use includes energy losses from the generation of electricity.

Rio Tinto Alcan Yarwun used a fuel specific energy factor for calculating the energy from coal consumption used in the refining process. The energy factor 18.46GJ/tonne was calculated from coal consumption data based on supplier information.

Part 1 – Information on assessments completed to date (continued)

Table 1.3 – Accuracy of energy use data		
Entity	% achieved	Reasons for not achieving data accuracy to within $\pm 5\%$

In 2009 Rio Tinto reported that the uncertainty for the electricity supplied to the Tom Price and Marandoo Mines was possibly greater than ± 5 per cent, noting that the diesel use, fully metered, represents more than 80 per cent of the sites energy use. A metering project to improve the electricity metering at the Pilbara operations is well underway. Revenue class energy metering compliant to the region's metering code was installed at the Tom Price and Marandoo Mines in 2010.

Part 2 – Energy Efficiency Opportunities that have been identified and evaluated

Based on the definition in the EEO Reporting templates, Rio Tinto's understanding of an 'opportunity' is *any potential change to a system, activity or piece of equipment that:*

- is identified during an EEO assessment;
- is consistent with legal requirements such as Occupational Health and Safety, and
- may result in energy savings projects with payback periods of four years or less.



Part 2 consists of tables with updated information about the twenty seven assessments reported in previous public reports¹. All tables in Part 2 have been prepared from individual site information aggregated to the Business Unit level. Additional information is available at the Rio Tinto website that provides site by site breakdown of the Business Units' aggregated tables in this Part. The sites within each Rio Tinto Australian Business Unit structure are listed below and in Table 1.2.

The tables list the status of the energy efficiency opportunities that Rio Tinto is tracking at the end of the reporting period (1 Jan 2011 to 30 June 2011). In addition, identified opportunities that currently have a greater than four year payback, but are considered to have the potential to have less than a four year payback, following additional investigation, are also reported.

Tables 2.3 and 2.4 (Part 2B) provide Business Unit data regarding EEO assessments completed during previous reporting periods:

- Argyle Diamond Mine
 - Argyle Diamond Mine
- Energy Resources of Australia
 - Ranger Mine
- Northparkes Mines
 - Northparkes Mines
- *Rio Tinto Alcan*
 - Boyne Smelters Limited
 - Rio Tinto Alcan Bell Bay
 - Rio Tinto Alcan Weipa
 - Rio Tinto Alcan Yarwun
- Rio Tinto Coal Australia
 - Bengalla Mine
 - Blair Athol Mine
 - Hail Creek Mine
 - Hunter Valley Operations
 - Kestrel Mine
 - Mount Thorley Warkworth Operations
- Rio Tinto Iron Ore
 - Brockman No 2 / Nammuldi Mines
 - Cape Lambert Port Operations
 - Dampier Port Operations
 - Dampier Power Station, Paraburdoo Power Station, Cape Lambert Power Station
 - Hope Downs Mine
 - Marandoo Mine
 - Mesa J Mine
 - Paraburdoo Mine, Channar & Eastern Ranges Mine
 - Pilbara Iron Rail Operations
 - Tom Price Mine
 - West Angelas Mine
 - Yandicoogina Mine

¹ Energy Efficiency Opportunities Public Reports 2007, 2008, 2009 and 2010 – Rio Tinto Limited

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: **Argyle Diamond Mine**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

1,634,300	GJ
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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	11	600	<50	3,100	3,700
Business Response**	Under Investigation	0	0	0	0	0
	To be Implemented	2	100	0	100	100
	Implementation Commenced	2	300	0	900	1,200
	Implemented	5	200	<50	2,000	2,200
	Not to be Implemented	2	0	0	100	100

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Energy use includes energy losses from the generation of electricity.

Name of Group member or business unit or key activity or site: **Argyle Diamond Mine**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

1,634,300

GJ

Table 2.4 – Opportunities assessed to an accuracy of $\pm 30\%$ or worse						
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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	9	14,200	100	3,500	17,800
Business Response**	Under Investigation	1	1,900	0	0	1,900
	To be Implemented	0	0	0	0	0
	Implementation Commenced	2	4,300	0	0	4,300
	Implemented	0	0	0	0	0
	Not to be Implemented	6	8,000	100	3,500	11,600

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Energy use includes energy losses from the generation of electricity.

The evaluations for four of the *Not to be Implemented* opportunities were not completed because the opportunities fall outside the greater than the four year payback period, one opportunity because of safety concerns, and one opportunity due to technical concerns.

Name of Group member or business unit or key activity or site: **Energy Resources of Australia**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

1,359,000

GJ

Table 2.3 – Opportunities assessed to an accuracy of $\pm 30\%$ 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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	20	8,800	99,900	29,400	138,100
Business Response**	Under Investigation	5	5,400	94,900	800	101,100
	To be Implemented	0	0	0	0	0
	Implementation Commenced	5	3,400	1,000	16,200	20,600
	Implemented	6	0	4,000	5,900	9,900
	Not to be Implemented	4	0	0	6,500	6,500

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Energy use includes energy losses from the generation of electricity.

Name of Group member or business unit or key activity or site: **Energy Resources of Australia**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

1,359,000

GJ

Table 2.4 – Opportunities assessed to an accuracy of $\pm 30\%$ or worse						
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	12	0	1,900	96,000	97,900
Business Response**	Under Investigation	0	0	0	0	0
	To be Implemented	0	0	0	0	0
	Implementation Commenced	0	0	0	0	0
	Implemented	2	0	1,900	0	1,900
	Not to be Implemented	10	0	0	96,000	96,000

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Energy use includes energy losses from the generation of electricity.

The evaluations for the additional two *Not to be Implemented* opportunities were not completed due to one of the opportunities falling outside the greater than the four year payback period and the other being technically not feasible.

Name of Group member or business unit or key activity or site: **Northparkes Mines**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

901,600

GJ

Table 2.3 – Opportunities assessed to an accuracy of $\pm 30\%$ 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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	40	86,800	13,700	125,900	226,400
Business Response**	Under Investigation	0	0	0	0	0
	To be Implemented	10	5,200	1,500	200	7,000
	Implementation Commenced	0	0	0	0	0
	Implemented	16	67,100	12,200	49,200	128,500
	Not to be Implemented	14	14,500	0	76,500	91,000

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Table 2.4 is not applicable for Northparkes Mine. All opportunities have been evaluated to an accuracy of $\pm 30\%$ or better. Estimated energy savings have been revised following updated energy and cost information.

Name of Group member or business unit or key activity or site: **Rio Tinto Alcan**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

61,563,300

GJ

Table 2.3 – Opportunities assessed to an accuracy of $\pm 30\%$ 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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	111	477,000	181,900	77,100	735,900
Business Response**	Under Investigation	7	7,400	16,600	0	24,000
	To be Implemented	2	45,700	0	0	45,700
	Implementation Commenced	9	127,200	7,000	2,700	136,900
	Implemented	50	196,800	30,100	7,200	234,100
	Not to be Implemented	43	99,900	128,100	67,200	295,200

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Boyne Smelters Limited

Reported energy use excludes energy associated with the consumption of anodes which embody an additional 8,475,000GJ of energy. Some opportunities relate to the anode process and may have energy reduction and / or net carbon benefits.

Two opportunities that had commenced implementation in 2010 were *implemented* in Q1 2011 for two months. Previously reported energy savings were estimated on an annual basis, whereas the savings for these opportunities in this report have been pro-rated for the two months that the opportunities were *implemented* thereby reducing the reported energy savings.

Rio Tinto Alcan Bell Bay

Reported energy use excludes energy associated with the consumption of anodes which embody an additional 2,797,000GJ of energy. Some opportunities relate to the anode process and may have energy reduction and / or net carbon benefits.

The reduction in reported energy savings when compared to the 2010 EEO Public Report is due to: rationalisation of overlapping projects so as to remove the potential for double counting of projected savings; savings verification of implemented projects, and further refinements to project evaluations.



Rio Tinto Alcan Weipa

Energy use includes energy losses from the generation of electricity.

During the reporting period one opportunity was reclassified from *To be implemented* to *Not to be implemented* due to unforeseen technology availability issues making the opportunity not technically viable.

Name of Group member or business unit or key activity or site: **Rio Tinto Alcan**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

61,563,300

GJ

Table 2.4 – Opportunities assessed to an accuracy of $\pm 30\%$ or worse						
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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	40	1,196,600	2,800	1,100	1,200,500
Business Response**	Under Investigation	1	26,200	0	0	26,200
	To be Implemented	0	0	0	0	0
	Implementation Commenced	0	0	0	0	0
	Implemented	15	609,300	2,800	900	613,000
	Not to be Implemented	24	561,100	0	100	561,200

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Boyne Smelters Limited

Reported energy use excludes energy associated with the consumption of anodes which embody an additional 8,475,000GJ of energy. Some opportunities relate to the anode process and may have energy reduction and / or net carbon benefits.

The evaluation for the *Not to be Implemented* opportunity was not completed because of changed business conditions that resulted in the project not being viable.

Rio Tinto Alcan Bell Bay

Reported energy use excludes energy use associated with consumption of anodes which embody an additional 2,797,000GJ of energy. Some opportunities relate to the anode process and may have energy reduction and / or net carbon benefits.

Rio Tinto Alcan Weipa

Energy use includes energy losses from the generation of electricity.

The evaluations for the thirteen *Not to be Implemented* opportunities were not completed because all thirteen opportunities fall outside the greater than the four year payback period.

Rio Tinto Alcan Yarwun

The evaluations for the three *Not to be Implemented* opportunities were not completed because the opportunities were found to be technically not feasible.

Name of Group member or business unit or key activity or site: **Rio Tinto Coal Australia**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

13,483,400

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	49	317,600	19,400	30,200	367,200
Business Response**	Under Investigation	2	9,900	0	0	9,900
	To be Implemented	4	10,600	0	0	10,600
	Implementation Commenced	9	118,800	15,900	5,100	139,800
	Implemented	22	168,100	1,800	25,100	194,900
	Not to be Implemented	12	10,200	1,700	0	12,000

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Bengalla Mine

Two of the opportunities were reclassified from *To be implemented* to *Not to be implemented* as they are no longer technically viable due to changed business conditions.

Kestrel Mine

Table 2.4 is not applicable for Kestrel Mine. All opportunities have been evaluated to an accuracy of ±30% or better.

The evaluation for the *Not to be Implemented* opportunity was not completed because the opportunity falls outside the greater than the four year payback period.

Hunter Valley Operations

Table 2.4 is not applicable for Hunter Valley Operations. All opportunities have been evaluated to an accuracy of ±30% or better.

Following completion of the opportunity evaluation, which resulted in no energy savings, one opportunity was categorised as *Not to be Implemented* with no estimated energy savings reported.

Name of Group member or business unit or key activity or site: **Rio Tinto Coal Australia**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

13,483,400

GJ

Table 2.4 – Opportunities assessed to an accuracy of $\pm 30\%$ or worse						
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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	6	5,600	0	1,600	7,200
Business Response**	Under Investigation	1	1,800	0	0	1,800
	To be Implemented	0	0	0	0	0
	Implementation Commenced	0	0	0	0	0
	Implemented	4	800	0	1,600	2,400
	Not to be Implemented	1	3,000	0	0	3,000

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Bengalla Mine

The evaluation for the *Not to be Implemented* opportunity was not completed because it was not technically viable on account of changed business conditions.

Name of Group member or business unit or key activity or site: **Rio Tinto Iron Ore**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

31,814,600

GJ

Table 2.3 – Opportunities assessed to an accuracy of $\pm 30\%$ 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 – \leq 4 years	> 4 years	
Outcomes of assessment	Total Identified	54	218,600	53,200	9,700	281,500
Business Response**	Under Investigation	9	37,300	19,500	2,400	59,100
	To be Implemented	10	19,100	4,500	0	23,700
	Implementation Commenced	7	32,000	8,600	1,700	42,400
	Implemented	21	79,000	20,600	600	100,100
	Not to be Implemented	7	51,200	0	5,000	56,200

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Hope Downs Mine

The implemented opportunity's payback period was revised following updated cost savings information.

Paraburdoo Mine, Channar Mine & Eastern Ranges Mine

Table 2.4 is not applicable for Paraburdoo Mine, Channar Mine & Eastern Ranges Mine. All opportunities have been evaluated to an accuracy of $\pm 30\%$ or better.

Tom Price Mine

One project was reclassified from better than $\pm 30\%$ to worse than $\pm 30\%$ due to the identification of an additional cost, which is yet to be estimated to the required accuracy.

Name of Group member or business unit or key activity or site: **Rio Tinto Iron Ore**

Amount of energy assessed which generated the results below (and is reported in Table 1.2)

31,814,600

GJ

Table 2.4 – Opportunities assessed to an accuracy of ±30% or worse						
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	160	1,397,900	297,300	1,327,500	3,022,800
Business Response**	Under Investigation	108	981,900	280,000	26,600	1,288,500
	To be Implemented	6	26,600	2,000	0	28,600
	Implementation Commenced	11	83,100	12,200	0	95,300
	Implemented	2	0	3,200	0	3,200
	Not to be Implemented	33	306,300	0	1,300,900	1,607,200

* Any discrepancies are related to rounding errors to the nearest 100GJ.

** The number of opportunities in each row of the business response section total to the number of opportunities assessed to this level of accuracy in the 'Total Identified' row. This is the business response as at 1 July 2011.

Note:

Brockman No 2 / Nammuldi Mines

The evaluations for the four *Not to be Implemented* opportunities were not completed because three of the opportunities fall outside the greater than the four year payback period and the other opportunity was found to be technically not feasible.

Cape Lambert Port Operations

Cape Lambert Port Operations undertook its assessment in the second half of 2010. At 30 June 2011 costing of opportunities (±30% accuracy) had not been completed.

Table 2.3 is not applicable for Cape Lambert Port Operations. All opportunities are yet to be evaluated to ±30% accuracy.

The evaluation for the *Not to be Implemented* opportunity was not completed because the opportunity falls outside the greater than the four year payback period.

Dampier Port Operations

Dampier Port Operations undertook its assessment in the second half of 2010. At 30 June 2011 costing of opportunities (±30% accuracy) had not been completed.

Table 2.3 is not applicable for Dampier Port Operations. All opportunities are yet to be evaluated to ±30% accuracy.

The evaluations for the three *Not to be Implemented* opportunities were not completed because these opportunities fall outside the greater than the four year payback period.



Dampier Power Station, Paraburdoo Power Station, Cape Lambert Power Station

Table 2.3 is not applicable for Dampier Power Station, Paraburdoo Power Station, Cape Lambert Power Station. All opportunities are yet to be evaluated to $\pm 30\%$ accuracy.

Energy use includes energy losses from the generation of electricity.

Dampier Power Station, Paraburdoo Power Station, Cape Lambert Power Station undertook three assessments in a combined approach with one assessment report with each site developing its own opportunity list.

For the *implemented* opportunity, further evaluation of the cost and associated savings is being undertaken. Two of the three *implementation commenced* opportunities are at an operation that is scheduled for closure in Q1 2012 thereby limiting the practicality of continued access to the equipment for continued implementation of the opportunity and evaluation of its actual savings. Further evaluation for the third *implementation commenced* opportunity is required.

Four of the nine *not to be implemented* opportunities are at the operation that was closed in August 2010, two of the nine are at the operation that is scheduled for closure in Q1 2012, an additional two opportunities did not generate any energy efficiency benefits and the remaining one opportunity was technically not feasible.

Hope Downs Mine

The evaluations for the three *Not to be Implemented* opportunities were not completed because two of the opportunities fall outside the greater than the four year payback period and the other opportunity was found to be technically not feasible.

Marandoo Mine

The evaluations for the three *Not to be Implemented* opportunities were not completed because one of the opportunities falls outside the greater than the four year payback period and the other two opportunities were found to be technically not feasible.

Pilbara Iron Rail Operations

Pilbara Iron Rail Operations undertook its assessment in the second half of 2010. At 30 June 2011 costing of opportunities ($\pm 30\%$ accuracy) had not been completed.

Table 2.3 is not applicable for Pilbara Iron Rail Operations. All opportunities are yet to be evaluated to $\pm 30\%$ accuracy.

The evaluations for the seven *Not to be Implemented* opportunities were not completed because the opportunities fall outside the greater than the four year payback period. Following the initial EEO assessment workshops, further analysis was undertaken on these opportunities which demonstrated payback periods of greater than four years.

West Angelas Mine

West Angelas Mine undertook its assessment in the second half of 2010. At 30 June 2011 costing of opportunities ($\pm 30\%$ accuracy) had not been completed.

Table 2.3 is not applicable for West Angelas Mine. All opportunities are yet to be evaluated to $\pm 30\%$ accuracy.

The evaluations for the two *Not to be Implemented* opportunities were not completed because the opportunities fall outside the greater than the four year payback period.

Yandicoogina Mine

The evaluation for the *Not to be Implemented* opportunity was not completed because of changed business conditions which made it not technically viable.

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 significant opportunities at Argyle Diamond Mine

Reduce wear plate thickness in non wear zones (*Implementation Commenced*)

Dump truck trays are fitted with heavy duty wear plates to enhance tray longevity. Mine maintenance staff involved in the EEO assessment had observed uneven wear in tray liners. The trays have been redesigned using thinner plate in low wear sections. This has resulted in a weight reduction of approximately 10 tonnes/tray without impacting on tray longevity. The benefits of this project are reduced diesel usage, reduced maintenance costs and increased payload capacity. The new tray liners will be progressively installed as new tray liners are required on dump trucks. Action plans for project implementation are being developed.

Progress update: This project has two phases. Phase 1 has been implemented and Phase 2 is ongoing. Phase 1: a 1000kg weight reduction has been achieved on all trucks with the reduced height of the tray headboard. Phase 2: from January 2011, whenever the Cat 789 truck trays are to be refurbished, the thickness of dove tail liners will be reduced from 25mm to 20mm plate. This will result in a further 530kg weight reduction. Given that the ADM 789 haul truck trays weigh approximately 45 tonnes each, when fitted with the appropriate wear material, these EEO measures account for a 3.4% overall tray weight reduction. Approximately 80% of haul truck trays have been completed. 100% are scheduled to be completed by end of year. The actual costs and energy savings will be tracked through Jul – Dec 2011.

Generator efficiency (*Implemented*)

Electro Motive Diesel (EMD) generators, provide Argyle site with power. EMD generators indicate that the flue gas losses are significant. During the assessment, monitoring of the exhaust gas temperatures demonstrated that the exhaust gases of some generators were significantly hotter than manufacturer specifications. The generators will be progressively overhauled and tuned. Through improved combustion efficiency, diesel savings will be achieved and it is expected that there will be fewer breakdowns which will assist in controlling excess air and ultimately, will improve combustion efficiency. An action plan for project implementation is being developed.

Progress update: This opportunity has been implemented. The planned upgrade of four generators was completed in June 2010 and commissioned with all planned upgrades in operation. Improvements were realised by the replacement of existing parts with more efficient components. Test trial runs were completed in Aug 2010. The improvements have resulted in an overall reduction in specific fuel consumption from 277L/MWh to 272L/MWh. Fuel efficiency improvement achieved is 1.5% leading to annual savings of 102000 L diesel (3937 GJ per year).

Table 2.5 – Description of significant opportunities at Argyle Diamond Mine

Install VSD on one of the centrifugal compressors (*Under Investigation*)

The centrifugal compressor provides Argyle site with compressed air. A standard drive will be replaced by a variable speed drive sequencing will be installed on the programmable logic controller (PLC). Improved matching of the compressor speed to the load will lead to energy savings. An action plan is being developed for project implementation.

Progress update: This project is to be modified because, during 2010, the proposed installation of variable speed drives (VSD) on the compressors was found to be against the manufacturer's recommendations. The proposed modification is not technically feasible. Therefore, an alternative opportunity of upgrading the existing control panel on the units was submitted by the manufacturer for review. However, further investigations into this alternative opportunity have determined that it is also not technically feasible.

Jan – Jun 2011 No action completed. Compressors operate currently under standard loading and unloading cycles and the improvement by VSD will be insignificant and has been ruled out. Consultation with original equipment manufacturer is underway to understand further action.

Table 2.5 – Description of significant opportunities at Energy Resources of Australia

Compressed Air Optimisation (*Implementation Commenced*)

In 2009, an engineering audit was carried out across the mine to identify projects to improve compressed air quality, energy efficiency and reduce power and maintenance costs. In 2010, a series of projects, such as air leak maintenance will be implemented and the energy savings and other benefits will be quantified.

Progress Update: Air compressor system optimisation is still under implementation.

Replace Calciner Lining and Install Improved Burner System (*Implemented*)

Replacement of the Calciner refractory lining and the installation of an improved burner system have reduced Calciner energy usage. The replacements and commissioning were completed in September 2010. Preliminary data show an improvement of approximately 10% in Calciner efficiency with annualised savings of approximately 5,000 GJ and \$120,000 based on 2010 production.

Progress Update: Due to temporary suspension of processing activities and changes in operating parameters Calciner energy usage data collected in 2010 is considered to be the best available data. The project is complete and savings have been confirmed.

Replace site building air conditioners with new technology (*Implemented*)

Replacement of the Administration Building air conditioning system has commenced. The old unit was undersized relative to the cooling demand. The replacement system incorporates improved design features including relocation of the condenser coils external to the plant room and the installation of high efficiency split ducted units. Implementation commenced in 2010 and commissioning is planned to be completed by Q1 2011. The new installation is expected to reduce the Administration Building's air conditioning electricity consumption.

Progress Update: Replacement of the Administration Building air conditioning system has been completed. Energy savings are to be confirmed.

Table 2.5 – Description of significant opportunities at Northparkes Mines

E48 secondary crusher optimisation (*Implemented*)

Install and optimise a secondary surface crusher at underground operations which can crush ore to 80mm. The size reduction should enable less energy-intensive downstream processing.

Progress update: Commissioning of the secondary crusher was finalised in February 2011 but to date has had some technical issues which is reducing its availability and utilisation. There is currently an external project underway aimed at identifying strategies to fully utilise the secondary crusher, which will maximise its efficiency. Savings have been confirmed for this project.

E48 surface conveyor route optimisation (*Implemented*)

Optimise surface conveyor route from underground operations to the mill to decrease energy required for conveying ore.

Progress update: Commissioning of the overland conveyor was finalised in February 2011 with the commissioning of the E48 secondary crusher. This project has been implemented successfully with good utilisation to date. Savings have been confirmed for this project.

Open-cut/tailings dam material scheduling (*Implemented*)

Reducing double-handling of open-cut waste rock material for use in tailings storage facility construction.

Progress update: This project was completed during quarter four 2009. Savings confirmed on the best available data at the time.

Table 2.5 – Description of significant opportunities at Rio Tinto Alcan

Dust collection improvements – dust load control at Rio Tinto Alcan Yarwun (*Implementation Commenced*)

This project involves improving the fines collection and disposal system in the calciners to increase calciner efficiency. Fines loads incur an energy loss as they are circulating within the calciners. Improved control and management of fines loads should lower the energy intensity of this process.

Progress update: The results from the last trial were promising however other proven technology dust calciners are to be explored. The project is currently on hold due to priority on Yarwun 2 commissioning.

Optimisation of compressed air systems at Boyne Smelters Limited (*Implemented*)

Following the success of three previous compressed air efficiency projects, additional projects will be implemented. These improvements are: conduct an air leak reduction programme tiers one and two and implement control system improvements in the compressor house. These projects will also significantly improve the reliability of the compressed air system.

Progress Update: Compressed air projects for air leak reduction programmes and predictive maintenance philosophy for compressed air filters have been implemented in late 2009 and early 2010. The control systems improvement project has now been superseded by Line 1 and 2 compressor replacement project. The savings from the implemented projects have now been confirmed.

Table 2.5 – Description of significant opportunities at Rio Tinto Alcan

Optimisation of Metal Products gas usage at Rio Tinto Alcan Bell Bay (*Implemented*)

Heating demand for holding furnaces is variable. Furnaces are often pre-heated for extended periods of time in preparation for metal processing. When they rise above the desired holding temperatures they are opened in order to cool.

Progress update: Metal products gas usage has been optimised on the furnaces through a combination of scrap charge optimisation and the development of a programmable logic controller (PLC) for the scrap remelt function. The project has been implemented and savings validated.

Table 2.5 – Description of significant opportunities at Rio Tinto Coal Australia

Woodlands Dragline - increase dragline pre-strip to enable greater dragline utilisation in battleaxe zone at Mount Thorley Warkworth Operations (*Implementation Commenced*)

The opportunity to increase dragline pre-strip has commenced with the redevelopment of the dragline operating horizons strategy within a particular zone of the mine area. This new strategy aims to take advantage of dragline availability and provide additional dragline access to the mine area. Additional work on energy savings accuracy may be required as the specific nature of the work progresses. Realised energy savings will be calculated at the end of the project.

Progress update: This project is approximately 75% completed and will be completed during Q3 2011. Project scope includes

- Additional 500m (approx) of pit strike length created in West Pit.
- 18Mbcm (approx) of prime waste material required for removal to enable pit extension to be completed.

This material was all originally scheduled for removal via pre-strip means (truck and shovel). Of the 18Mbcm of prime waste to be removed for this extension, the target was for 40% of this to be moved by Dragline. It is now anticipated that the project is likely to move a total of 5 to 6Mbcm of prime waste with the Dragline fleet. Energy savings will be realised and clearly demonstrated, however only a portion (to be determined) of the energy savings originally forecast for the project will be delivered.

Replace existing diesel air compressors with two electric air compressors at Kestrel Mine (*Implemented*)

Progress update: Kestrel Mine has replaced three diesel run air compressors with two electric compressor units in order to achieve net energy savings and reduce operating and hire costs. The commissioning of these units was completed in 2010. Operating on a continuous basis to provide sufficient compressed air to support mining operations, the 160kW electric compressor units are estimated to achieve annual energy savings in the order of 29,000GJ.

Table 2.5 – Description of significant opportunities at Rio Tinto Coal Australia

Optimise truck tray size to match fleet at Hail Creek Mine (*Implemented*)

This project is aimed at increasing the tray size of the mine's fleet of 960 haul trucks to maximise their payload. By aligning tray volumes with capacity volumes, annual diesel savings of more than 450,000 litres may be possible. This opportunity requires the design, fabrication and installation of new truck trays.

This project commenced implementation in 2010, with older truck trays being progressively replaced with optimised trays. Confirmation of estimated energy savings is yet to be carried out.

Table 2.5 – Description of significant opportunities at Rio Tinto Iron Ore

Application of light weight haul truck trays at Tom Price Mine (*Implemented*)

The entire Tom Price haul truck fleet is expected to be converted to Light Weight Trays. The increase in tray capacity and reduced tray weight allows more waste to be moved each load. However, the fuel burn rate will increase slightly due to extra tonnage transported. The opposite will occur when hauling empty because the fuel burn rate will be reduced slightly due to the lighter trays. The net effect of the trays will have minimal impact on total fuel burnt; the impact will be seen in the fuel burnt/Total Material Moved (TMM) ratio, which will be reduced. The tray changeover provides for a seven per cent increase in TMM without a corresponding increase in diesel usage.

Progress update: All haul trucks have now had the lighter weight trays fitted. The benefit of the light weight trays will potentially yield a net benefit of ~10Mt of additional total material moved. Energy savings are currently being evaluated and results are expected by the end of the 2011 calendar year.

Truck Payload Program at Paraburdoo Mine, Channar & Eastern Ranges Mine (*Implemented*)

By optimising the amount of material that is transported by haul trucks, diesel consumption per equivalent flat haul can be reduced. In 2009, payload monitoring systems were installed on all haul trucks. The project was implemented in 2010. Trucks are now continuously reporting payloads through to Modular Mining and there are plans in place to ensure the system is maintained and accurate. Regular feedback is reported to production teams which include dig unit operators.

Along with a light weight tray replacement project, a significant increase in total material moved per truck haul has been allowed. Targets for waste have increased from 184 to 210 tonnes per truck run. Targets for ore have increased from 205 to 210 tonnes per truck run. In combination with operator education, this project has seen the average payload increase from 94% to 101% of the targets with 79% (up from 61%) of the loads within the target range. Some estimates show a saving of at least 10L for every kilotonne of material moved.



Table 2.5 – Description of significant opportunities at Rio Tinto Iron Ore

Lightweight dump bodies on haul trucks at Brockman No 2 / Nammuldi Mines (*Implementation Commenced*)

Haul trucks at site currently have standard trays installed. This opportunity involves the further investigation and justification of carrying a higher payload by replacing the heavier standard trays with lighter weight trays on all haul trucks. Tray replacement is expected to result in improved diesel efficiency through having an increased payload per truck for approximately the same fuel requirement ie less fuel used per tonne. Lightweight truck trays are on site. An implementation plan and schedule is still to be agreed.

Part 3 - Voluntary Contextual Information

Table 3.1 – Contextual Information

Rio Tinto has systematically identified and implemented energy efficiency improvement projects on an ongoing basis since 1996. Over 69 energy audits/reviews in Australian operations were conducted between 1996 and 2006 including as part of its global Excellence in Energy Management (EEM) programme and Rio Tinto was actively involved in the Commonwealth Government's Greenhouse Challenge Plus programme for over a decade.

Information on energy use by Rio Tinto globally is also included in Rio Tinto's Sustainable Development Review which is published annually (from 2008 this review has been incorporated in the Rio Tinto annual report). These reports can be found on the Rio Tinto website www.riotinto.com.

Rio Tinto's progress in implementing the EEO program at the end of the first EEO assessment cycle is summarised as follows:

- In total 512 opportunities have been reported by Rio Tinto Limited in the first assessment cycle with savings of 6,099TJ².
- 143 opportunities with estimated energy savings of 1,290TJ were *Implemented* by 30 June 2011 compared to 103 opportunities with estimated energy savings of 1,109TJ that had been implemented by the end of 2010.
- 79 opportunities with estimated energy savings of over 556TJ are categorised as *Implementation Commenced* or *To Be Implemented* by 30 June 2011 compared to 84 opportunities with estimated energy savings of over 913TJ at the end of 2010.
- For assessments that have been undertaken in the first EEO assessment cycle, 92 opportunities that were previously categorised as under investigation were evaluated and re-categorised *Implemented, Implementation Commenced, To Be Implemented* or *Not To Be Implemented*.
- As of 30 June 2011, 111 opportunities (1,318TJ savings potential) were awaiting: costing to $\pm 30\%$ accuracy; whole of business evaluation; or decision making. Rio Tinto Limited will continue to report the progress of these opportunities. The majority of these opportunities were identified during assessments carried out in 2010.

Rio Tinto's work under EEO is managed by a specific and documented compliance management system.

Figures 1 and 2 show the estimated energy savings and the number of opportunities respectively, by year and category, resulting from the completed assessments and the ensuing progress.

² In Figure 1, the decrease in estimated energy savings in 2011 is due to revised reported energy savings for an implemented opportunity at Boyne Smelters Limited.

Part 3 – Voluntary Contextual Information (continued)

Figure 1 – EEO summary: Estimated energy savings (TJ)

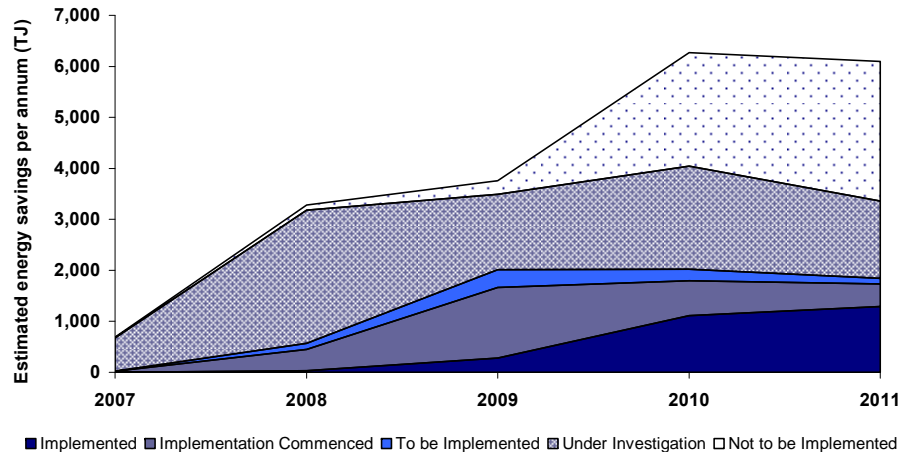
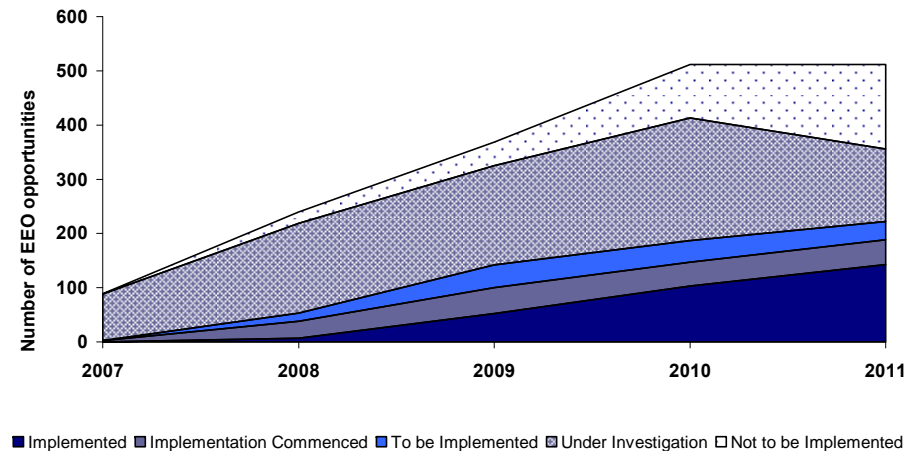


Figure 2 – EEO Summary: Number of opportunities



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*.

D A Peever

David Peever, Managing Director, Rio Tinto Australia.
Authorised representative of the Chief Executive Officer of Rio Tinto Limited

Date 2/11/2011