

# SOLAR & BATTERY STORAGE POWER PROJECT CAN ALSO INCLUDE THERMAL UNITS

- Vivo Energy fully responsible for project
  - 100% equity funded
- Zero Capital outlay for the mine
- Mine only pays once electrons are delivered
- Mine can terminate Vivo PPA after agreed period without penalty
- Opportunity for mine to own the asset after agreed period
- Project benefits from Vivo's in-country expertise



Our Vivo PPA is designed to supply highly reliable electricity and energy solutions to a mine through a bespoke Power Purchase Agreement, in conjunction with a Vivo Energy Fuels & Lubricants contract.



# **VIVO ENERGY PRELIMINARY REQUIREMENTS**



# Vivo reduces a mine's AICP & displaces 1000's of tonnes of CO<sub>2</sub>



Peak Load



Agreed 365/24/7



[ ]MW Generators: Diesel/HFO



] \$/I Cost of Fuel



Consumption of Fuel



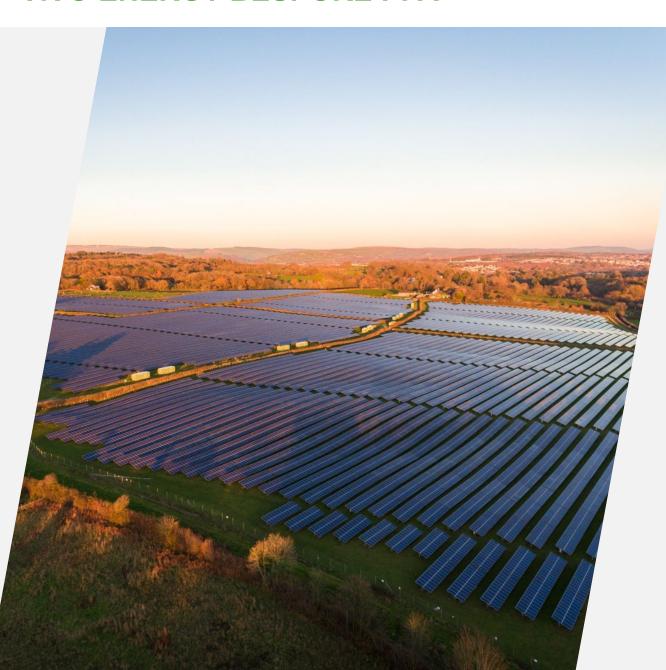
Connection Point and location of Solar Project

# **Vivo Objective**

- Reduce the mine's AICP
- Achieve a 30% to 50% reduction in CO<sub>2</sub> emissions from mine's thermal plant
- Provide a Vivo PPA Thermal Power Solar Battery Power Competitive Pricing Zero Escalation through life of the PPA
- Rapid, simple execution of the project Vivo Energy equity funds 100% of the project cost, including development
- Vivo Energy Fuel & Lubricant supply contract

# **VIVO ENERGY BESPOKE PPA**





Highly experienced team providing a turnkey, tailormade solar and battery storage project; integrating fully with the mine's thermal power plant.

Sized to align with the mine's cost savings and carbon emission reduction strategies.

Zero upfront cost and zero termination penalty beyond life of mine.

Land Rights: lease - free right of access for the term of the lease.

Vivo Energy will apply their longstanding in-country experience.

Options on transfer of ownership of project to mine post-term of PPA.

# SOLAR BATTERY PROJECT WORKED EXAMPLE



Mine Average Load 32M
Mine Peak load 35 MW

Site Solar Resource:
Use of Solar GIS 2600 kWh/m2/year

Land requirement at mine site

1.75 Hectares per MW

Minimum Life of PPA

10 years – mine option to purchase after year15 – power pricing has zero escalation

Construction & Logistics

Vivo responsible for the whole project from development to decommissioning

Lead time to operation

6 months to develop and sign PPA – construction period 12 - 18 months Design life of 25 years



# SOLAR BATTERY PROJECT WORKED EXAMPLE





	PV MWp	BESS MW	BESS MWh	Solar Penetration	CO2 saving per year (Tonnes)	Fuel Price (\$/litre)			
						0,72	0,78	0,832	0,89
						Annual Savings year 1 (\$000)			
Scenario 1	38	9	9	28%	51 705	3 675	4 698	5 585	6 574
Scenario 2	74	32	64	46%	83 502	4	1 675	3 122	4 737



# **EXAMPLE @ VIVO ENERGY PPA TERMS**



### **KEY PPA TERMS**

Right to Use Land for Solar & Storage Project

On-going O & M (including monitoring), Accommodation & Access

**Security** 

**Parent Company Guarantee** 

**Fuels & Lubricants Contract Inclusion** 

**Force Majeure** 

**Early Termination Provisions** 

**Minimum Term of PPA** 

**Tariffs** 

**Escalation Rates** 

### **DURING PPA INITIAL TERM**

- Required
- Required
- To be provided by the mine
- Required for initial life of mine term
- Cross default provisions with the PPA
- Standard FM provisions will apply
- Early termination permitted, subject to conditions being fulfilled and a termination payment
- Proven life of mine minimum
- Tariff dependent on term
- Zero escalation

### **POST PPA INITIAL TERM**

- Required
- Required
- To be provided by the mine
- Requirement removed for subsequent terms in the event the mine continues operation
- Required as payment guarantee
- Will remain
- No termination payment if PPA terminated at a year's notice
- Asset purchase of PPA remains as long as mine operates pricing discounted
- Tariff discounted
- Zero escalation





- Vivo Power will undertake responsibility for the project, covering all costs throughout the life cycle of the project (including development).
- Vivo will work in partnership with the mine and its engineers to develop an optimal solution
- Zero Capital cost to the mine

- **Full energy solution –** provide power, fuel and lubricants; allowing customers to focus on their core business.
- Cost saving implementing a PV/BESS hybrid power plant results in a reduction of more expensive thermal power generation.
- Carbon footprint reduction reduce carbon emissions by 30-50% by implementing a PV/BESS hybrid power plant.
- Balance sheet funding avoids complexities of project financing and no funding required from customer.













# **Understands the complexities of Africa**

Vivo has operated in Africa for 12 years. Vivo local OU provides essential support through a long track record of successfully operating in African countries. This incountry experience reduces execution risk in project delivery, through understanding the complexities, logistical constraints and regulatory environments.



### Track record

The power team has a track record of closing, constructing and operating renewable power projects in Africa; and has recently energized a PV plant in Mali.



# Reduction in security

F&L supply contracts cross default with the Power Purchase Agreement reduces the level of additional security required.



# Highest HSSE standards

The core operating philosophy of Vivo Energy is implemented on all our projects.



# Continuous improvement

Continually assessing technological advances in PV, batteries and other technologies to determine how these can be integrated into the project to further enhance the AICP and ESG.





### **Finance**

Own Build - Funding required and must be low rates to enable LCOE of own build to compete with tariffs under PPA

PPA - No funding required, balance sheet finance used by Vivo allows low-cost funding and lower LCOE compared to debt finance/loan options



### **Term of project**

Own Build - Difficult to reach low LCOE for project aligned to short life of mine term, ancillary costs relating to installing and commissioning have high financial impact

PPA - Different PPA terms on offer, all competitively priced due to ability to finance at low cost and removal of equipment for use at other locations



# Solar equipment lead times

Own Build - Longer due to once-off purchase

**PPA -** Shorter due to pipeline of projects requiring equipment



# Storage equipment lead times

Own Build - Very difficult to source large scale storage solutions

PPA - Relationships with storage equipment providers allow availability and lead times for commissioning in 2023







# Procurement & logistics

**Own Build -** Will require dedicated team to manage

**PPA** - Use existing F&L country teams and experienced contractors



# Construction, commissioning & operation

Own Build - Will require dedicated team for construction, commissioning and operation (over life of project), all at cost additional to sourcing equipment

**PPA** - All work and equipment costs are included in the PPA tariff



# Time to complete project

Own Build - Need experienced team to optimise output at commissioning & over life of project, no incentive to maximise

PPA - Ability to install by October 2023? Providing cost and carbon emissions savings in the short term (and aligning with decarbonization roadmap milestones)



### Performance guarantee

Own Build - Need experienced team to optimise output at commissioning & over life of project, no incentive to maximise

PPA - Output level guaranteed and optimised to maximize income for Vivo and green electricity for mine