# Helping miners manage energy risk with data

Carbon Compass

# Problem

## Energy headwinds are making it harder for miners to operate business as usual.

**10%**
of Australia's GDP & Emissions

**30%**
energy share of total operating costs

**6%**
rise (p.a.) in energy consumption & intensity

**ENERGY HEADWINDS:**

1. Issues with energy reliability
2. Rising fuel prices
3. Increasing energy intensity of operations

# These energy headwinds make it harder for miners to achieve their core goals

| | Headwind 1<br>**Energy reliability** | Headwind 2<br>**Energy prices** | Headwind 3<br>**Energy intensity** |
|---|---|---|---|
| | *50M AUD loss per day from disruptions* | *Predicted increase of >100% for next 4 years* | *28.8% lower ore grade, leads to 46% energy increase* |
| | **Impact of power disruptions** | **Impact of rising prices** | **Impact of rising intensity** |
| *Financial* | ✖ | ✖ | ✖ |
| *Operational* | ✖ | ✖ | ✖ |
| *Environmental* | | | ✖ |

# There are solutions to address these headwinds but there are also barriers to adoption

| | | | |
|---|---|---|---|
| **Headwinds** | **Lack of energy reliability** | **Rising Energy Prices** | **Rising Energy Intensity** |
| **Solutions** | Long term PPAs/ Renewables | Renewables/ Process optimization | |
| **Barriers** | Insufficient data to negotiate better PPAs and make informed decisions around renewables. | Insufficient data to make decisions around planning & scenario modelling before adoption/implementation | |

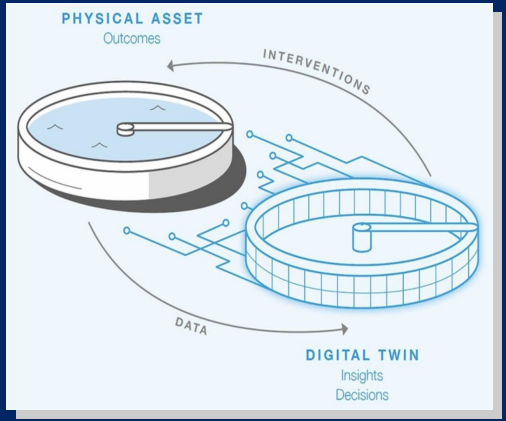
# We can remove these barriers by leveraging the key asset all mines possess: *Data*

| | | | |
|---|---|---|---|
| **Headwinds** | **Lack of energy reliability** | **Rising Energy Prices** | **Rising Energy Intensity** |
| **Solutions** | Long term PPAs/ Renewables | Renewables/ Process optimization | |
| **Barriers** | Insufficient data to negotiate better PPAs and make informed decisions around renewables. | Insufficient data to make decisions around planning & scenario modelling before adoption/implementation | |
| **Data** | Identify baseline of current energy stack, impact of volatile fuel prices, model benefits of adjusting energy stack and/or adopting renewables | | |

# Our solution

**We are developing a digital twin solution** that leverages data to help Tier 2 and 3 off-grid mineral and metal miners

1. optimize their energy stack and
2. *reduce the risks* to their financial, operational and environmental goals.




## Value provided:

1. Manage energy price volatility
2. Manage disruption risks
3. Manage carbon emissions
4. Build a data-driven case for renewables
5. Future-proof your business

# How it works

- **Potential use case:** Monitor and model impact of fuel price volatility on profitability
- **Energy stack:** Diesel gensets

**Stage 1**

**Establish baseline**
by inputting KPIs on productivity, budget, emissions goals & energy spend

**Stage 2**

**Model Scenarios**
Identify 1) real-time impact on profitability and emissions and 2). model probability and risks of rising/falling fuel prices

**Stage 3**

**Evaluate best solutions**
To mitigate this risk by modeling opportunities to either adjust genset use or use derivatives to hedge exposure

**Stage 4**

**Share actionable insights**
With other key stakeholders to gain consensus and take action to mitigate risk

## Our approach to digital twins

**Non Invasive**
Creating a twin without stopping operations by using non invasive tech,

**Contextualized Insights**
Data and insights are contextualised to KPIs in collaborative process

## Value delivered:

**Profitability**
Identify potential risks to financial goals due to price volatility ahead of time

**Footprint**
Identify impact of falling fuel prices and mitigative actions on environmental goals

# Unlocking value with data

| Risks | Potential use case | Value | | |
|---|---|---|---|---|
| | | Financial | Operational | Environmental |
| **Energy price volatility** | Model & monitor impact that volatile fossil fuel prices and dynamic market conditions have on productivity and budget | ● | ● | |
| | Simulate scenarios to optimize usage of gensets to address rising prices | ● | ● | |
| | Simulate potential outcomes of using derivatives to hedge against fossil fuel price volatility | ● | ● | |
| **Cost of renewables adoption** | LCOE of current energy stack vs optimized energy stack and compare different financing options (e.g: corporate PPA or Equity stake) | ● | ● | ● |
| **Carbon emissions** | Scenarios to enhance current energy stack with renewable assets, and implications of these on productivity and environmental goals | | ● | ● |

# Build the future with us

## 1 Proof of concept

Collaborate with us on a risk free proof-of-concept.

## 2 Product demonstration

View a demonstration of an early prototype to start ideating on potential use cases.

## 3 Free trial

Pen your name down for a free trial of solution and secure early-adopter rates.

# Appendix

# List of potential use cases

| Risks | Opportunities to monitor and model: |
|---|---|
| **Energy price volatility** | • impact volatile fossil fuel prices and dynamic market conditions have on productivity and budget<br>• scenarios to optimize usage of gensets to address rising prices<br>• potential outcomes of using derivatives to hedge against fossil fuel price volatility |
| **Disruption risk** | • impact of climate related risks<br>• intermittency risk of renewable assets |
| **Carbon emissions** | • scenarios to optimize current energy stack to reduce emissions and impact on productivity and budget<br>• scenarios to enhance current energy stack with renewable assets, and implications of these on productivity and environmental goals |
| **Cost of renewables adoption** | • LCOE of current energy stack vs optimized energy stack and compare different financing options (e.g: corporate PPA or Equity stake) |
| **Rising energy intensity** | • above options for multiple sites at the same time to identity overall impact on organization<br>• performance of hybrid assets to assess performance against desired goals and for continued improvement |