

# Baralaba South Project – Decarbonisation Plan

Prepared for:

**Baralaba South Pty Ltd**

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## Glossary

<b>Term</b>	<b>Definition</b>
ha	Hectares
Mt	Million tonnes
tCO <sub>2</sub> -e	Tonnes carbon dioxide equivalent
<b>Nomenclature</b>	<b>Definition</b>
CH <sub>4</sub>	Methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> -e	carbon dioxide equivalents
<b>Abbreviation</b>	<b>Definition</b>
ACCUs	Australian Carbon Credit Units
ACARP	Australian Coal Industry Research Program
BCC	Baralaba Coal Company
CFI	Carbon Farming Initiative
CER	Clean Energy Regulator
CHPP	Coal handling and preparation plant
ETL	Electricity transmission line
EF	Emission factor
GHG	Greenhouse gases
KPI	Key performance indicators
LOM	Life of mine
Mtpa	Million tonnes per annum
MLA	Mining Lease Application
NEM	National electricity market
NGER	National Greenhouse and Energy Reporting
PPA	Power purchase agreement
PCI	Pulverised coal injection
QLD	Queensland
ROM	Run-of-mine
SOP	Standard Operating Procedures
TOR	Terms of reference
TLO	Train load-out
UNFCCC	United Nations Framework Convention on Climate Change

## EXECUTIVE SUMMARY

This document presents Baralaba Coal Company's (BCC) Decarbonisation Plan for the Baralaba South Project. The proponent for the Project is Baralaba South Pty Ltd (ACN 603 037 065) (formerly Mount Ramsay Coal Company Pty Ltd and Wonbindi TLO Holdings Pty Limited).

The proponent is a privately owned Australian metallurgical coal company; and a wholly owned subsidiary of Baralaba Coal Pty Ltd (Baralaba Coal Company). Baralaba Coal Pty Ltd is majority owned by the AMCI Group. The Plan meets the requirement of the Terms of Reference for environmental approval.

BCC's decarbonisation objective is to meet the Safeguards Mechanism emissions reduction targets against a production-adjusted baseline. It will do this through the following key result areas:

1. Mobile and stationary plant emissions are 10% less than projected in the base case by 2035
2. 50% to 100% of electricity needs are met through renewable electricity generation by 2035
3. Project staff are engaged in energy efficiency and emissions reduction
4. Integrate carbon farming with agricultural on land owned by BCC
5. New technologies and processes are evaluated for cost-effective emissions reduction.

Potential actions for decarbonisation include, if practicable:

- Optimisation of vehicles and processes for energy efficiency
- Optimising loading, transit, and unloading areas for energy efficiency
- Purchase of renewable electricity
- Integration of renewable electricity generation and agriculture (agrivoltaics) on BCC land
- Production of biochar from cleared vegetation
- Participation in carbon farming initiative on BCC land

BCC commits to a process of continuous improvement informed by engaged staff, monitoring, and research and development.

The Baralaba South Project will help the Queensland Government achieve the state's targets for renewable energy generation and emissions reduction by purchasing renewable electricity, enabling production of renewable energy on land owned by BCC where economically feasible, participating in carbon sequestration activities on land owned by BCC where practicable, and being an active participant in progressive Safeguards Mechanism emissions reductions.

# 1. INTRODUCTION

This document provides Baralaba Coal Company’s (BCC) Decarbonisation Plan for the proposed extension of the Baralaba South Project (the Project) (Figure 1) in support of its application for environmental approval through an Environmental Impact Statement. It will also cover decarbonisation of the existing Baralaba Mine. The proponent for the Project is Baralaba South Pty Ltd (ACN 603 037 065) (formerly Mount Ramsay Coal Company Pty Ltd and Wonbindi TLO Holdings Pty Limited).

The Queensland Government has recently updated the generic terms of reference (ESR/2020/5294, version 1.02) (TOR) for environmental approvals and environmental impact statements to include the development of a decarbonisation plan that identifies, inter alia, how a project will contribute towards Queensland’s emissions reduction and renewable energy targets (Table 1). Currently there are no decarbonisation requirements in the Project TOR (Loveday, 2017); the present Decarbonisation Plan is a voluntary action taken by BCC.

The Project is a greenfield, open-cut metallurgical coal mine that would extract up to 2.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal to produce pulverised coal injection (PCI) coal predominantly for international export to the steel production industry, along with minor domestic sales.

The Project will provide a continuation of mining operations within the local area, wherein mining operations decline at the Baralaba North Mine and mining operations ramp up in the Project area.

**Table 1 Sections of Decarbonisation Plan addressing the generic ToR**

Terms of Reference	Section
a. Quantify, describe, and illustrate the project’s contribution toward Queensland’s emissions reduction and renewable energy targets: <ul style="list-style-type: none"> <li>i. 30% on 2005 levels by 2030</li> <li>ii. 50% renewable energy by 2030</li> <li>iii. zero net emissions economy by 2050.</li> </ul>	Section 3, Table 2, Table 3
b. Explain feasible alternatives that were considered to avoid or reduce the project’s emissions as well as the alternative of not proceeding with the proposed project.	Section 2.2
c. Describe: <ul style="list-style-type: none"> <li>i. Measures (preferred and alternatives) proposed to avoid and/or minimise Scope 1 and Scope 2 GHG emissions of the proposed project</li> <li>ii. Options for avoiding and/or mitigating Scope 3 emissions.</li> </ul>	Section 3, Table 2, Table 3
d. Include: <ul style="list-style-type: none"> <li>i. Opportunities to reduce greenhouse emissions through renewable energy use and innovation</li> <li>ii. Any voluntary initiatives, such as research into reducing the lifecycle and embodied energy carbon intensity of the proposed project’s processes or products</li> </ul>	Section 3.2, Table 2

Terms of Reference	Section
<ul style="list-style-type: none"> <li>iii. Any additional carbon offsetting options for emissions that cannot be reduced (including, but not limited to, through carbon offsets, vegetation management).</li> </ul>	
<ul style="list-style-type: none"> <li>e. Quantify the emissions expected to be abated for each avoidance and mitigation measure.</li> </ul>	Table 3
<ul style="list-style-type: none"> <li>f. Compare preferred measures for emission controls and energy consumption with best practice International environmental management in the relevant industry sector.</li> </ul>	Section 3.4
<ul style="list-style-type: none"> <li>g. Describe the practicality, effectiveness and risks for each avoidance and mitigation measure.</li> </ul>	Section 3.4
<ul style="list-style-type: none"> <li>h. Demonstrate that measures have been factored into the economic feasibility of the project.</li> </ul>	Section 3.4
<ul style="list-style-type: none"> <li>i. Describe and commit to: <ul style="list-style-type: none"> <li>i. Periodic energy audits that measure progress towards improving energy efficiency</li> <li>ii. A process for regularly reviewing new technologies to identify opportunities to further reduce GHG emissions and use energy efficiently, consistent with best practice environmental management</li> <li>iii. Monitoring, auditing and transparent public reporting on: GHG emissions from all relevant activities; the success of mitigation measures; and, the project's contribution to achieving Queensland's 2030 target and achieving net zero by 2050</li> <li>iv. Ongoing training and capacity building around decarbonisation options, technology and reporting.</li> </ul> </li> </ul>	Section 3.5



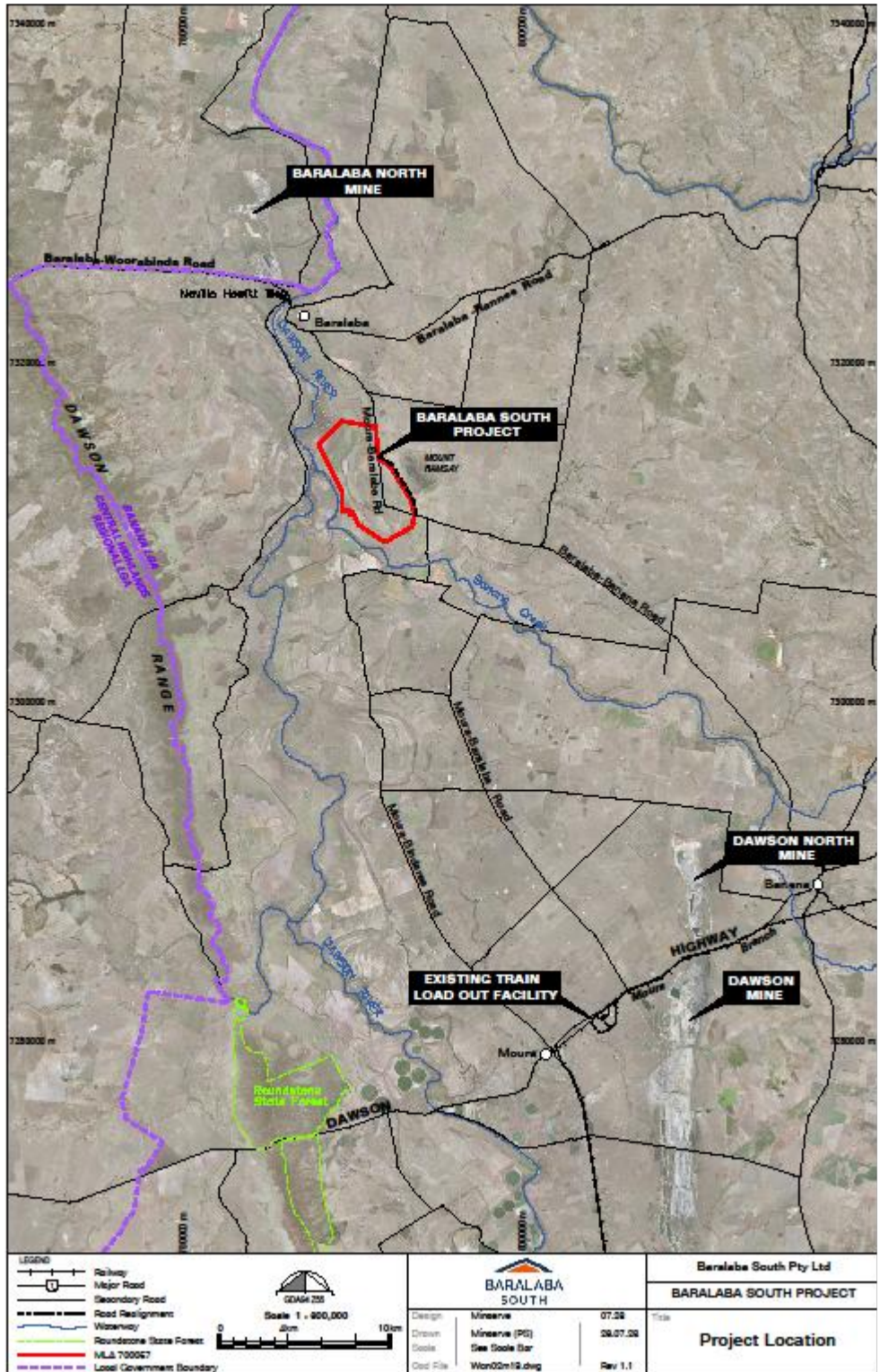


Figure 1 Location of the Baralaba South Project



## 2. THE PROJECT

### 2.1 Overview

The Project is a greenfield metallurgical open-cut coal mine development approximately 8 kilometres (km) south of Baralaba (Figure 1) in the lower Bowen Basin, Queensland. The Project objective is to develop the coal resource for export of a low-volatile pulverised coal injection (PCI) product for the steel industry

The Project targets the Baralaba Coal Measures, including the basal sub-unit Kaloola Member, where the structural dip of the Permian geology brings them to or near the surface. The total resource targeted comprises approximately 49 million tonnes (Mt) of ROM coal, which is projected to produce approximately 36 Mt of PCI product coal over the 23-year life of the Project. The maximum coal production limit of the company's Infrastructure Approvals, which currently stand at 3.5 Mtpa, will be obtained from either or both Baralaba North mine and Baralaba South mine in any one year. Maximum combined production forecasts are at 2.5 Mtpa in 2030 and remain well under the Infrastructure Approvals limit.

Mining activities (Section 2.3) will occur within the 2,214 hectares (ha) of Mining Lease Application (MLA) 700057. A coal handling and preparation plant (CHPP) will be established on site and the PCI will be transported on road trains via the existing Baralaba North Mine haul route, approximately 40 km by public road south to the existing train load-out (TLO) facility east of Moura. Most of the product coal would then be transported by rail to the Port of Gladstone for export to international markets.

Excavated overburden and interburden will be disposed of in out-of-pit spoil dumps located contiguous with the pit excavation, and in-pit dumps as part of ongoing progressive rehabilitation behind the advancing operations. All land disturbed by mining activities will be rehabilitated to achieve the post-mining land use.

The Project will also involve realignment of the Moura Baralaba Road and construction of an 8 km long electricity transmission line (ETL) within a 20 m wide easement to connect the Project with the Baralaba Substation.

### 2.2 Alternative considered

The original Baralaba South plan was for 5 Mtpa of product coal with a disturbance area of just under 2,231 ha. This has been reduced to the current proposed production rate of 2.5 Mtpa with a disturbance area (including buffer zone) of 1,279 ha. Consequently, total Scope 1 emissions will be significantly less than would have occurred under the original plan.

### 2.3 Project Activities

The Project is based on conventional truck and excavator terrace mining operations. The main activities associated with the Project include:

- Removal and stockpiling of topsoil for future rehabilitation
- Drilling and blasting of overburden
- Removal of overburden and stockpiling in out-of-pit and in-pit dumps for future in filling
- Excavation of exposed coal and loading onto haul trucks
- Transport to and unloading at the CHPP
- Washing and pulverisation of coal at CHPP
- Loading of PCI product coal onto trucks and transporting to TLO point near Moura.

Other activities will include construction and operation of infrastructure, realignment of the Moura Baralaba Road, and construction of the ETL.

### 3. DECARBONISATION PLAN

#### 3.1 Goal

BCC’s goal is to have an energy efficient mining operation that enables progressive emissions reduction in line with Queensland’s emissions reduction targets of net zero by 2050.

#### 3.2 Objective, Key Results, and Actions

BCC’s objective is to meet the Safeguards Mechanism emissions reduction targets against a production-adjusted baseline (Table 2). Under the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015, the Clean Energy Regulator (CER) is required to publish information relating to emissions reduction targets and emissions baseline determinations (baselines) as part of the Safeguards Mechanism. The current emissions target is a 4.9% per annum reduction until 2030, with subsequent emissions targets to be published as determined.

The existing Baralaba Coal Mine is covered under the Safeguard Mechanism but does not yet have an annual production-adjusted baseline. BCC currently relies on the purchase of Australian Carbon Credit Units (ACCUs) to offset its emissions.

**Table 2 Objective, Key Results, and Management Controls**

<b>Objective: To meet the Safeguards Mechanism emissions reduction target of 4.9% per annum to 2030, and as later determined, against the production-adjusted baseline</b>	
<b>Key Results</b>	<b>Management Controls</b>
<b>Key result 1: Mobile and stationary plant emissions are 10% less than projected in the base case by 2035</b>	<ul style="list-style-type: none"> <li>• Procure or contract for heavy vehicles with best diesel use efficiency rating</li> <li>• Optimise mine layout and run of mine for diesel use efficiency</li> <li>• Conduct real time monitoring and control of diesel use efficiency</li> <li>• Shift to premium diesel or biodiesel if available and cost effective</li> <li>• Investigate and implement new technologies for increased diesel use efficiency if practicable and cost-effective, including fully electric options and/or alternative fuel sources such as hydrogen</li> </ul>
<b>Key result 2: 50% to 100% of electricity needs are met through renewable electricity generation by 2035</b>	<ul style="list-style-type: none"> <li>• Contract a power purchase agreement (PPA) for renewably generated electricity where cost effective</li> <li>• Establish renewable electricity generation on land owned by BCC if cost effective</li> </ul>
<b>Key result 3: Project staff are engaged in energy efficiency and emissions reduction</b>	<ul style="list-style-type: none"> <li>• Energy efficiency and emissions reduction are tied to management and executive KPIs</li> </ul>

	<ul style="list-style-type: none"> <li>• National Greenhouse and Energy Reporting (NGER) assessments and audits are linked to management and executive KPIs and efficiency/emissions programs</li> <li>• Standard Operating Procedures (SOP) are established for energy efficiency and emissions reduction</li> <li>• Staff are trained in SOPs for energy efficiency and emissions reduction</li> </ul>
<b>Key Result 4: Integrate carbon farming with agricultural on land owned by BCC</b>	<ul style="list-style-type: none"> <li>• Identify best management practices to increase the carbon stock in soil and vegetation</li> <li>• Implement a Carbon Farming Initiative (CFI) project if appropriate</li> </ul>
<b>Key result 5: New technologies and processes are evaluated for cost-effective emissions reduction or abatement</b>	<ul style="list-style-type: none"> <li>• Scope and evaluate new technologies and processes</li> <li>• Consider cost effectiveness and return on investment in decision making</li> </ul>

### 3.3 Projected GHG Emissions

There are three direct sources of GHG emissions (Scope 1 emissions) and one indirect source of GHG emissions (Scope 2 emissions). These are vegetation clearance, fugitive methane released from the excavated coal seams, and diesel combusted during mining activities (Scope 1) and the production of electricity purchased from the national electricity market (NEM) (Scope 2) (Trinity Consultants Australia, 2023).

Diesel combustion for all mining, transportation, and site electricity provision, is projected to be the largest source of GHG emissions, with combustion for stationary energy purposes the largest fraction of this at 1,915.5 kt CO<sub>2</sub>-e for the life of mine (LOM, 30 years including 23 years operational and 7 years rehabilitation) (Table 3). Fugitive methane released from exposed coal seams is projected to be 1,507 kt CO<sub>2</sub>-e for the operational LOM (23 years) based on the current emission factor for open cut coal mines (Table 3). Vegetation clearance is projected to result in 12.6 ktCO<sub>2</sub>-e with revegetation accounting for 20.64 ktCO<sub>2</sub>-e of atmospheric carbon sequestration over 50 years.

Electricity purchased from the national electricity market (NEM) accounts for 25.8 kt CO<sub>2</sub>-e Scope 2 emissions per annum at the current Queensland emissions factor. This emissions factor will reduce as a greater amount of renewable generation comes online and coal fired electricity generation reduces. Consequently, the LOM Scope 2 emissions will be less than projected (Table 3) under current expected electricity demand. Purchasing (or producing) renewable electricity will incur 0% GHG emissions for the proportion purchased or produced.

Scope 3 emissions from the combustion of the product coal are not considered here. However, BCC notes that all its current customers are in countries that have signed up to the Paris Agreement on Climate Change and are required to reduce their GHG emissions to reach the goals of the Paris Agreement.

**Table 3 Sources and quantities of GHG emissions (kt CO<sub>2</sub>-e) by activity for LOM (including rehabilitation) and mitigated emissions by 2035**

Activity	Base Case Maximum Life of Mine Emissions (kt CO <sub>2</sub> -e)	Base Case Emissions (kt CO <sub>2</sub> -e) by 2035	Mitigated Emissions (kt CO <sub>2</sub> -e) by 2035
Stationary mining and TLO plant <sup>1</sup> diesel combustion	1,915.50	524.40	471.96
Fugitive methane <sup>2</sup>	1,507.00	301.00	301.00
Purchased electricity <sup>3</sup>	592.00 <sup>4</sup>	129.00	64.50 / 0
Light vehicle diesel combustion	38.00	8.60	7.74
Heavy vehicle diesel combustion <sup>5</sup>	63.00	12.60	11.34
Vegetation clearance	105.00	14.30	14.30
Revegetation <sup>6</sup>	-172.00	-5.20	-5.20
<b>Total</b>	<b>4,045.50</b>	<b>984.70</b>	<b>865.64 / 801.14</b>

### 3.4 Management Controls to Reduce GHG Emissions

The following management controls will be applied by the BCC where practicable and cost-effective to achieve the objective and key result areas (Table 2).

#### Key result 1:

BCC will apply best practice and design loading, transit, and unloading areas to minimise unnecessary slowing or stopping of heavy trucks and optimise operational efficiency (Crittenden *et al.*, 2016). This will include:

- Planning and scheduling to minimise material handling and double handling
- Optimising payload
- Minimising the slope of haul roads
- Minimising rolling resistance.

<sup>1</sup> Includes onsite mobile plant not registered for road use, e.g., excavators and haul trucks, and stationary engines, e.g., generators

<sup>2</sup> Over 23-year life of operating mine

<sup>3</sup> Mitigation is 50% renewable or 100% renewable

<sup>4</sup> The actual emissions will be less than this as the emissions factor will reduce over time. 100% renewable electricity will incur zero (0) emissions

<sup>5</sup> On road transport of PCI from CHPP to railhead for 23 years

<sup>6</sup> Over 50 years

Mining activities will be undertaken by contractors; however, BCC is responsible for the emissions of these contractors under the NGER Act. Consequently, BCC will require contractors and plant suppliers to meet diesel use efficiency measures, which may include:

- Use of most fuel-efficient vehicles or plant, including alternative drive trains, e.g., diesel-electric hybrids or battery electric vehicles.
- Engine, gearing, and/or timing controls for efficiency
- Training in efficient operation/driving and monitoring of operator/driver behaviour
- Use of premium diesel or biodiesel if available
- Automation where practicable.

**Key Result 2:**

BCC will evaluate the cost-effectiveness of engaging in a Power Purchase Agreement (PPA) with a supplier of renewably generated electricity for use by the Baralaba South Coal Mine. This would both support investment in renewably generated electricity in Queensland, helping to meet Queensland targets for renewable energy, and provide for significantly reduced Scope 2 emissions for the mine.

BCC will also evaluate whether Agrivoltaic farming, i.e., the simultaneous use of land for producing photovoltaic electricity and farming, on land owned by the company could be a positive investment and investigate options for making this happen. This management control would also contribute to meeting Queensland's renewable energy generation targets if implemented.

**Key Result 3:**

BCC is committed to having a workforce that understands the importance of energy efficiency and emissions reduction to the success of the company and will implement key performance indicators (KPI) at the appropriate levels of management and training of staff to ensure that management controls are implemented and monitored. BCC will incorporate energy efficiency in standard operating procedures and will promote a process of constant improvement.

**Key Result 4:**

The Carbon Farming Initiative (CFI) is a voluntary carbon offsets scheme that allows land managers to earn carbon credits by changing land use or management practices to store carbon or reduce greenhouse gas emissions. BCC will investigate and identify best management practices to increase the carbon stock in soil and vegetation in land owned by the company and will implement a CFI project if appropriate. Options such as the production of biochar from locally grown biomass and wood waste and sequestration of this in soil will be investigated.

BCC will also consider whether rehabilitation activities on the mine site can be optimised for added carbon sequestration.

**Key Result 5:**

BCC is committed to a process of continuous improvement to meet its decarbonisation goal and objective. It will scope for new technologies and processes that may be implemented cost-effectively to improve efficiency and reduce GHG emissions. BCC will also continue to support the Australian Coal Industry Research Program (ACARP) in research to develop best practice environmental management measures.

### Fugitive methane:

It is technically possible to pre-drain coal seam gas ahead of open cut mining where coal seams are thick enough and where gas pressure and methane content makes it practical to extract the gas and flare it or use it for electricity generation (DNRME, 2019; UNECE 2016, 2021). The Baralaba South Project seams are fractured which means that gas drainage and harvesting is unlikely to be practicable. However, BCC will continue to investigate management control options for fugitive methane abatement and implement them if practicable.

## 3.5 Monitoring and Evaluation

Energy efficiency and emissions reduction will be a KPI of senior BCC management and executives. Consequently, the success of management controls identified in Table 2 will be periodically audited and reviewed.

BCC is subject to annual NGER reporting of its Scope 1 and Scope 2 emissions, including for Safeguards Mechanism purposes, and will be required to demonstrate year-on-year proportional reduction in emissions relative to its production-adjusted baseline.

BCC will report its progress in emissions reduction and minimisation of Safeguards Mechanism liabilities to the company Board and will also report its progress in emissions reduction in the Sustainability section of its website.

## 3.6 Offsetting Residual Emissions

BCC recognises that proportional emissions reduction against the production-adjusted baseline is unlikely to be a linear process so may be required to purchase Australian Carbon Credit Units (ACCU) in some years to offset exceedances. Conversely, in other years, a step change in emissions reduction may result in bankable ACCU that can be used to offset exceedances in future years.

BCC will consider options for voluntary carbon offsets on agricultural land owned by the company, including participating in the CFI if appropriate.

## 3.7 Contribution to Queensland's Emissions Reduction and Renewable Energy Targets

Queensland has committed to three emissions reduction and renewable energy targets. The targets are:

- i. 30% reduction in GHG emissions on 2005 levels (to 138.1 MtCO<sub>2</sub>-e) by 2030
- ii. 50% of energy will be provided by renewable energy sources by 2030 (70% by 2032)
- iii. A zero net emissions economy will be achieved by 2050.

Companies such as BCC are expected to demonstrate how their activities will contribute to Queensland achieving these targets when seeking environmental approval.

**Table 4 Project Contribution to Queensland's emissions and renewable energy targets**

Queensland Targets	Project Contribution
<b>30% on 2005 levels by 2030</b>	N/A. Operations will not commence until 2030.
<b>50% renewable energy by 2030</b>	Making land owned by BCC available for agrivoltaics
<b>Zero net emissions economy by 2050</b>	Progressive reduction in production-adjusted baseline emissions under Safeguards Mechanism Purchase of 50% to 100% renewable electricity through a PPA

## 4. SUMMARY

This document presents Baralaba Coal Company's (BCC) Decarbonisation Plan for the Baralaba South Project. The Plan meets the requirement of the Terms of Reference for environmental approval.

BCC's decarbonisation objective is to meet the Safeguards Mechanism emissions reduction targets against a production-adjusted baseline. It will do this through the following key result areas:

1. Mobile and stationary plant emissions are 10% less than projected in the base case by 2035
2. 50 to 100% of electricity needs are met through renewable electricity generation by 2035
3. Project staff are engaged in energy efficiency and emissions reduction
4. Integrate carbon farming with agricultural on land owned by BCC
5. New technologies and processes are evaluated for cost-effective emissions reduction.

Potential actions for decarbonisation include, if practicable:

- Optimisation of vehicles and processes for energy efficiency
- Optimising loading, transit, and unloading areas for energy efficiency
- Purchase of renewable electricity
- Integration of renewable electricity generation and agriculture (agrivoltaics) on BCC land
- Production of biochar from cleared vegetation
- Participation in carbon farming initiative on BCC land.

BCC commits to a process of continuous improvement informed by engaged staff, monitoring, and research and development.

The Baralaba South Project will help the Queensland Government achieve the state's targets for renewable energy generation and emissions reduction by purchasing renewable electricity, enabling production of renewable energy on land owned by BCC where feasible, participating in carbon sequestration activities on land owned by BCC where practicable, and being an active participant in progressive Safeguards Mechanism emissions reductions.



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