Centennial Coal

Charbon Colliery Continued Operations Environmental Assessment

Response to Submissions

February 2010

FUTURE POWER | Centennial Coal

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1 OVERVIEW

Centennial Coal Company Limited (Centennial) submitted an Environmental Assessment in support of an application for the continuation of operations at Charbon Colliery in October 2009. The Environmental Assessment was prepared in accordance with provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) and specifically with reference to the key assessment requirements incorporated within the Director General's Requirements issued by the Department of Planning (DOP) on 19 December 2008 (and as amended 6 February 2009).

The Environmental Assessment was publically exhibited by DOP from Friday 13 November 2009 to Friday 18 December 2009. Following the exhibition period, DOP requested (letter dated 23 December 2009) Centennial to respond to submissions received.

2 BACKGROUND TO CHARBON COLLIERY

The Charbon Colliery is owned by a joint venture between Centennial Coal Company Limited (95%) and SK Energy Australia Pty Ltd (5%), a wholly owned subsidiary of SK Corporation, Korea. The colliery is operated by Charbon Coal Pty Limited, the Proponent for the Project. Charbon Coal Pty Limited is a wholly owned subsidiary of Centennial Coal Company Limited and operates the Colliery under a management agreement for the joint venture parties.

The Charbon Colliery has been operating since the 1920s, initially supplying coal to the former Charbon Cement Works, located adjacent to the northern boundary of the Colliery. Following closure of the Charbon Cement Works in 1977, the Charbon Colliery was kept in production to meet regional demand for steaming coal. In 1985, the Colliery was upgraded, including the installation of the rail loop, coal handling preparation plant and an increase in the rate of production to allow the mine to produce a washed coal for export. In 1994, Centennial purchased the colliery from Blue Circle Southern Cement Ltd. Open cut mining commenced at the site in 1995.

The current approved Charbon Colliery consists of open cut and underground mining operations. The proposed Project would extend the life of the existing Charbon Colliery up to a maximum of 15 years. In the event that this proposed Project does not receive approval, the currently approved open cut and underground coal resources will be exhausted between 2010 and 2013 respectively.

3 SUMMARY OF THE PROPOSAL

The application for project approval relates to the following proposed activities:

- Mining of approximately 5.2 million tonne (Mt) of coal at a maximum rate of:
  - 700 000t per year using open cut mining methods in the Western and Southern Outlier, Southern Open Cut Extension and 8 Trunk, Central and Western Open Cuts; and
  - 900 000t per year using underground mining methods in the Western Underground; with the maximum quantity of coal mined annually not exceeding 1.5Mtpa
  - Over a maximum of 15 years.

- Transportation of ROM coal from the proposed mining areas to the existing approved CHPP using the existing underground coal transportation infrastructure and existing and upgraded internal haul roads.
- Processing of a maximum of 1.5Mt per year ROM coal at the existing CHPP.
- Transportation of a maximum of 250 000t of ROM and product coal per year to the Proponent's customers by public road.
- Transportation of a maximum of 20 000t product coal per year to the Charbon Lime Works by private road.
- Transportation of a maximum of 1.5Mt ROM and product coal per year to the Proponent's customers by rail.
- Placement of waste rock material within proposed in-pit waste rock emplacements.
- Expand and upgrade the existing reject emplacement area to allow for placement of Project-related fine and coarse reject material.
- Construction of associated infrastructure, including:
  - three new pollution control dams;
  - the Western Underground surface facilities area;
  - new and upgraded haul roads; and
  - the 2 Trunk ROM Coal Loading Facility.
- Progressive rehabilitation to create a final landform that would generally mimic the existing landform.
- Continued use of existing site infrastructure for the life of the Project.

4 SCOPE OF THIS DOCUMENT

This document responds to submissions to the Department of Planning in relation to the public exhibition of the Environmental Assessment between 13 November and 18 December 2009. This document builds on information presented in the Environmental Assessment and is to be read in conjunction with the Environmental Assessment.

This report has been compiled to:

- Provide a summary of approvals process timeline for the Project;
- Outline the consultation activities undertaken post submission of the Environmental Assessment in November 2009;
- Respond to submissions / common concerns received;
- Provide a summary of key Project amendments in response to the submissions received;
- Provide a revised Statement of Commitments (**Attachment 1**) that Centennial Coal agrees to undertake should the Project be approved by the Minister.

5 APPROVALS PROCESS

Table 1 presents the component stages of the overall approvals process for the Project under Part 3A of the EP&A Act.

Table 1 – Approvals Process for a Major Project and Centennial's Indicative Timeline

Stage	Activity	Indicative Timing
1. ⇨	Planning Focus Meeting held.	Completed – 16 August 2008
2.	Centennial writes to the Department of Planning lodging its Application.	Completed – 19 November 2008
3. ⇨	Project confirmed as a Major Project under Part 3A under EP&A Act by the Minister for Planning.	Completed – 19 December 2008
4.	The Department of Planning issues the Director-General's Requirements for the Project.	Completed – 19 December 2008
5. ⇨	Amended Director-General's Requirements issued.	Completed – 6 February 2009
6. ⇨	An Environmental Assessment is provided to the Department of Planning for consideration and assessment of adequacy by the Department and other government agencies (prior to it being placed on public exhibition).	Completed – 12 October 2009
7.	Environmental Assessment is accepted for adequacy with minor modifications requested.	Completed – 6 November 2009
8. ⇨	The Environmental Assessment is lodged with the Department of Planning.	Completed – 11 November 2009
9. ⇨	Public exhibition of the Environmental Assessment.	Completed - Friday 13 November 2009 to Friday 18 December 2009
10. ⇨	The Department of Planning seeks a response / clarification of issues raised in the submissions from government agencies and the community from Centennial.	Completed - 23 December 2009
11. ⇨	Centennial provides a response to the issues raised and a revised Statement of Commitments.	February 2010
12. ⇨	The Department of Planning prepares its assessment report based on all documentation submitted by Centennial, government agencies and the community (60 day assessment period).	February/March 2010

Stage	Activity	Indicative Timing
13	Project referred to the Planning Assessment Commission	TBC
14. ⇨	Project Approval sought by	April 2010

6 KEY PROJECT AMENDMENTS

The Project amendments provided in this document are:

- Additional commitment for a Blast Monitoring and Management Plan;
- Additional commitment for Air Quality Management Plan;
- Additional commitment to continue onsite meteorological monitoring;
- Additional commitment for an assessment of receiving drainage lines and creeks;
- Additional commitment for an assessment of onsite irrigation of effluent;
- Amend to the commitment for a Surface and Groundwater Management Plan to be prepared within 12 months of receipt of Project approval to coincide with timing of revised site water balance and salinity balance;
- Additional commitment for a Subsidence Monitoring Plan as a component of the Strata Control Management Plan;
- Amend the commitment to pay Section 94 contributions with a commitment to develop a Voluntary Planning Agreement with Council or revert to the Section 94 contributions process in 12 months of receipt of Project approval;
- Attach the Charbon Colliery Energy Savings Action Plan (**Attachment 2**).

7 PUBLIC SUBMISSIONS

7.1 Advertisement

The Department of Planning placed an advertisement in the Mudgee Guardian and the Sydney Morning Herald on 13 November 2009. The advertisement announced the public exhibition and provided details on the project. The advertisement also provided information on how to view a copy of the Environmental Assessment and how to make a submission.

7.2 Public Exhibition Locations

The Environmental Assessment for the project was made publicly available from Friday 13 November until Friday 18 December 2009 at the following locations:

- Department of Planning: Information Centre, 23 – 33 Bridge Street, Sydney;
- Mid-Western Regional Council: 77 Louee Street, Rylstone; and 86 Market Street, Mudgee;
- Nature Conservation Council: Level 2, 301 Kent Street, Sydney;
- Department of Planning's website at http://www.planning.nsw.gov.au; and
- Centennial Coal's website http://www.centennialcoal.com.au

7.3 Submissions Summary

Thirty-nine submissions were received by the Department of Planning following public exhibition of the Environmental Assessment. Submissions were lodged by individuals, community organisations, and State Government departments (NSW Office of Water, Department of Industry and Investment, and Department of Environment Climate Change and Water). One Local Government submission received by Centennial has also been included. Seven of the public submissions supported the proposed Project being approved.

Table 2 illustrates the number of submissions received by category of submitter.

Table 2 Category of Submitters

Category of Submitter	Number of Submissions Received
Individual	34
Community Organisation	2
State Government Department	3
Local Council	1
Total	40

Comments from submissions were grouped by topic requiring response. In summary, the key concerns raised in submissions in response to the Environmental Assessment were:

Government Agencies

- Ecology (impacts on native vegetation and threatened species/communities, avoidance of areas of high conservation, rehabilitation requirements, no biodiversity offsets described);
- Noise (application of Industrial Noise Policy, accuracy of baseline meteorological data);
- Blasting (blasting monitoring, management plan, structural testing);
- Air quality (air quality management plan, meteorological monitoring, real time dust monitoring is required);
- Surface water (site water balance, downstream impacts, irrigation of effluent, adequate water supply for all stages of the project, water quality monitoring);
- Groundwater (water licencing, Project site located within Murray Darling Basin embargo area);
- Aboriginal heritage (requirement for a cultural heritage management plan);
- Subsidence (impacts of first workings, monitoring);
- Traffic (impacts to council infrastructure); and
- Greenhouse gas (requirements for NGERS assessment, accuracy of the estimated emissions from onsite diesel fuel consumption, energy efficiency measures has not been provided).

Public Submissions

- Ecology (impacts on native vegetation and threatened species/communities, impacts to threatened species including EPBC listed species);
- Noise (changes to noise amenity unacceptable, application of Industrial Noise Policy, accuracy of baseline meteorological data);

- Blasting (impacts to near by residences);
- Air quality (impacts to near by residences, accuracy of baseline meteorological data);
- Surface water impacts (offsite water impacts, water usage, impacts the a nearby residence water easement);
- Groundwater impacts (impacts to near by residences as groundwater users, previous groundwater studies, downstream impacts, Project site located within Murray Darling Basin embargo area);
- Traffic (increase in traffic from road transport of coal on Castlereagh Highway);
- Greenhouse gas (increasing global climate change, lack of Scope 3 emissions assessment);
- Visual amenity (from open cut mining);
- Waste material (impacts from in pit placement);
- Impacts of mining at Ilford, Mt Vincent, Cherry Tree Hill and Running Stream;
- Project timing (increased from 6 years to 15 years); and
- Support for the Project.

Section 10 provides Centennial's response to the issues raised by topic from the submissions received.

8 SUPPORT FOR THE PROJECT

Seven public submissions of support were received for the Project outlining support for the continuation of jobs within a small community and the ongoing contributions to local schools, community events and voluntary organisations. It is noted that of the 29 public submissions that opposed the Project, only 14 were from the local area.

The 2006 Census data indicated that 71 people, or 14% of all employed persons within the Clandulla, Charbon and Kandos area, are employed within the mining industry, indicating that mining is a significant contributor to the economy of the local area.

The Project would result in a range of socio-economic benefits to the community within the vicinity of the Project Site if it continues beyond the current anticipated closure date for the Colliery of April 2013. These benefits would include the following:

- Continued direct employment for approximately 143 personnel.
- Continued supply coal to the Kandos Cement Plant and Charbon Lime Works, providing additional security of employment for the approximately 100 and 24 employees of those businesses.
- Injection of approximately $26.2 million per year into the local and regional economy, with an additional approximately $32 million per year into the State and national economy for the life of the Project. This expenditure is likely to generate additional economic activity and flow on effects, providing further employment opportunities.
- Provision of competitively priced, high quality coal for domestic and international customers to provide for the energy requirements of the people of NSW and elsewhere.
- Provision of additional export income for Australia, with the benefits associated with improved terms of trade.

As a result, the socio-economic benefits of the Project are overwhelmingly positive.

9 COMMUNITY CONSULTATION POST SUBMISSION

The Environmental Assessment was submitted to DOP on 11 November 2009, and was publically exhibited from Friday 13 November 2009 to Friday 18 December 2009. Section 4 (Vol 1) of the exhibited Environmental Assessment detailed the community consultation undertaken in accordance with the DOP Director General's Requirements for the Environmental Assessment up until the above mentioned submission date.

Below is a summary of the consultation that has continued post submission of the Environmental Assessment.

9.1 Local Council

Centennial gave a presentation to the Mid Western Regional Councillors on 17 November 2009. The presentation provided an overview of the Project. The presentation detailed that the predicted impacts from the Project to Council infrastructure and facilities would be an equivalent scale to the current operation.

Centennial has subsequently received correspondence from the Council requesting Charbon to enter into a voluntary planning agreement (Section 93F, EP&A Act) with Council.

Centennial has since commenced discussions with representatives of Council to negotiate a voluntary planning agreement in lieu of EP&A Act Section 94 or 94A contributions. An initial meeting was held at Council on 21 January 2010 with another meeting set for 8 February 2010 at Charbon Colliery.

Centennial will continue over the next 12 months, with good faith negotiations, to enter into a Voluntary Planning Agreement. If however, an appropriate agreement cannot be reached, Centennial will instead meet relevant requirements of the Mid Western Regional Council Section 94 Development Contributions Plan 2005-2021.

9.2 Charbon Community Consultative Committee

Charbon Community Consultative Committee (CCC) was established in 2004. Charbon Colliery CCC meeting minutes are available publically online at Centennial Coal's website- http://www.centennialcoal.com.au

Charbon Colliery CCC functions under the guidance of the Department of Planning Guidelines for Community Consultative Committees. The Guidelines for CCC's describes the purpose of the forum to:

- establish good working relationships between the company, the community and other stakeholders in relation to the mine;
- provide for the ongoing communication of information on mining operations and the environmental performance of the mine, including:
  - on Project assessment including scoping of issues for assessment and comment
  - on the implementation of conditions of approval, the mining operations plan and any other management plans.
- provide an opportunity to comment on the mine's environmental performance;
- discuss community concerns and review the resolution of community complaints;
- discuss how best to communicate relevant information on the mine and its environmental performance to the broader community; and

- work together towards outcomes of benefit to the mine, immediate neighbours and the local and regional community.

Charbon Colliery presented information and consulted the CCC on the Environmental Assessment at CCC meetings in April and October 2009.

When the exhibition period of the Environmental Assessment commenced on 13 November 2009, copies were distributed to the members of the CCC.

Charbon CCC held an extra-ordinary meeting on 17 December 2009 during the exhibition period of the Environmental Assessment. A presentation was given on the key outcomes of the Project. The Charbon Colliery Mine Manager and Environment and Community Coordinator were present to answer questions raised by the members of the CCC.

9.3 Community Forum and Resident Register

As described in Section 4.2.2 of the Environmental Assessment, a community forum was held in Kandos Community Hall on 28 January 2008. Attendees were provided the opportunity to request to be notified when the Environmental Assessment went on exhibition or to request to be sent a CD copy of the Environmental Assessment. As a result of requests registered, 47 attendees were notified via letter that the Environmental Assessment had been placed on exhibition and three attendees received an Environmental Assessment CD.

Also during targeted consultation with 33 local residents surrounding the Project Site (Section 4.2.4), residents were also provided the same opportunity as the attendees of the community forum. As a result of requests registered, one resident was notified of the exhibition and 18 local residents received an Environmental Assessment. Note that some of the local residents were also registrants from the community forum.

9.4 NSW Department of Environment, Climate Change and Water (DECCW)

Consultation has been undertaken with DECCW on its submission on the ecology assessment. A meeting was held with Centennial and DECCW (1 February 2010) to clarify issues raised by DECCW and to commence preliminary discussions on a biodiversity strategy to mitigate the unavoidable ecological impacts associated with the Project. Information on locality of flora quadrats requested by DECCW in its submission was provided at this meeting. DECCW will review the information and another meeting is planned in the near future to continue discussions.

Centennial reconfirmed to DECCW, Centennial's commitment to develop and implement an appropriate Biodiversity Land Management Strategy within 12 months of receiving Project approval. The Strategy would be prepared in consultation with the consent authority and other relevant Government agencies (including DECCW).

Centennial also provided information to DECCW on outcomes of the draft bio-banking study that was completed in 2009 and why the application of bio-banking is not suitable for the locality of the Project.

9.5 Federal Department of Environment, Water, Heritage and the Arts (DEWHA)

Centennial received a letter from DEHWA (22 December 2009), reminding Centennial of its obligations under the Environment and Protection Biodiversity Conservation Act 1999, that a person proposing an action that is likely to have a significant impact on a matter of national environmental significance must refer their proposal to DEWHA for assessment and approval.

Centennial has since contacted DEWHA (11 January 2010) and confirmed that a draft referral has been prepared for the Project and that it will be submitted to DEWHA in February 2010.

9.6 Charbon Colliery Workforce

Consultation was undertaken with Charbon workforce through information presented in site bi-monthly site newsletters. This commenced in the August 2008 newsletter and every newsletter subsequent to December 2009.

The Mine Manager addressed the workforce in face to face meetings over shift change to inform them about the Project Application in January 2009, and again in December 2009 during the Environmental Assessment exhibition period.

10 RESPONSE TO SUBMISSIONS

ISSUE	RESPONSE
ECOLOGY (FLORA AND FAUNA)	
Biodiversity impacts on native vegetation and threatened species/communities	Charbon has stated a commitment to prepare a Biodiversity Land Management Strategy within 12 months of gaining approval to mitigate the unavoidable biodiversity impacts of clearing of native vegetation. Section 5.5.8 of the Environmental Assessment outlined the possible options that could comprise the Biodiversity Land Management Strategy. As discussed earlier in this document, Charbon has met with DECCW to commence discussions on biodiversity impacts with further meetings planned. Charbon also will be submitting an EPBC referral in February 2010 which may have potential to alter the mix of possible options that will make up the Biodiversity Land Management Strategy. Charbon proposes to consider the consultation outcomes with DECCW and DEWHA in the preparation of the strategy.
There has been no referral to Federal Government for EPBC listed species	An EPBC referral is being prepared and will be submitted in February 2010 for assessment by DEWHA.
Inadequate avoidance of high conservation value areas	The Project proposes to mine the majority of the remaining unapproved coal reserves located within existing mining and exploration leases held by Charbon Colliery. There is limited opportunity to avoid areas within the proposed mining footprint without reducing the amount of coal to be mined. Charbon proposes to mitigate the impacts to high conservation value areas through its commitment to prepare a Biodiversity Land Management Strategy.
Rehabilitation requirements	Charbon has stated a commitment to prepare a Rehabilitation and Vegetation Management Plan prior to the commencement of land preparation operations.

ISSUE	RESPONSE
No biodiversity offsets described	Section 5.3.8.3 Ecology Assessment (Part 2, Vol 1) outlines that a Biodiversity Land Management Strategy would be developed within 12 months of gaining approval and that the strategy would be designed in accordance with the principles established in the *Principles for the use of Biodiversity Offsets in NSW*.
NOISE	
Accuracy of baseline meteorological data	At the time of preparing the Noise Impact Assessment the only onsite weather data available was for the period 1 January 2005 to 14 November 2008. Of this data, the annual data sets for 2005 to 2007 each contained an unacceptable proportion of missing data of between 9 months and 10 months each, presumably due to a faulty data acquisition system. The 2008 data was the most complete annual weather data set with 10.5 months of data. Also, the onsite weather station was upgraded from 1 hour interval recordings to 15 minute intervals from 1 January 2008. Since preparing the Noise Impact Assessment, the 2009 onsite weather data set has been made available. Consequently, the 2008-2009 weather data sets (i.e. two years of data) have been analysed with the result that no substantial differences in the prevailing wind directions have been found. In the Noise Impact Assessment, the wind data was analysed in order to determine the frequency of occurrence of winds considered relevant for assessing the potential noise impacts, in accordance with the DECCWs Industrial Noise Policy (INP), for each of the four seasons and for each assessment period (day, evening and night). The assessment found that ESE wind conditions of between 0.5 m/s and 3 m/s (light winds) are a significant feature of the Project Area only during the Autumn evening period and Summer and Autumn night-time periods, in accordance with the DECCWs INP, where a light wind is considered to be a significant feature of the area if it is occurs for a significant period of time (i.e. greater than 30% of any one assessment period during any one season).
Application of Industrial Noise Policy	The Noise Impact Assessment was prepared strictly in accordance with the procedures specified in the DECCWs INP. Accordingly, the licence and consent noise limits should be determined with reference to the

ISSUE	RESPONSE
	predicted noise emission levels presented in the Noise Impact Assessment together with the corresponding atmospheric conditions under which the noise limits apply. In accordance with the INP, Chapter 9 Consent/Licence Conditions, which states - the agreed (noise) limits in the Consent or Licence apply under the meteorological conditions determined by the policy to be relevant to the assessment site - we believe that the recommended noise limits apply under all meteorological conditions except under any one of the following: ▪ Relevant wind speeds greater than 3 m/s at 10 metres above ground level; or ▪ All other wind speeds greater than 0.5 m/s at 10 metres above ground level; or ▪ Stability category F temperature inversion conditions and wind speeds greater than 0.5 m/s at 10 metres above ground level; or ▪ Stability category G temperature inversion conditions. Where a 'relevant' wind is any wind which is determined to be a feature of the area in accordance with Section 5.3 of the INP.
Changes to noise amenity not acceptable	The Noise Impact Assessment was prepared strictly in accordance with the procedures specified in the DECCWs INP, which has included an assessment of amenity. Charbon believes that on balance, the Project provides benefits that outweigh the impacts.
BLASTING	
Impacts to near by residences - blast monitoring plan required	The ground vibration and airblast levels which cause concern or discomfort to residents are significantly lower than structural damage (even cosmetic damage) limits. Consequently, if the ANZEC blast emissions (ground vibration and airblast) limits normally adopted by the DECCW (ground vibration - 5 mm/s with an allowable 5% exceedance to a maximum of 10 mm/s; and airblast - 115 dBLinear with an allowable 5% exceedance to a maximum of 120 dBLinear) are included in the consent conditions then the residences and structures adjacent to the Charbon Colliery blasting will be adequately protected.

ISSUE	RESPONSE
	During a Heggies Acoustic site visit of 8 May 2008, Heggies monitored a blast at Residence R7, who was one of the main complainants in relation to structural damage to his residence from blasting at the Colliery. During the visit, ground vibration, structural vibration and airblast was measured at Residence R7. The measured levels of vibration were 1.2 mm/s in the ground and 1.4 mm/s on the residence. The level of airblast was 104 dBLinear. The blast had an MIC of 355 kg and was located 1,920 m from the residence. These levels are clearly well below even the DECCWs "general" human comfort blast emission criteria. Reference to the Environmental Assessment indicates that the predicted levels of ground vibration and airblast from blasting in the Colliery at the nearpoint to Residence R7 (Residence F in the Environmental Assessment) using an MIC of 480 kg are 2.8 mm/s and 107.4 dBLinear respectively (for a 5% likelihood of exceedance). These blast emission levels are well below the recommended structural damage criteria (refer to the blasting section in the Environmental Assessment). Notwithstanding, Charbon has made a revised commitment to prepare and implement a Blast Monitoring and Management Plan.
Impacts to near by residences - consideration should be given for structural integrity testing	Charbon commits to completing and implementing a Blast Monitoring and Management Plan that includes contingency plans to address any community concerns about blasting impacts to residences.
Commitment of one blast per day is required	Blasting will be managed with compliance to ANZECs recommended ground vibration and airblast criteria. Charbon has added a commitment to prepare a Blast Monitoring and Management Plan that will incorporate the ANZEC criteria.
AIR	
Air quality management plan is required	Charbon has made a revised commitment to include completing and implementing an Air Quality Management Plan which identifies dust management practices that effectively minimise dust emissions including when water is not available for dust suppression.
Commit to undertake meteorological monitoring.	A meteorological station has been established at the Project Site since 2005. Charbon has made a revised commitment to commit to the continuation of collecting meteorological data.

ISSUE	RESPONSE
Commitment requested to ensure compliance at Residence G	The Air Quality Assessment predicted PM10 exceedances at Residence G during the mining of the Western Outlier. Charbon has committed to negotiating an appropriate arrangement with the owner of Residence G prior to any mining of the Western Outlier to ensure that there is no potential for adverse health-related impacts associated with dust emissions.
Real time dust monitoring must be included in the air quality monitoring protocol	The Air Quality Assessment outlined the existing and proposed monitoring locations including that TSP and PM_{10} monitoring will be conducted at Resident T. It is considered that installing both real time monitoring and undertaking sampling using a high volume air sampler is unnecessary and excessive. The use of high volume air samplers alone will provide adequate information to understand the impact of the mine upon the air quality surrounding the project site. It is therefore proposed that high volume air sampling be the adopted method to assess PM_{10} and TSP concentrations and that real time monitoring is not required.
Accuracy of baseline meteorological data including Nullo Mountain and Bathurst data	An extract from Section 5 of the Air Quality Assessment (Part 1, Vol 1) is provided below to out line the selection of baseline data. "While the BoM Nullo Mountain AWS is situated at an altitude of approximately 1 130m AHD, significantly different to that of the Project Site, it is the closest BoM operated station to the Project Site and has been considered the most appropriate resource for use in analysing historical regional meteorological and climatological conditions due to the long term nature of data available at the site (records commenced in 1988). It is stressed that the use of historic Nullo Mountain data to illustrate the profile of the regional climate has no bearing on the dispersion modelling process and has been provided simply to assist in illustrating the validity of the CALMET dataset". Section 4.2 of the Air Quality Assessment provides a very detailed explanation for the selection of the Bathurst dataset. The following (as detailed in Section 4.2 of the Air Quality Assessment) briefly summaries this: After reviewing the above information, the Bathurst 2006 daily-varying PM_{10} dataset is considered appropriate for use in the conservative assessment of existing PM_{10} concentrations at the Project Site for the following reasons: ▪ The 2006 Bathurst dataset provides a continuous monitoring dataset for use in the assessment for the same

ISSUE	RESPONSE
	time period as the meteorological input data, as per the requirements of the NSW DECC Approved Methods. ▪ The 2006 Bathurst dataset is viewed as being reflective of higher than average ambient particulate levels that could be experienced at the Project Site, due to wide-spread drought and bushfire conditions across southeast Australia. Therefore, the dataset is viewed as a conservative representation of potential ambient PM_{10} concentrations for the air shed surrounding the Project Site. ▪ Based on the distribution of the dataset, the use of the 75^{th} percentile 24-hour PM_{10} concentration in the analysis of the predicted incremental PM_{10} concentrations, in addition to the daily varying background dataset, will be useful in providing an indication of cumulative impacts at surrounding receptors. ▪ Based on the very short term comparison between available PM_{10} concentrations recorded at the Project Site and corresponding concentrations at Bathurst, the Bathurst dataset is typically higher than the concentrations recorded at the Project Site. This conclusion, while not definitive due to the lack of available data, further supports the adoption of the 2006 Bathurst PM_{10} dataset for use in conservatively accounting for existing background PM_{10} concentrations.
SURFACE WATER	
Site water balance	Charbon has made an existing commitment to rerun the site water balance and prepare salinity balance within 12 months of gaining approval after further water quality and quantity data is available.
Salinity balance	See above comment.
Downstream impacts to creeklines	The DGRs did not require Charbon to complete an assessment of receiving drainage lines and creeks. Notwithstanding, Charbon has made a revised commitment to undertake assessment of receiving drainage lines and creeks.

ISSUE	RESPONSE
Irrigation of effluent requires assessment	The existing Charbon Environmental Protection Licence allows the discharge of treated waste water for spray irrigation (LDP1). Charbon DGRs did not require any assessment of receiving drainage lines and creeks. The Project does not propose to change the volume discharged through LDP1. Notwithstanding, Charbon has made a revised commitment to undertake assessment of onsite irrigation of effluent.
Adequate water supply for all stages of the project needs to be identified	Charbon has made an existing commitment to rerun the site water balance within 12 months of gaining approval after further water quality and quantity data is available. The existing commitment of preparing a Surface and Groundwater Management Plan will take into account results of the revised water balance, salinity balance, geomorphological investigations, effluent irrigation, past and future monitoring data. The plan will also take into consideration aspects of licencing, site water transfer and storage of water. Accordingly, the timing of the preparation of the Surface and Groundwater Management Plan has been changed to coincide with the results of the revised site water balance and salinity balance.
Water quality monitoring	The Environmental Assessment in Section 5.8.6 and Section 5.9.6 has committed to continuing and extending the existing surface and groundwater monitoring program.
Impacts to a titled water easement	A titled water easement is held by a neighbouring landowner that traverses Charbon owned land to the north of the proposed Southern and Western Outliers. The Project does not propose any activities within the easement and therefore will not infringe upon the rights pertained to that landowner by virtue of their easement.
GROUNDWATER	
Water licencing requires updating	The Environmental Assessment has stated that there are required changes to existing water licencing at Charbon. It was also recognised that restrictions regarding required water allocation exists at the site due the Murray Darling Basin embargo. Centennial commenced consultation with the NSW Office of Water in February 2009 regarding the licencing and water allocations requirements and consultation is still ongoing.

ISSUE	RESPONSE
	The existing commitment of preparing a Surface and Groundwater Management Plan will take into account aspects of licencing, storage of water and any continuing consultation with NSW Office of Water.
Project site located within Murray Darling Basin embargo area	See above comment.
Mining of the Western Underground will cause seepage from local residence dams	No dams directly over lie the Western Underground workings and therefore no dams will be subsided and therefore will not have any affects from mine subsidence.
B1 and B4 cannot be authorised under the same licence as PB2 and PB3.	Bores B1 and B4 are licensed as bores with a “Mining” Purpose under 80BL244068, and are currently used as only monitoring bores. They are not used as production bores as they did not provide sufficient flow following exploration drilling and flow testing. They are licensed under a separate license to the Production Bores PB2 (80BL244069) and PB3 (80BL244070).
Groundwater study did not include water bore on neighbouring property	Bore GW800780 (which has licence number 80BL236246) was included in the Groundwater Assessment and is not anticipated to be adversely affected by mining as the 25m bore in sandstone (0-4mbgl) and shale (4-25mbgl) is stratigraphically beneath the proposed mining horizon and will therefore not be depressurised during mining.
No previous groundwater studies have been completed in 50 years	There has been one previous study on the Groundwater in 2008 (CM Jewell & Associates) as well as the Groundwater Assessment completed as part of the Environmental Assessment. Charbon has committed to preparing groundwater management plan as part of the Surface and Groundwater Management Plan which will include a groundwater monitoring program.
Impacts to downstream users within Hawkesbury River system	There will be no far reaching impact on aquifers in the Hawkesbury Nepean system as the only workings in that catchment are in the southern most open cuts, and those open cuts will not intersect, or have an effect on, the regional water table (Vol 2, Part 7, Section 2.7.3).

ISSUE	RESPONSE
ABORGINAL HERITAGE	
Requirement for a cultural heritage management plan	Charbon has made a commitment to prepare an Indigenous Heritage Management Plan in consultation with the registered Indigenous groups and individuals. Charbon notes DECCW comments on the suggested content of the Plan.
SUBSIDENCE	
Impacts of first workings	Charbon has committed to a "first workings" mining method for the Western Underground. The Subsidence Assessment (Part 10, Vol 2) concluded that associated surface subsidence would be less than 20mm. This degree of surface subsidence will not be resolvable from background movements and survey error using terrestrial survey techniques.
Subsidence monitoring requested	Charbon has made a revised commitment to complete a Subsidence Monitoring Plan as a component of the Strata Control Management Plan in consultation with DII.
TRAFFIC	
Impacts to council infrastructure	As discussed in the above consultation section, since the submission of the Environmental Assessment, Charbon has received correspondence from Mid Western Regional Council requesting Charbon to enter a Voluntary Planning Agreement (Section 93F, EP&A Act). Centennial will continue over the next 12 months, with good faith negotiations, to enter into a Voluntary Planning Agreement. If however, an appropriate agreement cannot be reached, Centennial will instead meet relevant requirements of the Mid Western Regional Council Section 94 Development Contributions Plan 2005-2021.
Increase in traffic from road transport of coal on Castlereagh Highway	Charbon currently has development consent approval for unlimited haulage on local and regional roads. The Project proposes to cap the number of tonnes transported annually to 250,000t. The Traffic Assessment (Vol 2, Part 8) concluded that the traffic implications of road haulage of coal from Charbon to Kandos and Mt Piper would not impact of the safety or performance of the roads and intersections of

ISSUE	RESPONSE
	the study area. Section 3.3 of the Traffic Assessment states that the transportation of coal to Mt Piper would principally be transported via the Castlereagh Highway only when an issue at another coal mine prevents them from fulfilling their contractual obligations to Mt Piper.
GREENHOUSE GAS	
Unable to assess if the measurements would meet the requirements for NGERS method 4	Centennial has submitted to the Federal Department of Climate Change, a complying National Greenhouse and Energy Reporting (NGER) Report for 2008-2009. This report has been independently verified to the requirements of the Measurement Determination 2008 by auditors Ernst and Young. Centennial's greenhouse and energy emissions will be made publicly available by the Greenhouse and Energy Data Office in accordance with the requirements of the *National Greenhouse and Energy Reporting Act 2007 (*NGER Act) by 28 February 2010. The NGER Act, its supporting regulations and the *National Greenhouse and Energy (Measurement) Determination 2008* (Measurement Determination 2008) superseded programs in place prior to 1 July 2008. This included the Greenhouse Challenge Plus program to which Centennial has been a signatory since 1995. For the purposes of this Environmental Assessment, Charbon utilised the most up to date data set available, the 2007-2008 period. In 2007-2008, Centennial undertook voluntary reporting of emissions through the Greenhouse Challenge Plus program. These emissions were estimated using the Australian Greenhouse Office "Factors and Methods Workbook". The estimation measures undertaken had been independently audited to the AGO standard in 2006. Scope 1 emissions arising from fugitive gases (CO_2, CH_4) for 2007-08 were estimated using data (collected in accordance with industry standard practice complying with the applicable State or Territory legislation, in this case the *Coal Mines Health and Safety Act 2002*). The data collected was recorded in Ventilation Officers monthly report and the mines monthly Greenhouse and Energy report and applied the estimation methods provided in the AGO "Factors and Methods workbook". Following the introduction of the NGER Act, in 2008-2009 emissions were estimated using NGERS method 4 for

ISSUE	RESPONSE
	the underground operation and method 1 for the open cut as specified in the NGERS Measurement Determination 2008. In meeting the NGERS requirements for 2008-09 it has been found that a previously undetected small quantity of CO_2 (0.33%) is present in the ventilation flow. This has been addressed in the 2008-09 NGERS report.
Unable to verify the accuracy of the estimated emissions from onsite diesel fuel consumption	Scope 1 emissions from diesel use for 2007-08 have been estimated from fuel usage data and the application of the AGO "factors and Methods workbook". This did not require to monitoring and reporting of contractor diesel usage. For the 2008-09 reporting period under the NGER Act and using the NGERS Measurement Determination 2008 open cut diesel used was 2,795,530 litres and production 657,604 $TCO_{2\text{-}e}$ giving 4.87 l/t ROM. This data has been independently verified to the requirements of the Measurement Determination 2008 by auditors Ernst and Young.
A detailed assessment of proposed energy efficiency measures has not been provided	The mine has completed an Energy Saving Action Plan in accordance with the Guidelines issued by the NSW Minister for Climate Change and Environment resulting in the following energy saving opportunities: ▪ Power factor correction (waiting quotations) ▪ Shutdown supplementary fan at weekends (done) ▪ Compressed air system leaks (done) ▪ Dam solar pump (done) ▪ Shutdown Black Tanks pump (done) ▪ CITECT System (improve process control)(underway) ▪ Install sub metering (underway) ▪ Reduce idle time (prestart) of O/C machines (done) ▪ Turn belts off on night shifts (done).

ISSUE	RESPONSE
	Further investigations are to be carried out for the following additional opportunities: ▪ Total lighting audit ▪ Provision of facilities at Southern Open Cut to reduce truck movements from Southern Open Cut to 3rd entry ▪ Use lower emission and/or ethanol/biodiesel blends in open cut machines ▪ Evaluate transformer spare capacity at 4 Trunk to provide power to open cut workshop and offices Monday to Friday (while underground power on) ▪ Change consent conditions to allow increased loading at 810 (reduce trucking to 3rd entry) ▪ Carbon capture and rehabilitation soil research ▪ Mine water supply high pressure pumps operating on demand. The Energy Savings Actions Plan is appended as **Attachment B**.
Increasing global climate change	As outlined in Section 3 of the Greenhouse Gas Assessment (Part 4, Vol 2), Charbon has committed to reducing greenhouse gas emissions from the site. Charbon proposes to achieve this reduction through commitments made in an Energy Savings Actions Plan (DECCW) and the Energy Efficiencies Opportunity Program (Federal Department of Resources Energy and Tourism).
Lack of Scope 3 emissions assessment	In accordance with the DOP DGRs, Scope 3 emissions have been calculated in Section 2.5.2 of the Greenhouse Gas Assessment.
VISUAL AMENITY	
Visual impacts to local area open cut mining	Section 5.12.2 of the Environmental Assessment provides a summary of the visual impacts from the Project. It is noted that the closest, publicly accessible views of the proposed operations would be likely to be obtained from Mount View Road. Daytime views of the proposed operations would be limited views as shown in Figure 5.33 in the Environmental Assessment displaying the sight distances to the existing open cut mine from Mount View Road. Charbon has made a commitment to complete the proposed visual amenity plantings in the vicinity of

ISSUE	RESPONSE
	Mount View Road which will further reduce the visibility of operations from surrounding residential receiver locations. Charbon has also committed to preparing a Rehabilitation and Vegetation Management Plan. The plan will comprise information on the proposed vegetation replanting and timing of rehabilitation for the open cut areas.
WASTE MATERIAL	
Chemical impacts from in pit placement	The proposed mine plan has been designed to minimise the disturbance footprint of the mining area by having in-pit emplacement. Within the Project Site, the coal seams predominantly outcrop at the base of hills (Drawing 5, Groundwater Assessment, Part 7, Vol 2). The seams within the proposed open cut and underground workings are of limited areal extent and are likely to have limited, intermittent, rainfall recharge. A previous groundwater study noted that the open cuts were dry and had no observable groundwater flow or seepage. The groundwater assessment concluded that the regional groundwater level is beneath the proposed open cut (and underground workings). As a result, the regional aquifer system would not be intercepted, or adversely affected, by the proposed open cut and underground workings. Charbon has made an existing commitment to prepare a Rehabilitation and Vegetation Plan. This plan will take into account chemical characteristics of overburden material.
OTHER	
Oppose mining at Ilford, Mt Vincent, Cherry Tree Hill and Running Stream	Noted. The proposed Project is not within the localities of Ilford, Mt Vincent, Cherry Tree Hill or Running Stream.
Project impacts on the groundwater resource of Mt Vincent	See above comment. Mt Vincent and its surrounds are outside the potential underground subsidence effects or the potential open cut mining effects on the groundwater system and was therefore not considered in the assessment.

ISSUE	RESPONSE
Project timing (increased from 6 years to 15 years)	At the community meeting held in Kandos in January 2009, the life of the project was referenced as six years. This is correct based on the current production rates and remaining approved and unapproved coal reserves. The life of the project has been extended within the Environmental Assessment to allow for changes in production rates (decrease) and ongoing rehabilitation requirements if required.
Support for the proposed project	Noted.

ATTACHMENT 1 – STATEMENT OF COMMITMENTS

Continued Operations of Charbon Colliery February 2010

Desired Outcome	Action	Timing
1. General		
All operations are undertaken in a manner that will minimise the environmental impacts associated with the Project.	1.1 Operate generally in accordance with the Environmental Assessment and conditions of approvals, licences or consents.	Continuous.
	1.2 Develop management plans to manage and mitigation impacts of the Project.	
2. Hours of Operation		
All operations are undertaken within the approved operating hours.	2.1 Land Preparation – Daylight hours, Monday to Saturday.	On campaign basis.
	2.2 Underground Mining – 24 hours, 7 days per week.	Continuous.
	2.3 Open Cut Mining – Monday to Friday 7.00am to 10.00pm, Saturday 7.00am to 6.00pm.	Continuous – winter, spring, summer.
	2.4 Open Cut Mining – Monday to Saturday 7.00am to 6.00pm.	Continuous – autumn.
	2.5 ROM Coal Loading Operations – 24 hours, 7 days per week.	Continuous.
	2.6 Blasting Operations – 9.00am to 5.00pm, Monday to Saturday.	Continuous.
	2.7 Maintenance Operations – 24 hours, 7 days per week.	Continuous.
	2.8 CHPP – 24 hours, 7 days per week.	Continuous.
	2.9 Product Coal Loading Despatch (rail) – 24 hours, 7 days per week.	Continuous.
	2.10 Product Coal Loading and Dispatch (road) – 6.00am to 10.00pm, 7 days per week.	Continuous.
	2.11 Rehabilitation – Daylight hours, Monday to Saturday.	On campaign basis.

Desired Outcome	Action	Timing
3. Noise Management		
Project-related noise impacts on surrounding residences minimised.	3.1 Prepare and implement a **Noise Monitoring and Management Plan**, including a noise monitoring protocol.	Within 6 months of receipt of Project approval.
	3.2 Prepare an updated noise model.	Within 12 months of receipt of Project approval.
	3.3 Limit the hours of open cut mining operations to 7:00am to 10:00pm to avoid noise impacts on surrounding residents during the night and thereby minimise sleep disturbance and intrusion during the quietest part of the day.	Continuous.
	3.4 Limit the hours of open cut mining operations during autumn to 7:00am to 6:00pm unless a real time noise monitoring program is developed as part of the Noise Monitoring and Management Plan.	Continuous.
4. Ecology Management		
Minimise Project-related impacts on flora and fauna within and surrounding the Project Site.	4.1 Prepare a **Fauna Handling and Management Plan** identifying procedures for inspection of vegetation prior to removal and management of any fauna identified during the inspection or clearing operations.	Prior to commencement of land preparation operations.
Implementation of an appropriate ecology monitoring program to monitor undisturbed sections of the Project Site and areas undergoing rehabilitation.	4.2 Modify and implement the existing **Ecology Monitoring Program** within the Compensatory Habitat Area to include other areas that would not be disturbed within the Project Site as well as areas of progressive rehabilitation.	Within 6 months of receipt of Project approval
	4.3 Prepare a detailed **Rehabilitation and Vegetation Management Plan**, including a detailed description of rehabilitation procedures to be implemented and tree, shrub and grass species to be used during rehabilitation.	Prior to the commencement of land preparation operations.
	4.4 Develop and implement an appropriate **Biodiversity Land Management Strategy** in consultation with the consent authority and other relevant Government agencies.	Within 12 months of receipt of Project approval.

Desired Outcome	Action	Timing
5. Air Quality Management		
Site activities are undertaken, as far as practicable, without exceeding DECCW air quality criteria or goals.	5.1 Complete and implement an **Air Quality Management Plan** which identifies dust management practices that effectively minimise dust emissions including when water is not available for dust suppression.	Within 6 months of receipt of Project approval.
	5.2 Prepare and implement an **Air Quality Monitoring Protocol,** including continued monitoring of deposited dust, PM_{10} and TSP.	Within 6 months of receipt of Project approval.
	5.3 Prepare an updated air quality model.	Within 12 months of receipt of Project approval.
	5.4 Continue onsite existing meteorological monitoring.	Continuous.
Appropriate arrangement with impacted residents negotiated.	5.5 Negotiate an appropriate arrangement with the owner of Residence G to ensure that there is no potential for adverse health-related impacts associated with dust emissions.	Prior to commencing mining operations within the Western Outlier.
6. Greenhouse Gas Management		
Appropriately manage and minimise greenhouse gas emissions.	6.1 Prepare an **Energy Savings Action Plan** in accordance with the requirements of the DECCW.	Within 6 months of receipt of Project approval.
7. Indigenous Heritage Management		
Identified and unidentified Aboriginal sites are appropriately managed.	7.1 Prepare an **Indigenous Heritage Management Plan** in consultation with the registered Indigenous groups and individuals, including a procedure for managing identified sites of heritage significance or sensitivity and for limiting the potential for damage to unidentified sites.	Prior to commencing land preparation operations in the vicinity of identified sites of Indigenous heritage significance.

Desired Outcome	Action	Timing
	7.2 Complete further investigations in the vicinity of possible scar tree CH-ST5 and SAL 4.	Prior to commencing land preparation operations in the vicinity of CH-ST5 and SAL 4.
8. Blasting Management		
Project-related blasting impacts within relevant Guidelines.	8.1 Undertake blasting within the Southern Open Cut Extension only.	Continuous during blasting operations.
	8.2 Do not initiate blasting outside the hours of 9:00am and 5:00pm, Monday to Saturday, except for safety or emergency reasons.	Continuous during blasting operations.
	8.3 Prepare a **Blast Management and Monitoring Plan** that includes contingencies to address any community concerns about blasting impacts to residences.	Within 6 months of receipt of Project approval.
9. Surface Water and Groundwater		
All surface water and groundwater managed such that water-related impacts are minimised to the greatest extent practicable.	9.1 Prepare a **Sediment and Erosion Control Plan**.	Prior to land preparation operations in each area of proposed disturbance.
	9.2 Prepare updated site water balance.	Within 12 months of receipt of Project approval.
	9.3 Prepare a salinity balance.	
	9.4 Prepare a **Surface and Groundwater Water Management Plan** which will include detailed water monitoring and response protocols in consultation with the NSW Office of Water.	Within 12 months of receipt of Project approval.
	9.5 Complete an assessment of downstream impacts to drainage lines and creeks.	Within 6 months of the receipt of Project approval.
	9.6 Complete an assessment of onsite irrigation of effluent.	Within 6 months of the receipt of Project approval.

Desired Outcome	Action	Timing
10. Traffic and Transportation Management		
Project-related impacts on transportation and the road network surrounding the Project Site are limited.	10.1 Prepare a **Transportation Management Plan** including a Driver's Code of Conduct and fatigue management procedures.	Within 6 months of the receipt of Project approval.
	10.2 Ensure that all heavy vehicles transporting coal from the Project Site via public roads do so between the hours of 7:00am and 10:00pm.	Continuous.
	10.3 Develop a Voluntary Planning Agreement with Council in lieu of existing and future Section 94 contributions or revert to the Section 94 contributions process.	Within 12 months of the receipt of Project approval.
11. Subsidence Management		
No significant surface subsidence associated with the Western Underground.	11.1 Undertake first workings only.	Continuous during mining of the Western Underground.
	11.2 Restrict subsidence levels to < 20mm of subsidence.	Continuous during mining of the Western Underground.
	11.3 Prepare a Western Underground **Subsidence Monitoring Plan** as part of the Strata Control Management Plan in consultation with DII.	Prior to mining of the Western Underground.
12. Visual Amenity Management		
Day-time visibility of site activities limited.	12.1 Complete the proposed visual amenity plantings in the vicinity of Mount View Road.	As soon as practicable.
	12.2 Ensure that the western section of Hill B, located to the west of the Western Outlier, remains undisturbed.	During mining operations within the Western Outlier.
	12.3 Ensure, where practicable, that mining and waste rock placement operations are undertaken behind a 4m and 5m high barrier respectively, particularly during the evening, to limit visual impacts associated with moving mining equipment and lights.	Continuous during mining operations.

Desired Outcome	Action	Timing
	12.4 Ensure that all open cut mining-related lights are extinguished at the completion of each day's mining operations, with the exception of those required for activities that may be undertaken between 10:00pm and 7:00am or those that are required for safety or security-related purposes.	Continuous during evening mining operations.
13. Soil Management		
The Proponent's activities do not result in soil degradation or loss.	13.1 Prepare and implement a **Soil Management Plan**. This plan may be prepared as a component of the **Surface and Groundwater Management Plan**, or the **Sediment and Erosion Control Plan** or the **Rehabilitation and Vegetation Management Plan.**	Within 6 months of the receipt of Project approval.
14. Environmental Monitoring		
Implementation of an appropriate water monitoring program to ensure continuing compliance with relevant water quality criteria.	14.1 Expand the licensed discharge point water quality monitoring program to include the monitoring locations identified in Section 5.8.6	During discharge events.
	14.2 Monitor all accessible registered bores in the vicinity of the Project Site, subject to landholder approval, for standing water level, pH and electrical conductivity.	Monthly.
	14.3 Monitor all accessible registered bores in the vicinity of the Project Site, subject to landholder approval, for laboratory-based water quality analysis.	Annual.
	14.4 Monitor the volume and quality of water used or transferred around the Project Site.	Continuous.

ATTACHMENT 2 – CHARBON COLLIERY ENERGY SAVINGS ACTION PLAN

Energy Savings Action Plan

Centennial Charbon P/ L

ACN: 064 237 118

CENTENNIAL

CHARBON COLLIERY

OCTOBER 2009

'I certify that this Savings Action Plan has been prepared in accordance with the Guidelines issued by the NSW Minister for Climate Change and Environment. I am authorised to submit this Plan, on behalf of the designated user, to Department of Environment and Climate Change (DECC)'.

Grant Watson, Mine Manager, 30 October 2009

CHARBON COAL

Contents

CHARBON COAL

1. INTRODUCTION

Centennial Coal values its role in sustainable development and understands that the community is an important stakeholder in our business. Directors and Management recognise that Centennial Coal's environmental responsibilities go beyond those required under statutory regulations and encompass its social obligations to achieve sustainable development and minimise environmental impacts associated with each operation.

At Charbon documentation of electricity supply infrastructure at both the distribution and connected equipment levels is generally maintained, with trending of equipment and other production related performance parameters is not readily available via although some measures of instantaneous energy consumption exists.

1.1 Objective

Energy savings are seen as an important component of Centennial's commitment to sustainable development. To this end, Centennial Coal has developed an Energy Action Saving Plan (ESAP) in accordance with DECC guidelines at Charbon.

Conducted during February – April, 2009, these plans were expected to identify significant opportunities to reduce electricity consumption to:

- Improve the efficiency of the operation,
- Reduce costs and
- Reduce environmental impact.

1.2 Key Performance Indicator

Previously, the mine's Key Performance Indicator (KPI) has reflected Greenhouse emissions per run of mine tonne. As a requirement of the Energy Savings Action Plan a new KPI has been established. This (KPI) measures and records energy use per tonne of coal produced and the unit is gigajoules per run of mine tonne (GJ/ROM tonnes). This KPI for the 2007-2008 is 0.128(GJ/ROM tonnes). This is referenced in Appendix 1 – Annual Report on Energy Use.

1.3 Background

Charbon Coal is located in the western coalfields south of the townships of Kandos and Charbon. The Colliery is approximately 230 kilometres north-west of Sydney.

The mine is owned 95% by the Centennial Coal Company Ltd and 5% by SK Australia, a subsidiary of a South Korean company. Underground mining commenced in the 1920's with production increasing from 180,000 to 600,000 tonnes in 1985 after an upgrade and the addition of rail loading facilities. The open cut operation was commences in 1996 adding a further 600,000 tonne to the mine output per year.

Charbon Colliery currently employs both underground continuous mining systems and in the open cut uses drill and blast methods to produce in the order of 1.3 Million tonnes of run of mine (ROM) coal annually.

There are currently 103 people employed in the underground operations and an additional 40 full time contractors employed in the open cut operation. Local contractors are also used for regular maintenance and project work.

The underground operation, works the Lithgow seam 3 of 8.5 hour shifts Monday to Friday using continuous miner methods.

There are 2 production panels the first a super panel (development) comprising 2 of 12cm 12 continuous miners, 3 shuttle cars & a ratio feeder with the second panel (extraction) having 1 of 12CM 12 continuous miners, 2 shuttle cars a ratio feeder and 3 Breaker Line Supports.

Production is carried out on 2 shifts each day with the super panel operating on day shift only and the extraction unit producing on both day and afternoon shifts. The super panel and associated equipment is maintained on afternoon shifts with maintenance on night shift for the extraction panel and conveyors.

Open Cut had 3 units operating during 2007-2008 (loader & 3 trucks per unit) utilising and combination drill and blasting and the use of dozers to rip and push the overburden which is loaded into dump trucks using front end loaders. Production occurs over a regime of 5 dayshifts (7.00am to 4.30pm with afternoon shift maintenance and coal loading from ROM stockpile onto belt system with some Saturday production work (about one in two using dozers only.

The Open Cut mines 2 seams Irondale (upper seam, high ash, less than 50% recovery) and the Lithgow Seam (main seam export quality).

Internal coal handling and transport occurs via a conveyor system from the underground and open cut workings to the Pit Top area, located approximately 6 kilometres north of the current workings to the onsite coal handling facility comprising run of mine product bin, 150,000 tonne stockpile, sizers, truck loading for local customers, washery, final products stockpile and rail loading capability enabling around 80% of coal product to be exported to customers in Japan, Korea, Taiwan, New Caledonia and New Zealand with the remaining product is sold to local customers Cement Australia and Unimin.

Other surface facilities include administration building, workshops main ventilation fans, trunk conveyor, compressors, located adjacent the underground mine entry with offices, workshops, compressor and coal handling for the open cut located at 8 trunk entry about 3 klm south.

2. BASELINE INFORMATION

2.1 Business Activity Indicator (BAI)

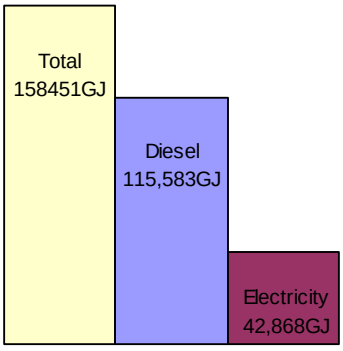
Run of Mine (ROM) tonnes of coal has been selected as the Business Activity Indicator (BAI) with coal produced at Charbon Colliery dispatched to customers both domestic and overseas after a range of coal preparation to meet the specific contract requirements.

Coal produced at the mine during the selected baseline year 2007-2008 financial year was 1,237,754 ROM tonnes giving a KPI of 0.128GJ/ROMTonne.

The total energy used at the mine for the report year was 158,451GJ, comprising of

- Diesel fuel (2987.1kl) being 115583GJ (73%) approximating 8,671TCO_2 e and
- Electricity (11,908MWH) being 42,868GJ (27%) approximating 12,646TCO_2 e

Figure 1: Energy Consumption by type 2007-2008



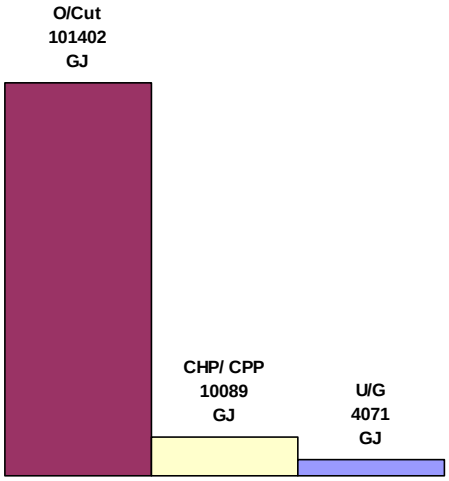
2.2 Energy Usage

2.2.1 Diesel Fuel

The energy consumed by diesel fuel is 115,583GJ and is equivalent to 73% of all energy used at the mine. The main areas of diesel fuel consumption are:

1. Open cut operations: - use diesel for fuel for 3 of 992 loaders, 9 of775D trucks, a 50T excavator, 2 of D11 and 1 of D10 dozer, a water truck, personnel transports and generators as well as for blasting of overburden. This area used 2,626,990 litres being equivalent to 101,402GJ of energy.
2. Underground operations: - diesel fuel is used for men and materials transport and mining support. The mine diesel fleet comprises 3 Load Haul Dump vehicles, 3 Multi-purpose Vehicles, 4 personnel transports, a bobcat and a grader that used 105,463 litres equalling 4,071GJ.
3. Coal Handling and Coal Preparation Plants: - Diesel fuel is used in this area by a Komatsu 375 Dozer, a Komatsu WA500 Loader and truck to maintain coal stockpiles and reclamation for preparation and reject disposal using 261,927 litres of fuel or 10089GJ.

Figure 2: Diesel Energy Consumption by area 2007-2008



2.2.2 Electricity

Mine electricity in 2007 – 2008 was supplied via 2 separate supply points:

1. NMI NEEE000978: Charbon Road, Charbon, 98.57% of total electricity use.
2. NMI NEEE002166: Cooper Drive, Charbon, 1.43% of total electricity use.

The electrical energy consumed is 11.9GWh and is equivalent to 27.1% of all energy used (figure 1 above) the main areas of electricity consumption are:

1. Two ventilation fans that are required to be operated 24 hours 365 days per year and equates to about 0.816GWh or 2936GJ which is 6.85%of total electrical energy used at the mine
2. Compressed air to provide air power for air diaphragm pumps, Stone dusters and other equipment requiring compressed air from main compressors at the mine surface that use 2.4GWh or 8637GJ which is 20.15%of total electrical energy used at the mine
3. Coal production equipment, continuous miners, shuttle cars and breaker feeders account for .2.43GWh or 8749GJ which is 20.41%of total electrical energy used at the mine.
4. Underground conveyors system comprising 14 conveyors and feeders make up for 2.18GWh or 7844GJ which is18.3%of total electrical energy used at the mine.

5. Surface coal handling and preparation operates 24 hours per day 5 days per week as well as 2 of 12hour and 1 of 11hour shift on the weekends with an average output of 220tonnes per hour resulting in the use of 2.32GWh or 8,343GJ which is 19.46% of total electrical energy used.
6. Other surface infrastructure including bathhouse, mine offices and workshops use 0.98GWh or 3528GJ which is 8.23%of total electrical energy used at the mine.
7. Pumping uses 0.78GWh or 2830GJ which is 6.6%of total electrical energy used at the mine.

3. SITE ENERGY BALANCE

Charbon Colliery comprises surface facilities underground and open cut working with energy use in the form of electricity and diesel fuel distributed across the mining operation as described below. This information has been determined using records of diesel fuel purchased and issued for use, also individual electricity metering on site, together with information from electrical reticulation drawings.

3.1 Electricity Usage – Supply Distribution

For the financial year 2006-2007 monthly electricity usage for each supply point is shown in the following Tables 1, 2 and 3, it should be noted that supply point, NMI NEEE000978 was the main supply for mining operations and that supply point NMI NEEE002166 provides power to a small pumping system.

Table 1: Monthly Electricity Consumption for NMI NEEE000978

Charbon Coal NEEE000978 Month Beginning	kVA DEM	KWH	AV P.F.	P.F @MAX kVA
01-Jul-07	3,731.23	1,141,429	0.7643	0.7717
01-Aug-07	3,881.48	1,137,697	0.7508	0.7652
01-Sep-07	3,627.23	1,046,339	0.7780	0.7470
01-Oct-07	3,656.69	740,159	0.7460	0.7402
01-Nov-07	3,651.47	971,010	0.7427	0.7605
01-Dec-07	3,566.24	764,058	0.7538	0.7477
01-Jan-08	3,756.08	753,762	0.7555	0.7564
01-Feb-08	3,633.21	1,081,258	0.7514	0.7544
01-Mar-08	3,548.80	984,821	0.7527	0.7463
01-Apr-08	3,609.46	1,024,273	0.7687	0.7499
01-May-08	3,538.03	1,102,370	0.7727	0.7599
01-Jun-08	3,729.69	989,748	0.7622	0.7603
YTD TOTAL	**43,929.61**	**11,736,924**		
AVERAGE	3,660.80	978,077	0.7582	0.7550

Table 2: Monthly Electricity Consumption for NMI NEEE002166

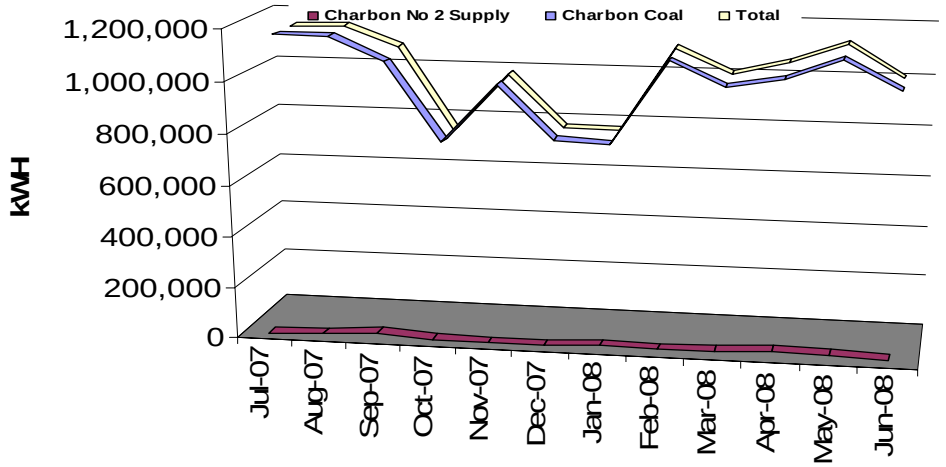
Charbon Coal 2 NEEE002166 Month Beginning	kVA DEM	KWH	AV P.F.	P.F @MAX kVA
01-Jul-07	89.04	1,810	0.7897	0.7683
01-Aug-07	102.15	11,840	0.7643	0.7666
01-Sep-07	102.33	25,751	0.7465	0.7595
01-Oct-07	16.00	7,133		
01-Nov-07	26.86	6,897	0.7290	0.7393
01-Dec-07	14.17	6,799	0.7191	0.7566
01-Jan-08	100.53	17,433	0.7583	0.7635
01-Feb-08	100.74	13,111	0.7460	0.7637
01-Mar-08	101.00	16,268	0.7430	0.7640
01-Apr-08	104.30	27,096	0.7605	0.7749
01-May-08	102.28	24,463	0.7271	0.7632
01-Jun-08	81.84	12,026	0.7427	0.7213
YTD TOTAL	**941.24**	**170,627**	**8.2262**	**8.3409**
AVERAGE	78.44	14,219	0.7478	0.7583

Table 3: Monthly Electricity Consumption for NMI NCCCREA01 and NMI 4103477122

Charbon Coal Month Beginning	NEEE000978 KWH	NEEE002166 KWH	Total KWH
01-Jul-07	1,141,429	1,810	1143239
01-Aug-07	1,137,697	11,840	1149537
01-Sep-07	1,046,339	25,751	1072090
01-Oct-07	740,159	7,133	747292
01-Nov-07	971,010	6,897	977907
01-Dec-07	764,058	6,799	770857
01-Jan-08	753,762	17,433	771195
01-Feb-08	1,081,258	13,111	1094369
01-Mar-08	984,821	16,268	1001089
01-Apr-08	1,024,273	27,096	1051369
01-May-08	1,102,370	24,463	1126833
01-Jun-08	989,748	12,026	1001774
YTD TOTAL	**11,736,924**	**170,627**	**11907551**
AVERAGE	978,077	14,219	992296

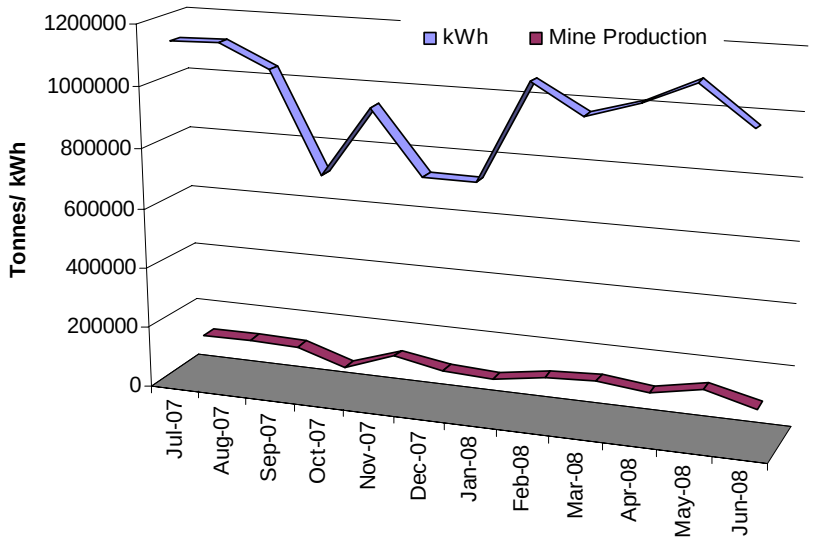
The monthly electricity usage for each supply point and total is illustrated in figure 3 below.

Figure 3: Monthly Electricity Consumption for Each Supply Point and in Aggregate



Electricity usage is reflected in the operating pattern of the mine see figure 4 with the period of October 2007 and between December 2007 – January 2008 coinciding with reduced production from both underground and open cut areas.

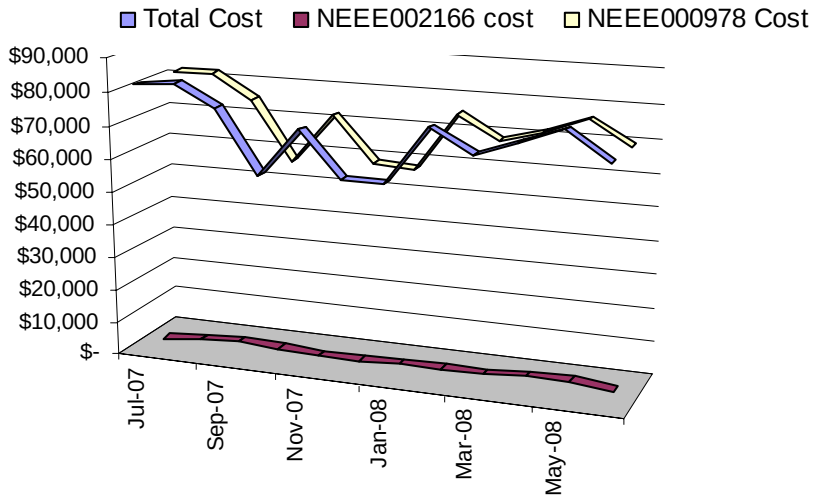
Figure 4: Monthly Electricity Consumption V Production



3.2 Electricity Energy Cost

Electricity use at Charbon Colliery cost more than $856,900 in 2007-2008.The monthly cost of electricity for the main metered supplies and in aggregate is shown below in figure 5 and table 6

Figure 5: Monthly Electricity Cost for Each Supply Point and in Aggregate



The price paid for electricity at supply points NMI NEEE000978 and NMI NEEE002166 is based on the mine having a long term contract with Country Energy that was negotiated on a company wide basis to find the most competitive supplier.

Table 4: Monthly Electricity Unit Cost for Each Supply Point and in Aggregate

Month Beginning	NEEE000978 $ (ex GST)	NEEE002166 $ (ex GST)	Total $ (ex GST)
01-Jul-07	$ 81,571.27	$ 486.45	82,058
01-Aug-07	$ 81,663.84	$ 1,406.62	83,070
01-Sep-07	$ 74,515.14	$ 2,247.62	76,763
01-Oct-07	$ 56,685.97	$ 1,510.70	58,197
01-Nov-07	$ 71,569.46	$ 842.38	72,412
01-Dec-07	$ 57,938.45	$ 803.68	58,742
01-Jan-08	$ 57,469.20	$ 1,517.51	58,987
01-Feb-08	$ 74,394.58	$ 1,425.46	75,820
01-Mar-08	$ 67,627.44	$ 1,456.66	69,084
01-Apr-08	$ 71,208.80	$ 2,410.91	73,620
01-May-08	$ 75,763.46	$ 2,335.64	78,099
01-Jun-08	$ 68,789.51	$ 1,292.68	70,082
Totals	**$ 839,197.12**	**$ 17,736.32**	**$ 856,933.44**
Average	$ 69,933.09	$ 1,478.03	$ 71,411.12

Charbon average electrical energy cost was around $0.70 per ROM tonne for the 2007 - 2008 year figure 6 below shows the monthly electrical energy cost per tonne trend, Figure 7 (below) depicts the actual cost of electricity and production per month.

Figure 6: Monthly Electricity Cost per ROM Tonne

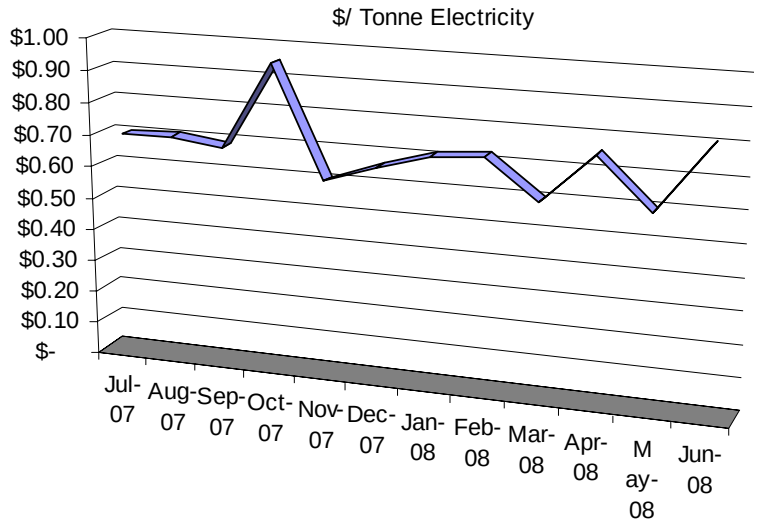
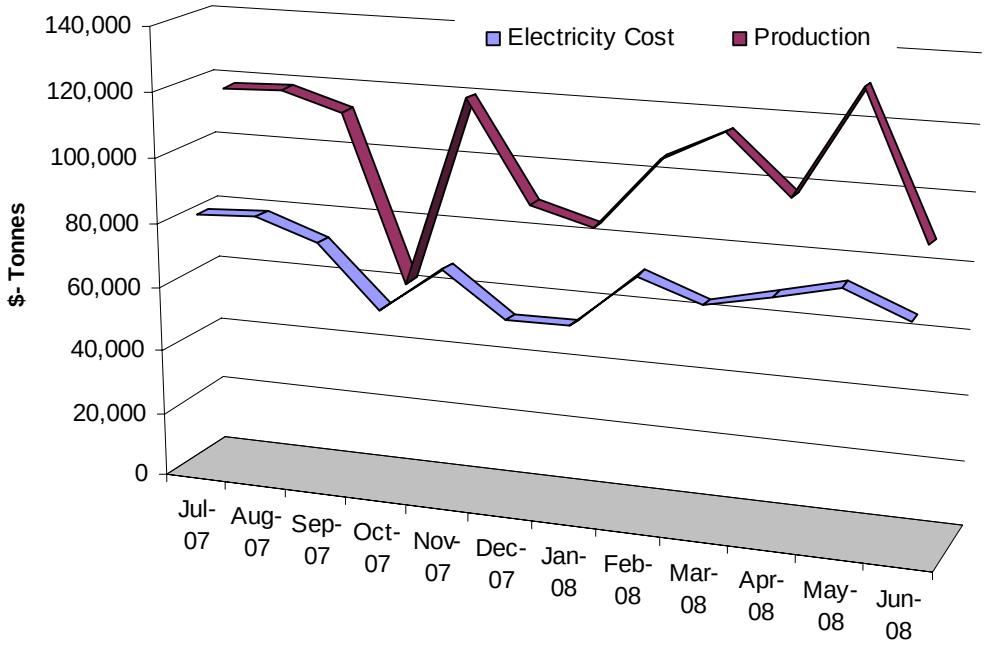


Figure 7: Monthly Electricity Cost and Production

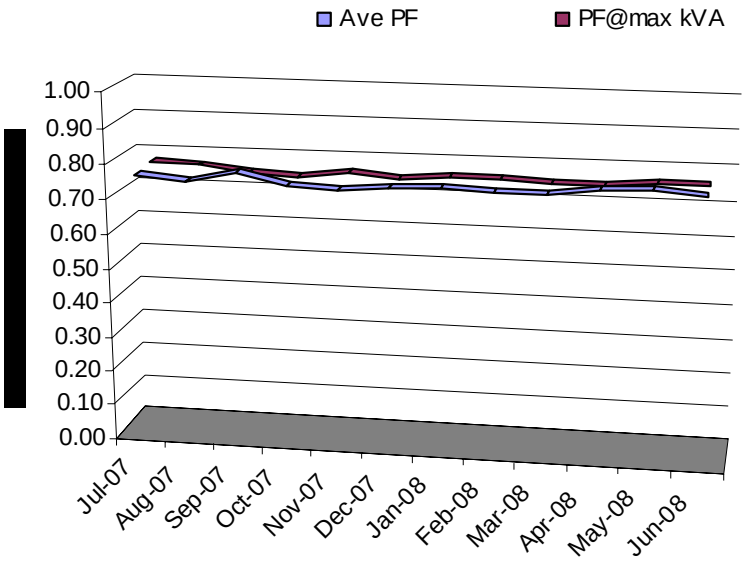


3.3 Power Factor

Charbon Colliery electricity cost for the financial year 2007 – 2008 was inflated due to the mine having a poor power factor averaging 0.75 resulting high maximum demand charges.

Improving the mine power factor to at least 0.95 would result in an annual cost saving of $39,000. The opportunity to improve power factor at the mine is clearly a financial benefit with the additional network benefit of freeing up network capacity.

Figure 8: Power factor 2007-2008 at NMINEE000978



3.4 Daily Electricity Usage

Electricity is used at Charbon Colliery by both the underground and open cut operations in the Underground mine electricity is used by production equipment, coal clearance system, ventilation fans, compressors, pumping offices, bathroom and workshop with the open cut use limited to shared use of the coal clearance system and the coal handling and coal preparation plant and a compressor see table 5 below for breakdown of electricity use.

Table 5: Breakdown of Electricity Use for 2007-2008

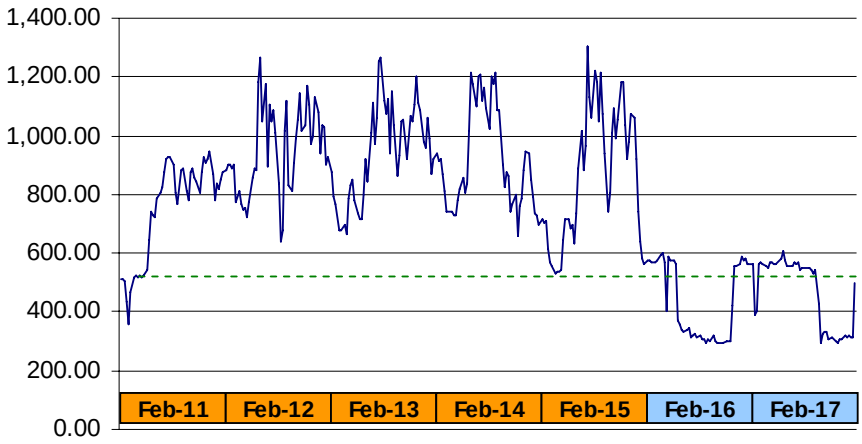
Electrical Energy End Use	Operation Used By	Electricity used kWh	% of Total
Compressed Air	U/G and OC	2,399,044	20.15%
Continuous mining Equip	U/G	2,430,274	20.41%
CHP/ CPP	U/G and OC	2,317,547	19.46%
U/G Conveyors	U/G and OC	2,178,887	18.30%
U/G Pumps	U/G	786,240	6.60%
Ventilation Fans	U/G	815,562	6.85%
Other Surface	U/G	980,002	8.23%
Total		**11,907,556**	**100.00%**

During the 2007-2008 period was based on the underground mine operating 24hours each day 5 days per week with production occurring on day and afternoon shifts and maintenance on the night shift and Saturdays.

The open cut production hours are between 7.00am and 4.30pm Monday to Friday and every second Saturday from 7.00am to 3.00pm, Maintenance and coal loading from open cut ROM stockpile onto coal clearance system is carried out Monday to Friday on afternoon shift

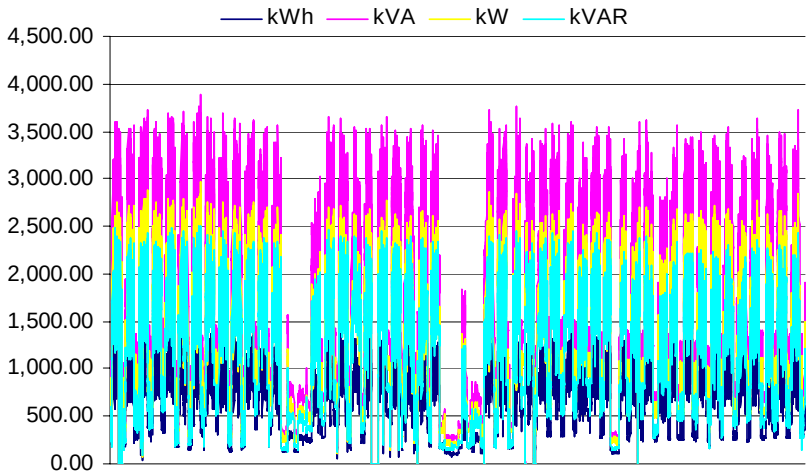
This pattern is reflected in figure 9 below, electrical energy consumption for week of February 11th to 17th with the base energy level of approximately 510kWh evident along with the weekday production and weekend energy use easily noted as is the mine base load consisting of Ventilation Fans, Compressors (for underground air diaphragm pumps) other pumping and surface facility loads.

Figure 9: Daily energy Consumption 11 Feb – 17 Feb 2008 at NMI NEEE000978



Interval data for the 2007-2008 year in figure 10 below shows consistent use of electricity with periods of reduced consumption in October 2007, December 2007 and January 2008 that are attributable to lower production and consequent lower washery throughput.

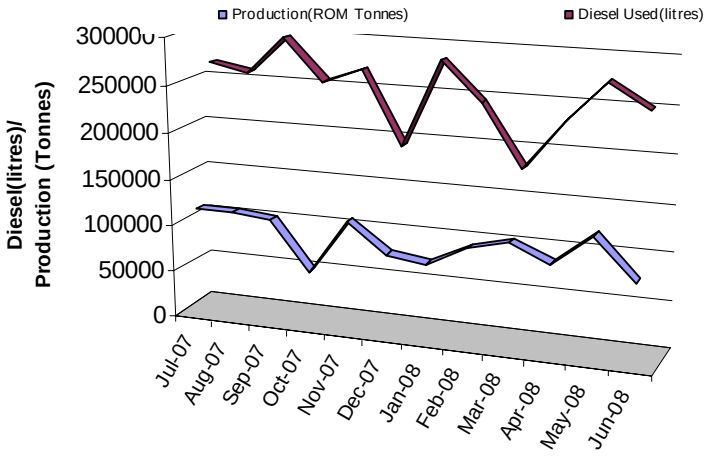
Figure 10: Full year Interval data NMI: - NEEE000978 2007-2008



3.5 Diesel Fuel Usage

Diesel fuel usage for the 2007-2008 year was 2,994,380 litres of which approximately 88% was used for open cut operations. with 3.5% used underground for transporting equipment, men and materials into and out of the mine as required by the mining operations and a further 8.7% was used by the coal handling/ coal preparation process see figure 11 below comparing monthly diesel fuel use and production. The average monthly diesel use was 249.5kL.

Figure 11: Diesel Fuel Use and Production 2007-2008



Further evaluation of diesel use is shown in table 6 below with the 88% attributed to open cut operation including 2.88% for blasting, 3.35% electricity generation for open cut offices and workshop, 4.18% used for personnel transport

Table 6: Breakdown of Diesel End Use for 2007-2008

Diesel Energy End Use	Diesel used Litres	Energy GJ	% of Diesel Energy
U/G Diesel Vehicles	105,463	4071	3.52%
O/C Production Equipment	2315555	89380	77.34%
O/C Blasting	86055	3322	2.87%
O/C Generators	100380	3875	3.35%
O/C Personnel Transport	125000	4825	4.18%
CHP/ CPP coal handling	261927	10089	8.73%
Total	**2994380**	**115562**	**100.00%**

3.6 Diesel Energy Cost

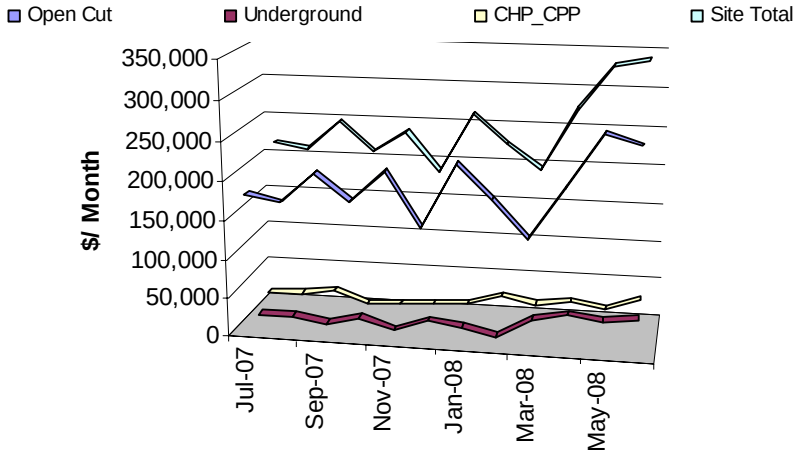
Diesel use at Charbon Colliery cost more than $2.58 million in 2007-2008 ($2.09 per tonne).This represents a monthly average cost of $244,628**.** The site usage and cost of diesel energy for open cut underground and surface operation below in table 7 with and figure 12 showing the monthly costs.

CHARBON COAL

Table 7: Monthly Usage and Cost of Diesel for Open Cut, Underground, CHP/ CPP and Site Total

Month	Open Cut				Underground				CHP/ CPP				Site Total			
	Litres	$/ Month ex GST & Excise	Tonnes	$/ Tonne	Litres	$/ Month ex GST & Excise	Tonnes	$/ Tonne	Litres	$/ Month ex GST & Excise	Tonnes	$/ Tonne	Litres	$/ Month ex GST & Excise	Tonnes	$/ Tonne
Jul 07	235,091	180,396	55630	3.24	8902	10,355	61873	0.17	22,003	25502	117503	0.22	265,996	216,253	117503	1.84
Aug 07	225,451	172,438	50599	3.41	8736	10,287	67511	0.15	22,904	26315	118110	0.22	257,091	209,040	118110	1.77
Sep 07	261,568	211,509	60080	3.52	8704	3,380	52574	0.06	27,222	32507	112654	0.29	297,494	247,396	112654	2.20
Oct 07	226,335	178,258	25720	6.93	12043	14,187	35503	0.40	14,363	16973	61223	0.28	252,741	209,417	61223	3.42
Nov 07	252,200	216,771	61040	3.55	0	0	58562	0.00	16,359	20317	119602	0.17	268,559	237,088	119602	1.98
Dec 07	162,550	149,000	49040	3.04	11500	14,745	39657	0.37	18,254	23591	88697	0.27	192,304	187,336	88697	2.11
Jan 08	251,469	230,016	44880	5.13	14172	9,275	38628	0.24	18,550	24744	83508	0.30	284,191	264,035	83508	3.16
Feb 08	214,235	188,045	44680	4.21	0	0	60711	0.00	29,689	37976	105391	0.36	243,924	226,021	105391	2.14
Mar 08	147,796	141,260	67040	2.11	9502	24,326	48111	0.51	22,007	29635	115151	0.26	179,305	195,221	115151	1.70
Apr 08	195,346	205,915	42200	4.88	11002	33,296	55628	0.60	24,620	35423	97828	0.36	230,968	274,633	97828	2.81
May 08	242,717	273,395	67120	4.07	11500	28,216	63866	0.44	18,955	28742	130986	0.22	273,172	330,354	130986	2.52
Jun 08	212,232	261,258	31960	8.17	9402	33,306	55141	0.60	27,001	44183	87101	0.51	248,635	338,748	87101	3.89
	2,626,990	**2,408,262**	**599989**	**4.01**	**105463**	**181,373**	**637765**	**0.28**	**261927**	**345,907**	**1237754**	**0.28**	**2994380**	**2,589,635**	**1237754**	**2.09**

Figure 12: Monthly Cost of Diesel for Open cut, Underground, Coal Handling and Preparation, and Site Total



3.7 CO2 Equivalent

The total energy consumption gave rise to greenhouse gas emissions of:

- Diesel fuel (2994.3klitres) 115583GJ (16.16%) approximating **8,692TCO$_2$** e and
- Electricity (11,908MWH) being 42,868GJ (83.84%) approximating **12,646TCO$_2$** e

This is calculated using the 'National Greenhouse Accounts (NGA) conversion factor for NSW of 0.297 kg CO_2-e per GJ of electricity use, as reported in the 'National Greenhouse Accounts (NGA) Factors November 2008'

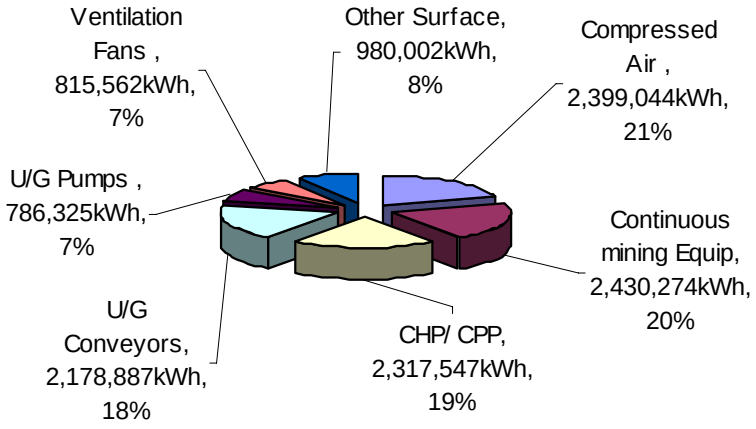
3.8 Load Distribution

Electricity metering at Charbon Colliery comprises supply authority meters for the Main Incoming Supplies for Charbon Coal, Charbon Road, NMI NEEE000978 and Charbon Pump Station Cooper drive, NMI NEEE002166 these meters are used by the Electricity supplier to measure the total incoming kW, kWh, kVA demand and Power Factor for the mine. No other sub metering of kWh is installed

Charbon has a base load demand of about 510kWh (seen in figure 9 above), this load is a direct result of the ventilation fans, Pumping, air compressors, bathhouse space and water heating, offices, workshops energy usage, and transformer losses making up more than 40% of the mine electrical load

An estimate of electricity use by load grouping is shown below in figure 13

Figure 13: Electricity use by load group



4. MONITORING AND CONTROL SYSTEMS

Charbon Colliery has an older generation CITEC system for the washery control system that provides only local control and monitoring with no effective data collection or trending available

The underground mine currently has no usable SCADA capability and is in the process of seeking approval for the acquisition of a CITEC system to provide the mine operating personnel with information pertaining to the day to day operations such as equipment run, stopped, fault conditions diagnostics, coal and water flows, bin levels and loading on underground equipment this system will also provide useful plant and equipment energy use data that can be utilised to improve future energy use.

5. MINESITE INFRASTRUCTURE

5.1 Ventilation Fans

The mine has a Main and a supplementary Fan in operation. The main fan is driven by a 132kW motor with the supplementary fan drive being 75kW. Both fans are operated 24hours per day 365 days per year providing the mine with a ventilation flow rate of 168m^3/sec at a combined motor load of 93kW

The fans operation has remained mostly unchanged for the baseline year with only minor interruptions to carry out planned maintenance activities, or during unplanned power outages.

At this loading the ventilation fans consume about 2241kWh per day, for a total annual energy consumption of approximately 0.815GWh – or 7% of site electricity for 2007 -2008 see table 8 below showing fan duty.

Table 8: Ventilation Fan Operating Data

	Main Fan	Supplementary Fan	Total
Motor rated kW	132	75	207
Voltage	415	415	
Motor Current	90	82	172
Power factor	0.76	0.76	0.82
Motor kW used	49	45	93
kVA	37	34	71
Flow (M^3/Sec)	100	66	166
kWh/ day	1172	1068	**2241**
kWh/ year	426748	388815	815562
MWh/ year	428	390	818
GWh/ year	0.43	0.39	**0.82**
GJ/ year	1541	1404	**2944**

5.2 Air Compressors

The site has 3 air compressors that run fully loaded on an almost continuous basis with each being utilised more than 95% of the time to supply air underground for use by air diaphragm pumps, trickle dusters and other air driven tools and equipment, in addition the compressed air system has leakage associated with long runs of Victaulic pipelines

The compressed air system electrical load is 274kW consuming approximately 11.91GWh of electricity usage per annum – which represents approximately 20 % (figure 13) of the mines 2007-2008 energy use

Two of the compressor units are located at the mine pit top with the 3rd unit being located at 8 trunk entry some 5 klm from the mine entry and adjacent the open cut workshop the location of this compressor reduces the impact of losses in the air lines

The reticulation and use of compressed air exists in a dynamic environment where the configuration of compressed air lines and end use equipment changes regularly.

Leakage is a significant factor in compressed air use underground and while compressed air leaks are often identified and fixed in as part of the day to day operation, it is not part of any routine maintenance program.

5.3 Washery

The Charbon Washery averages 220 tonne per hour operating 24 hours per day 5 days per week with 2 x 12 and 1 x 11 hour shifts on weekends. See table 9 below Washery annual performance 2007-2008

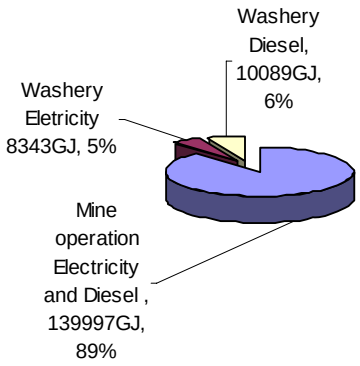
The plant that receives coal directly from the mining operation both underground and open cut via the mine trunk conveyor system or alternatively from coal stockpiled by the mine stackout/ reclaim system adjacent the plant with finished product being stockpiled and dispatched by road to meet domestic contracts and via the rail loading facility for export customers.

The Washery uses electrical 8,343GJ/ year and diesel energy10,089GJ equalling 11% of total energy used (refer to table 9 and figure 14 following).

Table 9 Washery Annual Performance 2007-2008

Washery Data			
Mine production 07-08	1237754	Tonnes	
Ave plant throughput	220.00	T/hr	
Available Operating Hours	8060	hrs/ yr	
Operating Hours	5626	hrs/ yr	
Estimated Electricity used 07-08	**2,317,547**	kWh	8343.17 GJ
Diesel used 07-08	**261,377**	Litres	10089.2 GJ
	Total energy used		**18432.3** GJ

Figure14 Washery Energy Performance 2007-2008



5.4 Underground Mining Operations

The Charbon underground operation comprises 2 production units the first a super panel (development) has 2 12 continuous miners, 3 shuttle cars & a ratio feeder.

The second unit (extraction) has 1 continuous miner, 2 shuttle cars a ratio feeder and 3 Breaker Line Supports.

Production occurs on 2 shifts each day the super panel produces on day shift only and the extraction unit producing on both day and afternoon shifts. The super panel and associated equipment is maintained on afternoon shifts with maintenance on night shift for the extraction panel and conveyors

Estimated electrical energy used is 20% of the total electricity use for the mine 11.9GWh per year (see figure 13).

5.5 Underground Conveyors

The mine has 15 conveyors in the underground system refer to table 10 with a collective nameplate rating of 2325kW. The operation of underground conveyors results in and estimated 2.17GWh or 18.3% of the mine electricity use.

Table 10: Underground Conveyors

Description	Rated kW	Drive type	Estimated kW	Estimated kWh
1 Trunk	150	Soft Starter	60	259200
2 Trunk	150	Soft Starter	60	259200
3 Trunk	75	Soft Starter	30	129600
4A	150	Soft Starter	60	259200
4B	150	Soft Starter	60	259200
Bin			5	
Feeder			5	21600
4C	150	Soft Starter	60	259200
Rotary Breaker	55	DOL	22	95040
Hexam Feeder			6	25920
8A	370	Soft Starter	148	639360
810	150	DOL+ F/coupling	60	259200
8B	300	DOL+ F/coupling	117	505440
8C	150	Soft Starter	60	259200
9	250	DOL+ F/coupling	100	432000
903	75	Soft Starter	30	129600
904	75	Soft Starter	30	129600
905	75	Soft Starter	30	129600
			943	**2178887**

5.6 Underground Pumping

Mine dewatering relies on both compressed air and electricity uses 1.89GWh, 2.4% of energy used at the mine and comprises

Air pumping utilizes 26 pumps that use approx 70cfm under no load with many of them only operating after rain with most pumps operating on snore for the majority of the time.

Electric pumps in use are as follows

Table 11: Electric Pumps

Location	Pump Type	Rated kW	Run time	Hrs/ yr	kWh
Reedy Creek	Mono	11	24x7x60%	5,242	46,126
Incoming Town Water	Centrifugal	15	24x7	8,736	104,832
Fire Fighting Pressure	MS Centrifugal	18	24x7	8,736	125,798
Fire Fighting system from U/G	Submersible	20	24x5	6,240	99,840
Fire Fighting system from U/G	Centrifugal	37	24x5	6,240	184,704
	MS Centrifugal	22	24x5	6,240	109,824
Underground	Mono	2	24x7	8,736	13,978
Underground	Mono	2	24x7x20%	1,747	2,796
Underground	Mono	2	24x7x20%	1,747	2,796
Underground	Submersible	3.7	24x7x5%	437	1,293
Underground	Submersible	3.7	24x7x5%	437	1,293
Underground fish tank	Centrifugal	22	24x7x50%	4,368	76,877
Underground fish tank	Centrifugal	37	24x7x10%	874	25,859
			Total kWh estimated		**796,014**

5.7 Mine Office, Bath House and Workshops

There were approximately 103 employees and contractors using the mine office/ bath house, workshops during the 2007 – 2008 year consuming an estimated 980GWh of electricity per annum (2.23% of energy used refer to table 11 below and figure 15 following) to provide light and power, air conditioning and water heating for these personnel.

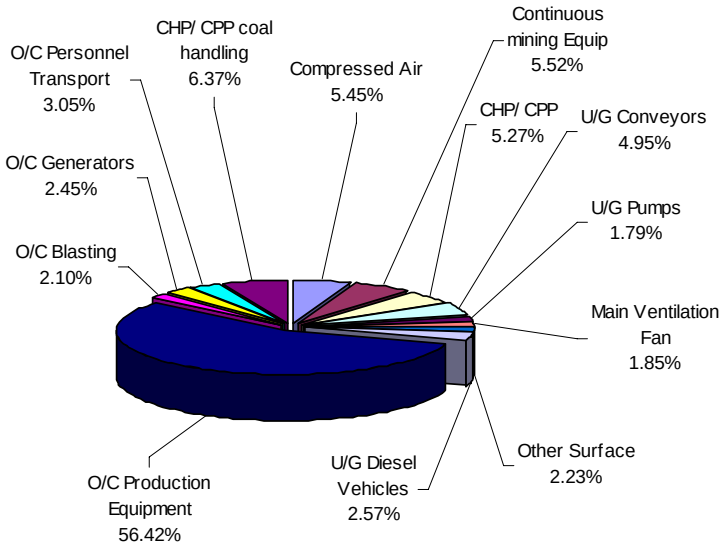
6. SUMMARY OF OVERALL ENERGY END-USAGE

In summary, the assessment of energy at an end-use level at Charbon indicates that consumption by major equipment for the 2007-2008 financial year was158,492GWh inclusive of electricity and diesel fuel. (see table 12 and figure 15 below)

Table 11: Energy (Electricity and Diesel) End-Use

Energy End Use	Energy Type	Unit kWh/ Litre	GJ	% of Total
Compressed Air	Electricity	2,398,378	8634	5.45%
Continuous mining Equip	Electricity	2,430,274	8749	5.52%
CHP/ CPP	Electricity	2,317,547	8343	5.27%
U/G Conveyors	Electricity	2,178,887	7844	4.95%
U/G Pumps	Electricity	786,894	2833	1.79%
Main Ventilation Fan	Electricity	815,562	2936	1.85%
Other Surface	Electricity	980,002	3528	2.23%
U/G Diesel Vehicles	Diesel Fuel	105,463	4071	2.57%
O/C Production Equipment	Diesel Fuel	2,315,555	89380	56.42%
O/C Blasting	Diesel Fuel	86,055	3322	2.10%
O/C Generators	Diesel Fuel	100,380	3875	2.45%
O/C Personnel Transport	Diesel Fuel	125,000	4825	3.05%
CHP/ CPP coal handling	Diesel Fuel	261927	10089	6.37%
	Total		**158,429**	**100.00%**

Figure 15: Energy (Electricity and Diesel) End-Use



7. ENERGY MANAGEMENT REVIEW

The Energy Management review conducted at the site used the Energetics One-2-Five®Energy management tool, and was combined with a brainstorming session to identify a range of ideas for energy saving at the Angus Place Colliery site.

The diversity in roles of the people involved in the development of this ESAP reflects the site's commitment to energy management, via the involvement of production, engineering, environmental and commercial management at a site level, together with corporate support.

The workshop meeting was held on site at Charbon Colliery Office on Feb 17, 2009 the participants are listed below in table 12.

Table 12: Energy Management Review Attendees

Name	Position
Grant Watson	Mine Manager
Russel Cooper	Under Manager
Rod Pitstock	Mine Electrical Engineer
Peter Gardiner	Mine Mechanical Engineer
Kevin James	Manager Mechanical Engineering
Greg Munday	CHHP/ Washery Engineer
Matt Gray	Environment and Community Coordinator
Minnie Macdonald-Webster	Stores and Purchasing officer
Rod Wilson	Maintenance and Planning
Andrew Pix	Project Manager
Geoff Hillier	Big Rim Manager
Kevin Millington	Centennial Coal
Rob Thomson	Energetics Project Manager
Phil Shorten	Energetics Project Manager

8. ENERGY MANAGEMENT REVIEW RESULTS

Charbon achieved one star in the One-2-Five®Energy review, which performance maps as follows to the DECC review requirements set out in the Energy Savings Action Plan Guidelines:

The results of the review are summarised below in table 13

Table 13: Energy Management Review Results

Template 2 – Management Review Process

Back to Introduction

Area No.	Review Area	Rating				
		Low	Moderate	Minimum Sustainable	Industry leader	Best practice
A	Senior management commitment	No activity/absent	Informal management practices	Executive-level management policy for improving energy efficiency or reducing energy costs that includes targets. This policy is reported on the organisation's web-site and in Annual Reports and communicated to all employees. Sub-targets are established for major facilities, and regularly updated.	In addition to minimum sustainable, business practices are routinely audited, and publicly reported.	In addition to industry leader, organisations can demonstrate that energy management is ingrained into corporate culture.
B	Understanding of energy savings potential	No activity/absent	Informal management practices	Energy efficiency opportunities are based on a comprehensive review of energy use by major users, and of savings opportunities in each major operation covering operating procedures, maintenance procedures, and capital works.	Cost-effective measures are routinely implemented, energy operating and maintenance procedures for energy intensive plant, and documented internal communications strategy implemented.	In addition to industry leader, all innovation measures implemented.
C	Energy targets and key performance indicators	No activity/absent	Informal management practices	KPIs established and tracked monthly for large sites, and grouped to allow for internal benchmarking of similar facilities where applicable. Sites have routine visibility of this data, and review thoroughly where they show large variance from target.	In addition to minimum sustainable, KPIs are included in job description.	In addition to industry leader, KPIs are benchmarked against world best practice performance and facilities in top quartile.
D	Energy metering and monitoring	No activity/absent	Informal management practices	Organisations maintain a baseline database for all sites, and basic plant monitoring enables access to interval metering data for major energy streams.	In addition to minimum sustainable, sub-metering installed throughout plant and results reported and tracked at regular management meetings.	Energy consumption metered as per Industry Leader, regular reporting of consumption at board level.
E	Energy management reporting	No activity/absent	Informal management practices	Organisations report savings opportunities with extended payback periods (>5 years) and whether they plan to implement these measures and over what time-frame.	In addition to minimum sustainable, business practices are routinely audited, and publicly reported.	In addition to industry leader, organisations can demonstrate that energy management is ingrained into corporate culture.
F	Energy supply management	No activity/absent	Informal management practices	Organisations have formal processes for energy procurement, and assess opportunities for alternative energy supply options based on capital and operating costs	In addition to minimum sustainable, product life cycles studies are carried out.	In addition to industry leader, organisation acts on product life cycle measures to reduce cradle to grave impacts.
G	Operating and maintenance procedures	No activity/absent	Informal management practices	Opportunities assessment includes potential improvements to operating and maintenance procedures, and planned projects to improve energy efficiency incorporate formal operating procedures and training to ensure sustainability.	In addition to minimum sustainable, product life cycles studies are carried out.	In addition to industry leader, organisation acts on product life cycle measures to reduce cradle to grave impacts.
H	Accountabilities for energy management	No activity/absent	Informal management practices	Organisations have an executive-level manager who is accountable for energy management, together with at least one person at each site and an energy management group that coordinates energy management activities at major sites.	In addition to minimum sustainable, KPIs are included in job description.	In addition to industry leader, KPIs are benchmarked against world best practice performance and in top quartile.
I	Training and awareness procedures	No activity/absent	Informal management practices	Basic energy-awareness activities are in place at each major facility, and energy management training is provided to operations and maintenance teams in energy intensive areas.	In addition to minimum sustainable, business practices are routinely audited, and publicly reported.	In addition to industry leader, organisations can demonstrate that energy management is ingrained into corporate culture.
J	Compliance with legal and/or regulatory requirements	Regularly fails compliance requirements	Occasionally fails compliance requirements	Limited compliance failures	Compliance within allowable limits	Consistently above compliance requirements

8.1 Energy Management System Actions

From above, the management areas that require the most focus are those where Charbon has indicated current performance is either Low or Moderate. In general, the review indicates that senior management commitment is present, energy saving potential is well understood, energy KPI's and Targets exist and that good baseline energy monitoring and metering is in place, sufficient personnel, reporting and procedures are in place to manage energy use or waste, however full benefits are not yet realized.

Energy management is not a formal agenda item discussed at mine management level, operating and maintenance procedures do not specifically address energy use or waste and planning for the future redevelopment of the mine needs to incorporate energy efficient designs into process and equipment

Greater awareness of energy use/ waste to be created through training

Based on the management review, specific actions see Table 14 have been identified to address these areas include:

The actions identified are necessary to take advantage of energy saving opportunities and to engage staff in energy saving actions where these are cost effective and add value to the business.

It was noted during the course of assessments that there is no effective site SCADA systems to collect the data that is necessary to monitor and aid in evaluating potential savings for all major equipment as such it was identified that investment is necessary to allow suitable extraction of data and reporting templates that can make this information available and useful for analysis of potential opportunities greatly assisting in presenting future business cases for energy savings opportunities to management.

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Table 14: Management System Actions

Management System Action	Responsibility
1. Energy Management Reporting a) Develop weekly/ monthly management meeting agendas to included energy management. b) Introduce new agendas to meetings c) Set overall energy savings targets for reducing energy costs or improving energy efficiency based on benchmarking or an assessment of opportunities. c) Monitor energy use/ energy waste and energy projects against KPIs via routine management meetings	Mine Manager, Under manager in Charge Mechanical and Electrical Engineers
2. Accountability a) Communicate energy policy and specific goals and objectives for improving energy efficiency and reducing energy costs. b) Select one person to be responsible for energy management at site c) Assign accountability for energy management directly to end users (e.g. supervisors and teams) d) Use shift supervisors to support end users in improving energy performance.	Mine Manager, Under manager in Charge Mechanical and Electrical Engineers
3. Operating Procedures a) Review plant and equipment operating procedures to ensure efficient energy use and eliminate energy waste. b) Implement changes to operating procedures identified c) Monitor Operating energy use/ waste	Under manager in Charge Mechanical and Electrical Engineers
4. Maintenance Procedures a) Review plant and equipment maintenance procedures to ensure efficient energy use and eliminate energy waste. b) Implement changes to maintenance procedures identified c) Monitor maintenance energy use/ waste d) Take prompt corrective action once an energy wasting condition is identified.	Under manager in Charge, Mechanical and Electrical Engineers
5. Awareness and training a) Conduct basic energy-awareness activities with all site personnel focusing on cost savings and environmental issues associated with energy use. b) Disseminate the information using tools such as the company web site, newsletter or tool box talks.	Under manager in Charge Mechanical and Electrical Engineers
6. Long Term Planning a) Develop and Include a strategic, long term energy efficiency plan into mine planning with specific actions to improve energy performance and management systems b) Implement an annual planning process that identifies all priority projects, schedules, responsibilities and budgets. c) Evaluate plans to ensure energy efficient equipment and processes are to be implemented	Mine manager & Mine Planning Team

9. POTENTIAL ENERGY SAVING PROJECT OPPORTUNITIES

9.1 Decision Making Criteria

A number of criteria for decision-making in relation to energy efficiency projects were highlighted during the workshop. These include:

9.1.1 Economic

- Energy waste identified / change in operation required with minimal effort/cost

- Low cost, cost effective measure - Implement now
- Payback 1 -2 years - seek funding in site annual Business Plan
- Payback 3-4 years - Implement with Centennial Energy Efficiency Fund (CEEF) approval
- Payback +4 years - Review implementation

9.1.2 Project Type

The following factors were taken into account when assessing potential opportunities for energy saving during the technical review.

- Sustaining projects
- Enhancing projects

9.1.3 Other Benefits/Factors

The impact, if any, of other factors on project decisions such as:

- Productivity improvement with similar energy consumption
- technology considerations,
- safety,
- maintenance effectiveness and
- Corporate objectives and sustainability/ environment.

Table 15 details all potential projects identified at Charbon, a number of which have been evaluated in preparation for implementation with others to be the subject of future investigations.

The energy saving actions to be included in this plan have been set out in a standardized template that describes each individual action, with supporting information. This format will be of assistance for seeking funding for the projects as the relevant information can be copied from this template direct to a Capital Expenditure Approval (CEA).

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Table15: Summary of outcomes from opportunity raising workshop

Project ID	Area	Project Description	Current Status	Comment	Next Steps	Project Sponser	Rank 1= do it now , 5= do it later
CEY00140	Power System	Improve Power Factor	To be Implemented	Approx cost$300k-$400k to improve to > 0.95PF will save $40k/ year will improve mine distribution and network capability	Get base data. Contact suppliers design/ price and delivery	Rod	1
CEY00141	Power System	Transformer substation overhaul	To be Implemented	Future benefit for new mine	Contact Integral Energy. Organise site inspections. Review AUS STD AS 3000 etc	Rod Pitstock/ Andy Dix	1
CEY00142	Systems/ Procedures	Ensure all deliveries to correct area	Implemented	Minnie managing suppliers/ deliveries	Educate freight companies/ Suppliers	Minnie	1
CEY00143	U/G Equipment	Repair Hydraulic leaks	To be Implemented	Not Viable energy saving project See notes Below	Talk with maintenance	Peter	2
CEY00144	Diesel	Reduce idle time (prestart) of O/C machines	Under Investigation		Talk with maintenance Superintendant	Geoff H	2
CEY00145	Power System	Total lighting audit	Under Investigation		Out of budget approval based on proposal provided for the services	Matt	3
CEY00146	Diesel	Provision of facilities at sthn O/C to reduce truck movements from sthn O/C to 3rd entry	Under Investigation	Discussed with Ron Leo,Depends on new leases being approved.	Discuss with Ron Leo this week	Geoff H	2
CEY00147	Diesel	Stockpile Management to minimise pushing in	Implemented	1 train a day is ideal Good continued communications with Marketing & our Shipping Agent	End Feb 2009	Buster	1
CEY00148	Diesel	Plant to only operate as required at washery to keep diesel usage to a minimum	Implementation commenced	CITEC project started Commincations network under way with underground system & CHPP	Oct-09	Buster	1
CEY00149	Diesel	Use lower emmission and/or ethanol/biodiesel blends in O/C machines	Under Investigation	Ron and Tony Leo investigating. No outcome to date	Discuss with Ron Leo. And gather data (Matt?)	Geoff H	3
CEY00150	Pumping	Solar pump for dam	Under Investigation		Get costs from suppliers	Matt	4
CEY00151	Pumping	Turbine suppliment solar pumps	Under Investigation		End Feb 2009	Matt	4
CEY00152	Washery	Flocculant system automation and control	implementation commenced	some equipment onsite up to 25% reduction in floc usage depending on Rom coal also.	Oct-09	Buster	1
CEY00153	Washery	Plant upgrade to reduce magnetite usage	implementation commenced	consultants involved	Jun-09	Buster	1
CEY00154	Systems/ Procedures	Change consent conditions to allow increased loading at 810 (reduce trucking to 3rd entry)	Under Investigation	This is part of the new DA about to be submitted we expect to have consent around October	Part of new Dues Consent	Grant	2
CEY00155	Systems/ Procedures	Cut coal on N/S (optimise off peak)	Under Investigation		Assess viability, cost benefit, swot, consultation	Grant	3
CEY00156	Monitoring	Improve process control	implementation commenced	CITEC project started Commincations network under way with underground system & CHPP	Ordered equipment being built	Rod	1
CEY00157	Pumping	Shut black tank down	Implemented	Done in Mar 5 this year	Investigate and JDI	Russel	1
CEY00158	Ventilation	Shut supplementary fan down at weekends	Implemented	Done April 20 this year	Investigate and JDI	Russel	1
CEY00159	Conveyors	Turn belts off on N/S	Under Investigation	Cost $140k/ year Deputy to do inspections will most likey occur when mine employs new deputy	Investigate	Russel	3
CEY00160	Compressed Air	Audit Air lines , investigate leaks & redundant bends/pipework	Implemented	DONE see notes below	Organise audit by fitters. List leaks	Peter	1
CEY00161	?	Carbon capture , rehab soil research	Under Investigation		ACARP/ W&MMS	Matt	
CEY00162	Monitoring	Install metering in current budget	To be Implemented	Need to imprive sub metering to allow further evaluation of energy use	Contractor (Bob Taylor) Investigation	Rod	1
CEY00163	Pumping	Mine water supply high pressure pumps operating on demand	Under Investigation	Create "On Demand flow and pressure reduce water recirculation	Review Millar Agencies Report	Steve/ Rod	2

9.2 Projects to be Considered

The following energy saving opportunities business case assessments have been completed and will be implemented:

- Power Factor Correction
- Shutdown Supplementary Fan at Weekends
- Compressed Air System leaks
- Dam Solar Pump
- Shutdown Black Tanks pump
- CITECT System (Improve process control)
- Install sub metering
- Reduce idle time (prestart) of O/C machines
- Turn Belts off on Night shifts

Investigations will be carried out for the following opportunities;

- Total lighting audit
- Provision of facilities at southern O/C to reduce truck movements from southern O/C to 3rd entry
- Use lower emission and/or ethanol/biodiesel blends in O/C machines
- Evaluate transformer spare capacity at 4 trunk to provide power to OC workshop and offices Monday to Friday(while U/G power on)
- Change consent conditions to allow increased loading at 810 (reduce trucking to 3rd entry)
- Carbon capture , rehab soil research
- Mine water supply high pressure pumps operating on demand

10. ENERGY SAVINGS

Of the projects to be considered, the Energy Savings Measures as detailed in Appendix 2. They outline:

- Cost to implement,
- Energy savings and
- Payback.

The

11. APPENDICES

- Appendix 1 Annual Report on Energy Use (DECC Template 1)
- Appendix 2 Energy saving measures (DECC Template 4)
- Appendix 3 to 10 description, justification and evaluation details of the opportunities listed above together with their supporting analysis.

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11.1 Appendix 1 Annual Report on Energy Use

Template 1 - Annual report on energy use

Back to Introduction

Energy consumption should be reported in GJ and can be calculated using the Energy Use Calculator below.

Organisation Name	Charbon Coal Pty, Ltd.
Site Name	Charbon Colliery
Site Address	Charbon Road, Charbon
Baseline energy use (from ESAP)	**158,169GJ**
Baseline energy use KPI (from ESAP)	**0.128GJ/tonne**
Current report start date	**01-July-2007**
Current report end date	**30-June-2008**
Projects implemented	
Estimated energy savings p.a.	
A = Current energy use per annum (GJ)	**158,169**
Greenhouse Emissions (tCO2-e)	**21,317**
Is current energy use representative of normal Energy use YES/NO	**Yes**
If NO, description of variation (e.g. restrictions, shutdown, refurbishment etc)	
B = Impact of variation on energy use (i.e. variation from normal) GJ per annum	0
C = A - B baseline energy use corrected for variation (GJ)	**158169**
Business Activity Indicators	**Tonne (Run of Mine)**
D = Quantity of Site Business Activity Indicator per annum (corrected for variations)	**1237754**
E = C / D baseline Energy use key performance indicator (KPI)	**0.128**
Baseline KPI units (ie energy units / Business indicator eg GJ/m2)	**GJ/ Tonne(run of mine)**
Baseline summer peak Demand (kVA)	TBA
Baseline winter peak Demand (kVA)	TBA

11.2 Appendix 2 Energy Savings Measures

TEMPLATE 4 – Energy Savings Measures												
Site name		CHARBON COLLIERY										
Project No.	Measure Description	Cost to Implement $	Energy savings GJ p.a.	Greenhouse gas reduction tCO2 p.a.	Winter peak demand reduction kVA	Summer peak demand reduction kVA	Energy cost savings $ p.a.	Peak demand cost savings $ p.a.	Maintenance or other cost savings $ p.a.	Payback period years	Completion Date	
Energy consumption should be reported in GJ and can be calculated using the Energy Savings Calculator below.												
Projects implemented since last report												
CEY00140	Install power factor correction equipment	350000	No direct energy saved , Improved network efficiency		740	740	0	40000	0	8.75	Feb-10	
CEY00157	Shutdown black tank pump	750	148	44	88	88	1775	13	495	0.33	Apr-09	
CEY00150	Dam solar pump	15000	146	11	0	0	6278	0	10600	0.89	Jun-09	
CEY00148/ CEY00156	CITECT monitoring and process control	300000	Not yet determined	Not yet determined	Additional metering will assist mine to identify further enegy saving opportunities				30000	10.00	Sep-09	
CEY00158	Shut supplementary fan down at weekends	2500	300	88	48	48	3590	262	1071	0.51	Apr-09	
CEY00162	Install metering in current budget	5000	Not yet determined	Not yet determined	Additional metering will assist mine to identify further enegy saving opportunities					#DIV/0!	Jul-09	
CEY00160	Audit Air lines , investigate leaks & redundant bends/pipework	17000	716	211	116	116	8614	630	1200	1.63	May-09	
CEY00144	Reduce Idle Time of Open Cut machines	500	963	74	0	0	23014	0	592	0.021181056	Mar-09	
CEY00159	Turn Belts off on Night shifts	40000	1569	463	51	51	18776	275	120000	0.29	Apr-09	
TOTALS			**3842**	**891**	**1043**	**1043**	**62047**	**41180**	**163958**	0.00		
							Total Energy Savings as a Percentage of Total Site Use (%)					**2.42%**

11.3 Appendix 3 Power Factor Correction

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION		
PROJECT: POWER FACTOR CORRECTION		**DATE: June 2008**
PROJECT DESCRIPTION		**VALUE**
Description:	Design and install a Power Factor Correction system to improve mine power factor to greater than 0.95	$350,000
Related Project(s):		$
START DATE: August 2009	**COMPLETION DATE**:	**EXPECTED LIFE**: 10 years

JUSTIFICATION/EVALUATION:

- CURRENT STATUS: Without Power Factor Correction Charbon Colliery Power Factor averages 0.75 and as a result pay a premium on their energy bill ($3300 per month).
- EVALUATION: A preliminary design for a PFCU consisting of 3 stages of 0.5MvVAr each would provide the ability to improve power factor to better than 0.98 resulting improved network capability, reduces losses and financial saving. The estimated cost to design, manufacture, install and commission is approximately $350,000
- PROJECTED OUTCOMES: Once installed and operating the mine Power factor will be greater than 0.95 with a resulting saving to the mine of $40,000 per year

	Annual	Life Cycle
Cost Savings	$40,000	$400,000
Energy Savings	0MWh	0MWh
Greenhouse Gas Savings	0 tonnes CO_2-e	0 tonnes CO_2-e
Payback Period, NPV, IRR	8.75 Years,	

1. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Excel spreadsheet analysis and Country Energy data

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
				Yes
Project Type	*Sustaining*		*Enhancing*	
			Yes	
Other Benefits / Factors	*Productivity*	*Safety*	*Other*	
			Yes- *Maintenance effort/ cost will be reduced*	

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION:	**YES**
FURTHER ACTIONS REQUIRED:	

Appendix 3a Power factor data from Country Energy

Charbon Coal NEEE000978 Month Beginning	AV P.F.	$ Sav @0.95 PF
01-Jul-07	0.7643	$ 3,011.65
01-Aug-07	0.7508	$ 3,247.12
01-Sep-07	0.7780	$ 3,332.94
01-Oct-07	0.7460	$ 3,472.84
01-Nov-07	0.7427	$ 3,132.38
01-Dec-07	0.7538	$ 3,265.87
01-Jan-08	0.7555	$ 3,291.82
01-Feb-08	0.7514	$ 3,217.03
01-Mar-08	0.7527	$ 3,272.39
01-Apr-08	0.7687	$ 3,269.51
01-May-08	0.7727	$ 3,044.67
01-Jun-08	0.7622	$ 3,202.85
YTD TOTAL		**$ 38,761.07**
AVERAGE	0.7582	$ 3,230.09

11.4 Appendix 4 Weekend Shutdown Supplementary Fan

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION			
PROJECT: Shutdown of Supplementary fan over weekends			**DATE: Sept 2008**
PROJECT DESCRIPTION			**VALUE**
Description:			$
Related Project(s):			$
START DATE:	**COMPLETION DATE**:		**EXPECTED LIFE**: 10 years

JUSTIFICATION/EVALUATION:

- CURRENT STATUS: The mine operates the Supplementary fan 7 days/ week 365 days / year using 389MWh of electricity
- EVALUATION: After investigating the potential impacts on mine operation it has been established that is safe to shut the supplementary fan down for up to 36 hours each weekend.
- PROJECTED OUTCOMES: A reduction of 83MWh of electricity saving 300GJ of energy and 83CO2eT along with a reduction in wear related maintenance will be realised.

	Annual	Life Cycle
Cost Savings	$4,600	$46,000
Energy Savings	83MWh	830MWh
Greenhouse Gas Savings	88 tonnes CO_2-e	880 tonnes CO_2-e
Payback Period, NPV, IRR	0.6 Years,	

2. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Excel spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
	Yes			
Project Type	*Sustaining*		*Enhancing*	
			Yes	

Other Benefits / Factors	*Productivity*	*Safety*	*Maintenance*
	Yes		Yes-Reduction in run time will transfer into reduced wear

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED: To be Implement	

Appendix 4a Shutdown Supplementary Fan analysis

Shutdown Supplementary Fan at Weekends	
Summary of Load reduction	**Value**
Average kWh of existing	815,562
Operating hours per year (7X24x52)	8,736
New operating hours per year (5.5X24x52)	6,864
Reduced kWh	83,317
New kwh per year	732,245
MWh saved per year	83
Energy saving GJ/ year	300
kVA demand reduction	48
CO2 e-T saved / year	88
% peak operating hours (2pm-8pm)	18.56%
% shoulder operating hours	38.70%
% off peak operating hours 10pm-7am)	42.72%
Yearly maintenance cost	$ 5,000.00
Additional labour Cost	$ 2,500.00
Total Estimated Savings	$ 4,661.41
Energy Savings	$ 3,589.98
Maximum Demand Savings	$ 262.41
Maintenance Savings	$ 1,071.43
Simple Payback (years)	0.54

11.5 Appendix 5- Compressed Air System Leaks

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION		
PROJECT: Regular inspection and repair of compressed air line leaks		**DATE: Aug 2009**
PROJECT DESCRIPTION		**VALUE**
Description:	Leakage is a significant factor in compressed air use underground. Air leaks are often identified and fixed in as part of the day to day operation, An audit of the system to be conducted to identify and grade leaks Prepare a plan to repair all leaks in order of severity with any future leaks found fixed promptly;	$17,000
Related Project(s):		$
START DATE: Aug 2009	**COMPLETION DATE**: Ongoing	**EXPECTED LIFE**: 10 years

JUSTIFICATION/EVALUATION:

CURRENT STATUS: The compressed air distribution network is highly dynamic, changing frequently as required by the operation. In the past audits of compressed air lines have been conducted but after initial remedial work done follow up inspections have not occurred. It is known that troublesome air leaks are being detected and repaired on an adhok basis but no formal program for inspection and repair exists

EVALUATION: In a compressed air reticulation system review at a similar centennial mine air lines/ valves that were no longer required, were found along with air leaks that are estimated to be causing around 10%-15% loss of system capacity

PROJECTED OUTCOMES: It is expected that a 10% improvement can be made by the programmed identification and repair of air leaks, restrictions or unwanted air lines creating a saving of about 199Mwh ($10,400) per year. The estimated cost to regularly inspect and repair air leaks is approximately $17,000 per year

	Annual	Life Cycle
Cost Savings	$10,400	$104,000
Energy Savings	199MWh	1,990MWh
Greenhouse Gas Savings	211 tonnes CO_2-e	2,110 tonnes CO_2-e
Payback Period, NPV, IRR	1.63 Years,	

3. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Excel spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
		Yes		
Project Type	*Sustaining*		*Enhancing*	
	Yes			

Other Benefits / Factors	*Productivity*	*Safety*	*Other*
			Yes – effective management of leaks can reduce future capital for new compressors

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

Appendix 5a Compressed Air Line Analysis

Air Line Audit/ Repair	Value
Initial kWh	1999234
kWh reduction (6% improvement)	199923
New kWh	1799311
New MWh	1799
kVA demand reduction	116
Ave operating hours/ yr	4883
New Energy cost/ yr	$ 77,528.73
MWh saved per year	199.92
% peak operating hours (2pm-8pm)	18.56%
% shoulder operating hours	38.70%
% off peak operating hours 10pm-7am)	42.72%
Total Estimated Savings	$ 10,443.95
Energy Savings	$ 8,614.30
Maximum Demand Savings	$ 629.65
Operating/ Maintenance Savings	$ 1,200.00
Capital Investment Cost	$ 17,000.00
Yearly Maintenance cost	$ 20,000.00
Avoided Capital Cost	$ -
Simple Payback (years)	1.63

11.6 Appendix 6- Dam Solar Pump

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION			
PROJECT: Dam Solar Pump			**DATE: June 2009**
PROJECT DESCRIPTION			**VALUE**
Description:	Purchase and install a solar powered pump to replace diesel powered pump		$15,000
Related Project(s):			$
START DATE: June 2009	**COMPLETION DATE**: Ongoing		**EXPECTED LIFE**: 10 years

JUSTIFICATION/EVALUATION:

CURRENT STATUS: The operation of a diesel powered dam pump requires daily attention to check/ fill with fuel and start. This pump uses over 1800litres of fuel/ year and requires daily inspection and fuel top ups

PROJECTED OUTCOMES: When the maintenance free solar powered pump is installed the diesel pump will be decommissioned and removed from use, inspections will only be required once per week Saving 1825 litres of diesel fuel (70.4GJ) costing $3,139) per year. In addition a 80% reduction in regular inspections that will save approximately $10,400 per year

	Annual	Life Cycle
Cost Savings	$13,739	$137,390
Energy Savings	70.4GJ	704GJ
Greenhouse Gas Savings	5.6 tonnes CO_2-e	56 tonnes CO_2-e
Payback Period, NPV, IRR	0.57 Years,	

4. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Excel spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
	Yes			
Project Type	*Sustaining*		*Enhancing*	
	Yes			

Other Benefits / Factors	*Productivity*	*Safety*	*Other*
			Yes – Small but effective use of renewable energy to create energy savings Solar panels pump and pipelines can be relocated after life of mine

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

Appendix 6a Dam Solar Pump Analysis

Dam Solar Pump	Value
Diesel fuel used per year (litres)	3650
Diesel cost per litre ($)	1.72
Daily (diesel pump)operating cost ($)	50
Yearly Maintenance costs	200
Energy used (GJ)	141
Reduction in energy use (GJ)	141
GJ saved per year	141
Total Estimated Cost Savings	$ 16,878.00
Diesel Energy Cost Savings	$ 6,278.00
Operating/ Maintenance Savings	$ 10,600.00
Capital Investment Cost	$ 15,000.00
Yearly operating/ Maintenance cost	$ 10,600.00
Avoided Capital Cost	$ -
Simple Payback	0.89

11.7 Appendix 7 – Shutdown Black Tanks Pump

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION			
PROJECT: Shutdown Black Tanks			**DATE: Mar 2009**
PROJECT DESCRIPTION			**VALUE**
Description:	Turnoff Black Tanks 22kW pump during weekends		$0
Related Project(s):			$
START DATE: March 2009	**COMPLETION DATE**: Ongoing	**EXPECTED LIFE**: 10 years	

JUSTIFICATION/EVALUATION:

CURRENT STATUS:A 22kW pump provides fresh water to the mine is operated 24hrs/ day 7days/ week 52 weeks/ year. With the mine not producing for 36 hours each weekend and opportunity to shutdown the pump and save the energy exists.

EVALUATION: Water supply from the black tanks is isolated from the underground workings each weekend to eliminate the risk of flooding in the event of a pipe failure while the mine is unattended. However the 22kW pump has been left running even though no need exists for water either for surface or underground use.

PROJECTED OUTCOMES: No negative impacts are expected during weekend periods and an energy saving of about 41MWh ($1,775) per year. In addition an operating/ maintenance cost saving of approximately $495 per year

	Annual	Life Cycle
Cost Savings	$2,287	$22,870
Energy Savings	41MWh	4,10MWh
Greenhouse Gas Savings	44 tonnes CO_2-e	440 tonnes CO_2-e
Payback Period, NPV, IRR	0.33 Years,	

5. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Excel spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
	Yes			
Project Type	*Sustaining*		*Enhancing*	
	Yes			
Other Benefits / Factors	*Productivity*	*Safety*	*Other*	

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

Appendix 7a Black Tanks Pump Weekend Shutdown Analysis

Shutdown Black Tanks	Value
Average kW of existing	22
Existing MWh/ year - operates for 24hrs/ day 7 days/ wk 52wks	192
MWh saved by reduced operation (36hrs/wk)	41
New MWh per year	151
kVA demand reduction	24
% peak operating hours (2pm-8pm)	18.56%
% shoulder operating hours	38.70%
% off peak operating hours (10pm-7am)	42.72%
Total estimated savings	$ 2,282.51
Energy savings	$ 1,774.54
Maximum demand savings	$ 12.97
Operating/ maintenance savings	$ 495.00
Investment cost	$ 750.00
Yearly operating/ maintenance cost	$ 1,500.00
Avoided capital cost	$ -
Simple Payback	0.33

11.8 Appendix 8 – CITECT System (Improve process control)

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION		
PROJECT: CITECT System (Improve process control)		**DATE: Mar 2009**
PROJECT DESCRIPTION		**VALUE**
Description:	Install CITECT SCADA system and associated field components and communications cabling and equipment to provide monitoring of underground conveyors, CO_2 early warning, mine ventilation flow, pressure and gas composition and supervision and control raw coal plant and washery	$300,000
Related Project(s):		$
START DATE: March 2009	**COMPLETION DATE**: September 2009	**EXPECTED LIFE**: 10 years

JUSTIFICATION/EVALUATION:

CURRENT STATUS: The mine washery is controlled by older generation CITEC system that provides local (in washery control room) control and monitoring with no effective data collection or trending available. Also no useful SCADA capability exists elsewhere at the mine.

EVALUATION: The mine will benefit from installing SCADA system capability to monitor and control the underground belt system, ventilation fans operation and power interlocking, ventilation flow and pressure, CO_2 monitoring for early warning of fire underground.

PROJECTED OUTCOMES: Once the CITECT system is installed and operating mine personnel will be able to access information relating to the day to day operating status this will provide immediate benefit to the mine by improved troubleshooting and recovery time from stoppages as well as provide alternate control access for the washery and will also provide useful plant and equipment energy use data that can be utilised to improve future energy use.

	Annual	Life Cycle
Cost Savings	$30,000	$300,000
Energy Savings	To be determined	
Greenhouse Gas Savings	To be determined	
Payback Period, NPV, IRR	10 Years,	

6. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

excel spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
				Yes
Project Type	*Sustaining*		*Enhancing*	
	Yes			

Other Benefits / Factors	*Productivity*	*Safety*	*Other*
	Yes	Yes	Yes, Improved monitoring and control will enhance productivity also assist in identifying process improvements and or energy savings

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

11.9 Appendix 9 - Install sub-metering

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION			
PROJECT: Install sub-metering			**DATE: Mar 2009**
PROJECT DESCRIPTION			**VALUE**
Description:	Supply and installation of energy meters for the washery and raw coal plant		$5000.00
Related Project(s):			$
START DATE: May 2009	**COMPLETION DATE**:	**EXPECTED LIFE**: 10 years	

JUSTIFICATION/EVALUATION:

CURRENT STATUS: The mine electrical energy is only metered at the 11kv supply points (NMI NEEE000978 main incoming supply for mining operations and NMI NEEE002166 alternate low capacity supply)

EVALUATION: By selectively installing metering in sub-circuits the mine will be able to gather useful energy use data. Locations for sub metering have been selected to obtain energy use data for the main areas of utilisation considering costs and accessibility.

No cost/ energy savings have been identified however the mine will be able to use the data collected to assess future energy use and opportunities for improvement.

PROJECTED OUTCOMES: By installing meters at the washery incoming supply and the raw coal plant supply the mine can obtain energy use data for the total coal handling and washery as well as the washery and raw coal plant. This will enable better energy use decisions in future.

	Annual	Life Cycle
Cost Savings	$	$
Energy Savings	MWh	MWh
Greenhouse Gas Savings	tonnes CO_2-e	tonnes CO_2-e
Payback Period, NPV, IRR	Years,	

7. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Not Applicable

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
	Yes			
Project Type	*Sustaining*		*Enhancing*	
			Yes	
Other Benefits / Factors	*Productivity*	*Safety*	*Other* Yes, Improved metering will assist in identifying energy saving opportunities.	

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

11.10 Appendix 10 – Reduce Idle Time Open Cut Machines

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION			
PROJECT: Reduce Idle Time Open Cut Machines			**DATE: Mar 2009**
PROJECT DESCRIPTION			**VALUE**
Description:	Review park up location and start up procedure to minimise unproductive running of trucks		$500.00
Related Project(s):			$
START DATE: Mar 2009	**COMPLETION DATE**: Mar 2009	**EXPECTED LIFE**: 10 years	

JUSTIFICATION/EVALUATION:

CURRENT STATUS: The existing truck park up location results in excess truck run time to and from the work face.

EVALUATION: By selecting a suitable location closer to the working face truck empty run time will be reduced resulting more time on production and fuel savings.

PROJECTED OUTCOMES: By relocating truck park up area there will be a reduction of 480 litres fuel use per week or 24,960 per year. This fuel saving results in 963GJ of energy being saved per year. This in turn provides a cost saving of $23,000

	Annual	Life Cycle
Cost Savings	$23,000	$230,000
Energy Savings	963GJ	9630GJ
Greenhouse Gas Savings	74 tonnes CO_2-e	740 tonnes CO_2-e
Payback Period, NPV, IRR	Years,	

8. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Attached spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
	Yes			
Project Type	*Sustaining*		*Enhancing*	
	Yes			
Other Benefits / Factors	*Productivity*	*Safety*		
	yes			

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

Appendix 10a Reduce Idle Time of Open Cut Machines Analysis

Production Equipment Reduced Idle Time	Value
Diesel fuel used per year (litres)	2315555
Fuel saved (480L/week)	24960
Diesel cost per litre ($)	0.92
Fuel cost saving ($)	$23,014
Reduced Truck run time	1.08%
Litre diesel to GJ	0.0386
Energy used (GJ)	89380
Reduction in energy use (GJ)	963
GJ saved per year	963
Total Estimated Cost Savings	$ 23,606.58
Diesel Energy Cost Savings	$ 23,013.72
Operating/ Maintenance Savings	$ 592.86
Capital Investment Cost	$ 500.00
Yearly operating/ Maintenance cost	$ 55,000.00
Avoided Capital Cost	$ -
Simple Payback	0.02

11.11 Appendix 11 – Turn Off Belts on Night shift

CHARBON COLLIERY ENERGY SAVING OPPORTUNITY EVALUATION			
PROJECT: Turn of belts on Night shift			**DATE: Mar 2009**
PROJECT DESCRIPTION			**VALUE**
Description:	Turn Belts of during night shifts when no production is carried out		$40,000
Related Project(s):			$
START DATE: Mar 2009	**COMPLETION DATE**: Mar 2009	**EXPECTED LIFE**: 5 years	

JUSTIFICATION/EVALUATION:

CURRENT STATUS: Until recently the ability to shut belts down and carry out the required inspections did not exist at the mine. Since an additional Deputy has been employed there is ample supervision and resources to do the statutory inspections after belt shutdowns

EVALUATION: Having the additional supervisory (deputy) resources now allows the mine to shut down belts when not required for production and or maintenance. This means saving about 3 - 8hour shifts running time per week.

PROJECTED OUTCOMES: By achieving approximately 24hours reduced belt run time the mine will save 425,777kWh per year. This electricity saving results in 1569GJ of energy being saved per year. This in turn provides a energy cost saving of $18,777 As well as estimated operating and maintenance cost savings of $120,000

	Annual	Life Cycle
Cost Savings	$139,000	$695,000
Energy Savings	1,569GJ	7,843GJ
Greenhouse Gas Savings	463 tonnes CO_2-e	2,315 tonnes CO_2-e
Payback Period, NPV, IRR	0.3 Years,	

9. ATTACHED DOCUMENTATION, QUOTES & ANALYSIS

Attached spreadsheet analysis

PROJECT SUMMARY:

Economic	*Low cost, cost effective measure*	*1-2 Year PB, seek Business Plan funding*	*3-4 Year PB, apply for ESF incentives*	*>4 Year payback*
	Yes			
Project Type	*Sustaining*		*Enhancing*	
	Yes			
Other Benefits / Factors	*Productivity*	*Safety*		
	yes			

JUSTIFICATION IS SUFFICIENT TO ENABLE BUSINESS DECISION?:	**Yes**
FURTHER ACTIONS REQUIRED:	

Appendix 11a Turn belts off on Nightshift

Shutdown Belts on Nightshift

Summary of Load reduction	Value
Average kW of existing belts	943
Estimated kWh (operating 3 shifts per day 5days per week)	2178887
Reduced kWh (from 15 to 12 shifts	1743110
kWh saved per year	435777
MWh saved per year	435.78
GJ saved per year	1568.80
kVA demand reduction	51
% peak operating hours (2pm-8pm)	18.56%
% shoulder operating hours	38.70%
% off peak operating hours 10pm-7am)	42.72%
Total Estimated Savings	$ 139,051.28
Energy Savings	$ 18,776.78
Maximum Demand Savings	$ 274.49
Operating/ Maintenance Savings	$ 120,000.00
Capital Investment Cost	$ 40,000.00
Yearly operating/ Maintenance cost	$ 600,000.00
Avoided Capital Cost	$ -
Simple Payback	0.29