Ecosystem-as-a-Service
Erosion monitoring

RGB Drone Data

Digital Elevation Model
Biodiversity Area Classification

RGB Drone Data

Automated Area Classification;
% BTWIG Area Cover Trend Analysis
OC1 Planting Plan 2019

Area: 7.88 ha
Perimeter: 1298.59 m
Avg. Rainfall: 641 (mm/yr)
Climate: Temperate, no dry season (hot summer)
# Planting Plan

## Planting Parameters

<table>
<thead>
<tr>
<th>Number of hectares</th>
<th>Desired number of trees per hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.9</td>
<td>1000</td>
</tr>
</tbody>
</table>

## Operation Estimates

<table>
<thead>
<tr>
<th>Operational Days On Site</th>
<th>Total Operation Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.0</td>
</tr>
</tbody>
</table>

## Planting Window

<table>
<thead>
<tr>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
</table>

## Species Selection

<table>
<thead>
<tr>
<th>Species</th>
<th>Name</th>
<th>Survival (%)</th>
<th>Seeds / KG</th>
<th>Seed Viability</th>
<th>Ratio</th>
<th>KG / Ha</th>
<th>KG Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔️ Eucalyptus blakelyi</td>
<td>Blakely’s Red Gum</td>
<td>0.088</td>
<td>4921000</td>
<td>0.87</td>
<td>1</td>
<td>0.05</td>
<td>0.4</td>
</tr>
<tr>
<td>✔️ Dodonaea viscosa ssp. cuneata</td>
<td>Wedge-leaf Hop-Bush</td>
<td>0.092</td>
<td>204000</td>
<td>0.94</td>
<td>1</td>
<td>1.13</td>
<td>8.9</td>
</tr>
<tr>
<td>✔️ Acacia decora</td>
<td>Western Silver Wattle</td>
<td>0.092</td>
<td>97000</td>
<td>0.83</td>
<td>1</td>
<td>2.70</td>
<td>21.3</td>
</tr>
<tr>
<td>✔️ Allocasuarina verticillata</td>
<td>Drooping Sheoak</td>
<td>0.024</td>
<td>250000</td>
<td>0.86</td>
<td>1</td>
<td>3.88</td>
<td>30.5</td>
</tr>
<tr>
<td>✔️ Angophora floribunda</td>
<td>Rough-Barked Anig</td>
<td>0.607</td>
<td>135000</td>
<td>0.8</td>
<td>1</td>
<td>0.31</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Seed spreading planning shapefiles on BioCarbon SK.AI platform; Shapefile translated into automated seeding drone flightpath

Geo-tagging: Actual Flight Path over tailings dam (22 Ha Area)
Where are we today, and where are we going?

Tech = Tick
Market = Tick
Scale = Next

Projects & Partners
INTELLIGENCE DRIVES EFFECTIVE RESTORATION

Analytics and Actuation
BioCarbon provides a two sided platform to inform decisions and enable customers to act on them.
SK.AI

Ecosystem Insights

Actuation

BioCarbon Data

Other Datasets
GROWING MARKET WITH INCREASING COSTS

MINING

- **US$430 m market**
  (only planting and data)

- **105,000 Ha Rehab / Yr**
  (Coal, bauxite, iron ore)

- **500 target mines**
  In Australia, Europe, Canada, USA

- **Highly regulated**

OIL AND GAS

- **US$250 bn market**

- **10bn Tonnes CO₂ emitted**
  (2017 emissions)

- **Increasing global offset commitments**

- **US$25/tonne Carbon price**
  ($5 - $139)
ECOSYSTEM RESTORATION MARKET DRIVERS

Investment in ecosystem restoration is set to grow by 700% by 2030¹.

Mining Drivers:
- Mining regulations
- Safety
- Data for post mining land relinquishment

Oil & Gas Drivers:
- Compliance carbon offsets
- Social license to operate and voluntary offsets

Global Commitment Drivers:
- Weather variability (risk)
- Land productivity
- Biodiversity loss

¹ Source: Crédit Suisse & McKinsey
CASE STUDY: COAL MINING

MOOLARBEN COAL

YANCOAL

BioCarbon Engineering
CASE STUDY: MINING CHALLENGES

CHALLENGE 1
Land for mining rehab and restoration activities are typically:
- difficult to access
- too steep or rugged for land machinery
- dangerous for manual operators.

CHALLENGE 2
Regulators require data on restoration progress over time which is currently collected manually.
CASE STUDY: MOOLARBEN

Moolarben mine is 1 of 10 Yancoal coal mines. BioCarbon uses this case study to open doors to sales at other mining companies.

“"The use of this highly innovative and industry leading technology will assist Moolarben in meeting our commitments to mine site rehabilitation”

AUTUMN 2017
A$6,000
Mapping + Seeding

SPRING 2017
A$44,000
+ Precision pods

SPRING 2018
A$76,000
+ Fertilizer Spreading
+ Weed spraying
CASE STUDY: VALUE

**SOLUTION**: BioCarbon Engineering solved a key issue of the labour intensive and limited scale monitoring by providing drone data analytics services to classify the mine rehabilitation for regulatory submission.

Based on this, the mine is resubmitting regulatory approvals documents to integrate BioCarbon’s systems, saving them up to $500k each year.

Additionally, the customer featured BioCarbon’s natural pattern programming for seed spreading and targeted fertilizer application in a presentation at a mining conference that they held. This project planning tool reduced planning time from days to minutes.

Estimated BCE contracts for the Moolarben site in 2019 are at $200,000.
LAYERS OF VALUE TO OUR CUSTOMERS

- SYSTEMS & HARDWARE TO RESTORE @ SCALE
- NETWORK TO CONNECT
- BIG DATA TO PLAN
- BIG DATA TO REPORT - CARBON
- PMOS WITH FINANCE
- ABILITY TO ACT @ SCALE
- ATTRACT FINANCE
- BIG DATA TO REPORT - BIODIVERSITY
$250,000 secured for 250 Ha Myanmar project; 38 inbound qualified leads in sales pipeline or $2.5m on discount basis.

Oct 2017
$250,000 secured for 250 Ha Myanmar project; 38 inbound qualified leads in sales pipeline or $2.5m on discount basis.

June 2013
Feasibility analysis started.

Aug 2014
BCE incorporated; Provisional patent filed.

April - July 2015
Mapping UAV tested; 3,000 Ha mapped in South Africa/UK; First planting trials completed; up to 75% germination rates.

July - December 2016
Commercial UAV licences secured in UK & Australia; Waterproof UAV completed; 9 FT Employees & 1 PT.

October 2017
$2.5m seed extension funding round closed; 1st inbound Oil and Gas carbon offset enquiries.

April 2018
$2.5m seed extension funding round closed; 1st inbound Oil and Gas carbon offset enquiries.

October 2018
Sales expansion from 1 to 5 mines, with multiple sites per company; Convertible note fundraising to be secured.

February 2014
Founding team joins.

January 2015
Planting UAV prototype completed, tested & proven; Seed pod designs completed.

December 2015
$1.15m seed funding secured.
2 FT Employees & 4 PT.

March 2017
Full national phase patent applications filed; 2nd (out of >800) at International Drones for Good Award, 1% behind Nokia.

March 2018
Launched alpha version of SKAI with project planning tool and data storage capability.

September 2018
Capability expansion to include swarm operations; fertilizer spreading; weed detection and herbicide spraying. 14 FT Employees + 3 FT Interns.
BioCarbon has demonstrated value across automated planting through accelerated speed, decreased soil compaction, and improved safety. BioCarbon addresses the hole in the market: where everyone else is focused on monocropping agriculture, we focus on complex ecosystems. We are leaders in ecosystem analytics. Site managers spend enormous amounts of time planning projects. Our automated planning tool reduces planning time by a factor of 10.

BioCarbon is building systems that bring together stakeholders from finance, project management and contract services.

As the carbon market seeks reliable carbon offset projects, BioCarbon is building the database and methods required to provide a new standard for carbon verification.

To achieve the vision of global scale ecosystem restoration, BioCarbon is providing to specific ecosystems while building capabilities for the world.
Biodiversity
Vision

Product

Market
Customer Journey

1. Data
2. Planting
3. Land Preparation & Maintenance

Ecosystem Restoration

- Monitoring
- Data Collection
- Data Analysis
- Project Planning
- Land Preparation
- Planting
- Maintenance