



aggreko

# Hybrid Power Solution Development with Aggreko

29 July 2021

# Hybrid Power Solution Development with Aggreko

aggreko

**Warwick O'Dell**

Manager Microgrids & Storage Solutions – Australia Pacific, Aggreko



## Safely working with **energy**

- Always identify and isolate all sources of energy
- Always secure any isolation using unique lock
- Always prove that isolations are effective before starting work
- Never carry out tasks or activities beyond your level of authorisation



## KEY FACTS

**6,008 MW**

Average power on hire

**£1,365m**

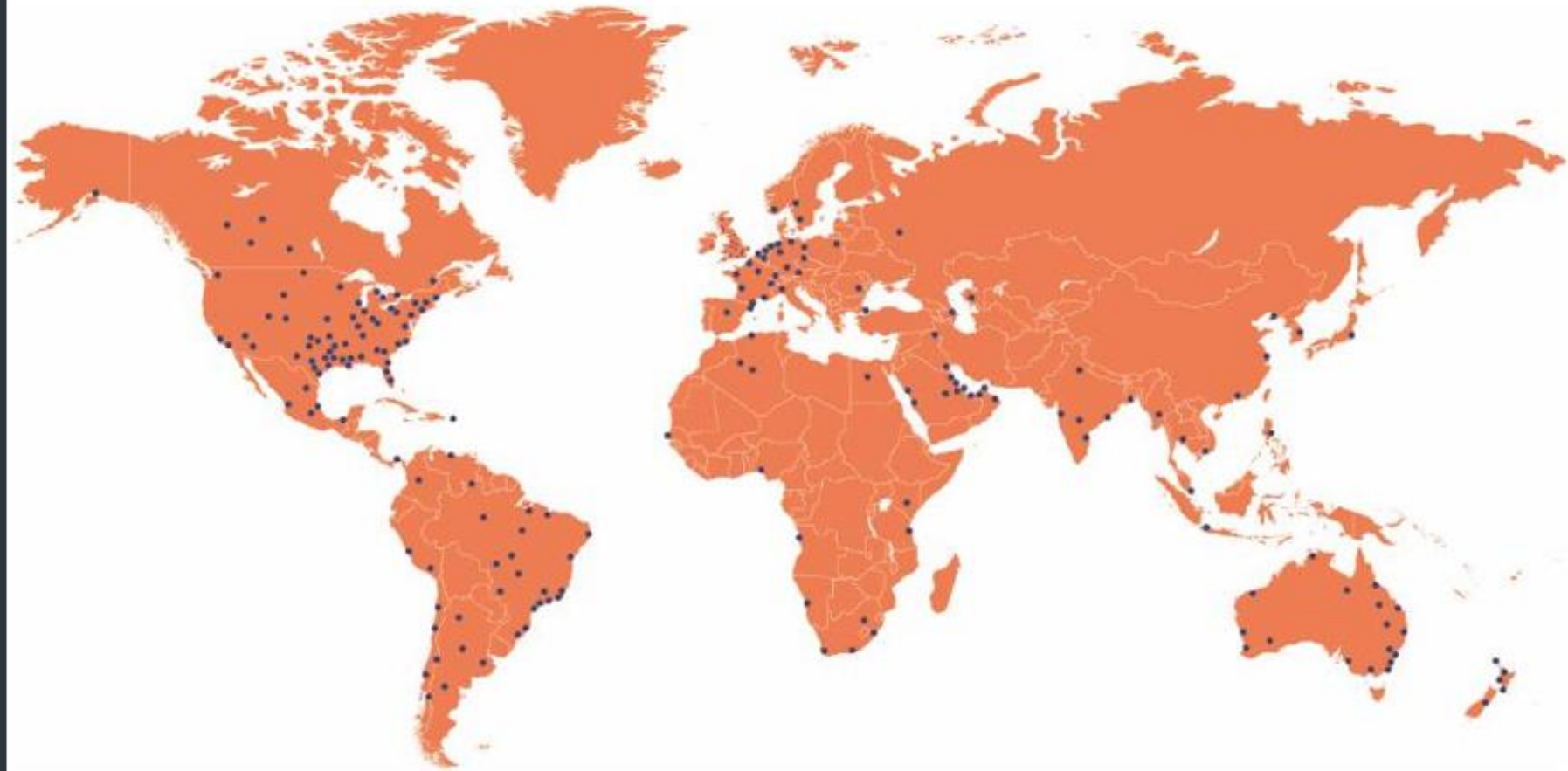
2020 revenue

**182 locations**

Sales and service centres

**80 countries**

Where we operate



**Global knowledge, local expertise**

Supporting mining customers worldwide



aggreko



# Guiding mining to net zero.

BY 2030

Reduce customer  
diesel use by

**>50%**

Reduce local air  
quality emissions by

**>50%**

**Net zero  
emissions**  
across our own  
business


BY 2050

 **ALL  
SERVICES  
NET ZERO**

## POLL QUESTION

---

aggreko



What hybrid elements have you considered when implementing **renewable energy for your mine site?**

# CLIENT REQUIREMENTS



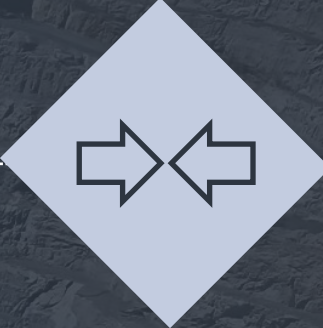
**Strategic Objectives**



**Lifecycle**



**Loads**



**Constraints**



**Sensitivities**

# COMMERCIAL CONSIDERATIONS

---



**Flexibility**



**Performance  
Requirements**



**Commercial Risks**



# MODELLING TOOLS

## Technical Tools



PowerFactory 2020



## Economic Tools



## POLL QUESTION

---

aggreko



What challenges have you encountered when implementing **renewable energy** for your mine site?

# CASE STUDY INPUTS



## Strategic Objectives

STABILITY  
LCOE  
DECARBONISATION



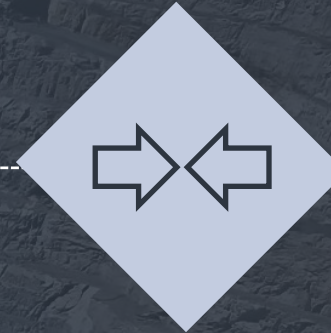
## Lifecycle

DETAILED  
FEASIBILITY



## Loads

10MW PEAK  
8.5MW AVERAGE



## Constraints

DIESEL &  
TRUCKED GAS  
SOLAR & WIND  
NO GEOTECH



## Sensitivities

15 YEAR CONTRACT  
\$15.5 / GJ GAS  
EXCLUDE LGC'S

# RENEWABLE OPTIONS



**Redeployable Solar**



**Tracking Solar**

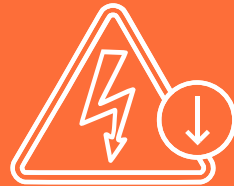


**Wind**

**Demand side considerations**



**System requirements for Redundancy**



**System requirements for stability**



# ECONOMIC ASSESSMENT

---



**Sizing**



**Energy contribution**



**Cost of generation  
assets**

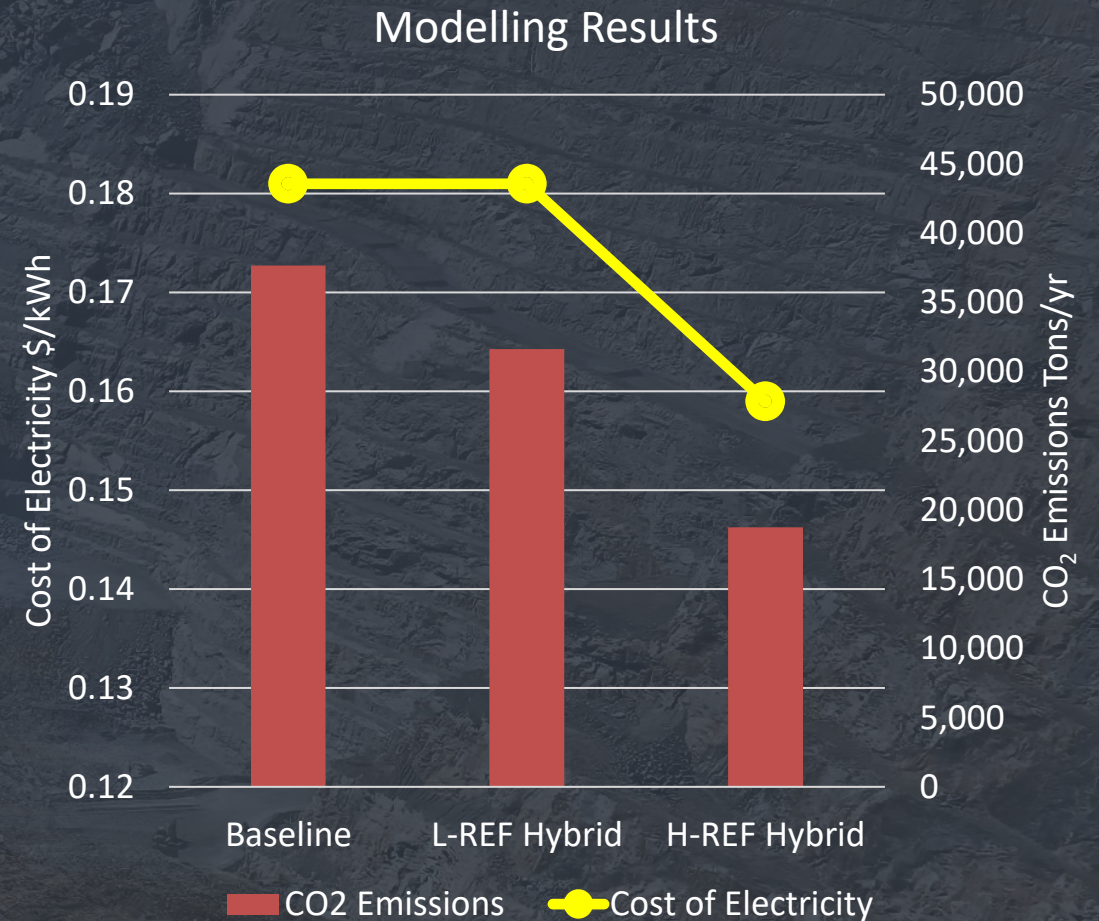


**Cost of stability  
assets**

# MODELLING RESULTS

	Baseline	L-REF Hybrid	H-REF Hybrid
Primary Generation	ICE - 10.8MW NGG	ICE - 10.8MW NGG PV - 5.99MWp	ICE - 10.8MW NGG Wind - 8.0MW PV - 2.4MWp
Stability Elements	ICE	ICE Y.Cube BESS	ICE Y.Cube BESS SynCon
Renewable Energy Fraction	-	17.90%	52%

Results			
Cost of Electricity	0.181	0.181	0.159
CO2 Emissions	37,661	31,624	18,759



# DEPLOYMENT, OPERATIONS AND MAINTENANCE



**Fuel transition**



**Asset optimization**



**New technologies**



# SOLAR HYBRID PROJECTS



## Bisha Mine



**KEY FACTS**

**7.5 MWp**  
Solar power capacity

**22 MW**  
Produced by generators

**12-13 %**  
Fuel savings

## Granny Smith Mine



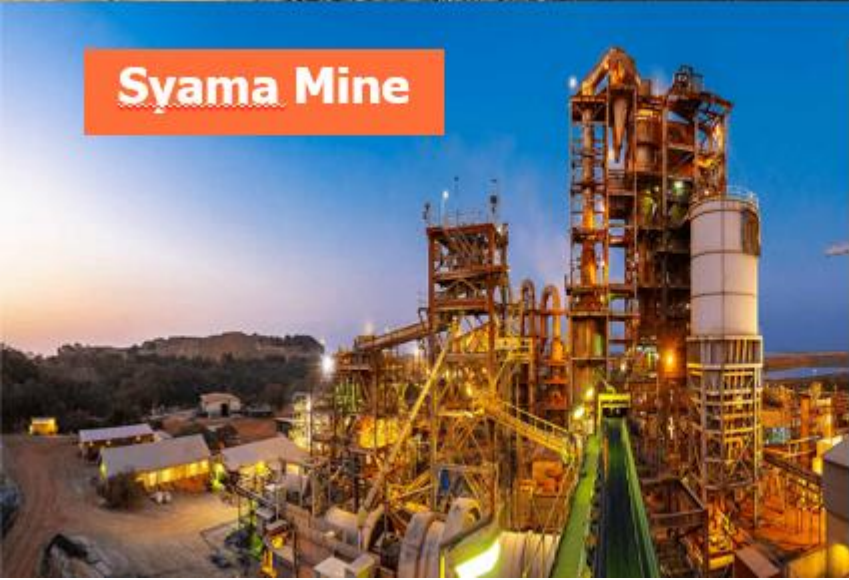
**KEY FACTS**

**27 MW**  
Gas power

**8 MW**  
Solar power

**2MW/1MWh**  
Battery storage

## Syama Mine



**KEY FACTS**

**40 MW**  
Wartsilla Powerblock

**10 MW**  
Batteries

**30 MW**  
Solar

## Salares Norte Project



**KEY FACTS**

**16 MW**  
of diesel power

**9.9 MW**  
of solar PV

**\$7.4 Million**  
cost of energy savings

Q&A

**aggreko**

**[aggreko.com](https://aggreko.com)**