#### **CUSTOM DESIGNED RELIABLE TURNKEY RENEWABLE ENERGY SOLUTIONS**

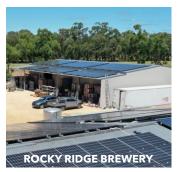
#### BATTERY STORAGE • OFF GRID HYBRID SOLAR PV SOLUTIONS • EV CHARGING



MINING



COMMUNITY



AGRICULTURAL



RESEARCH



COMMERCIAL



**EDUCATION** 



TOURISM



**HEALTHCARE** 









Perth - Yamarna
Gold exploration
Camp distance
1152 km











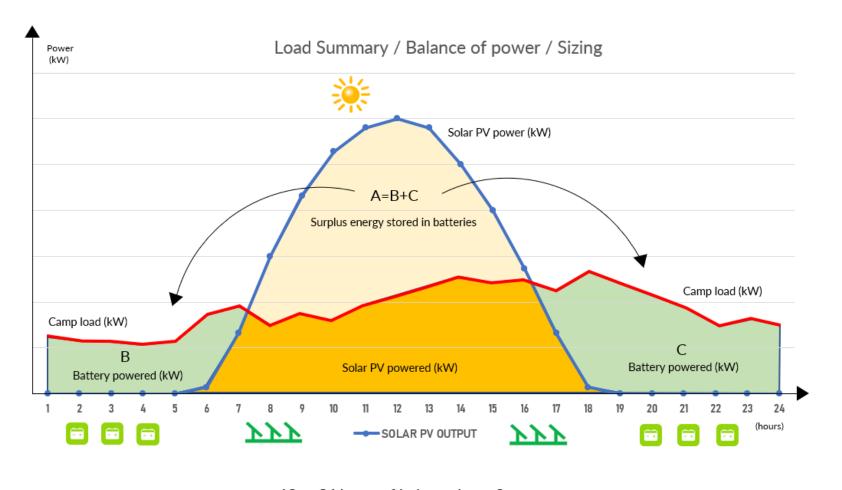
# **Feasibility Study**

**Collecting information** 

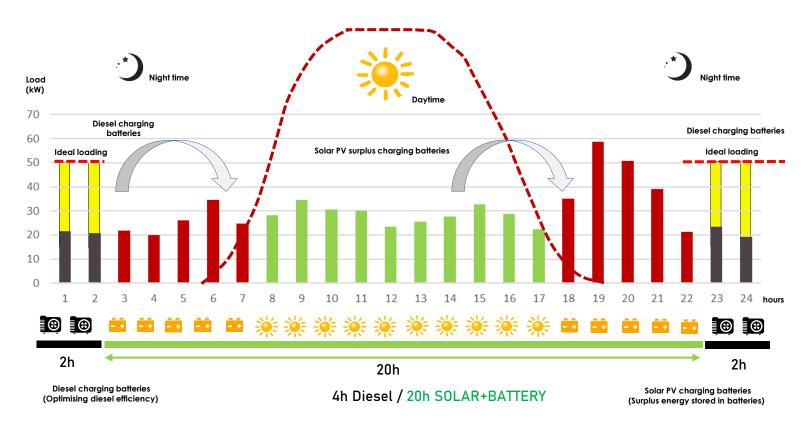


# Load Metering



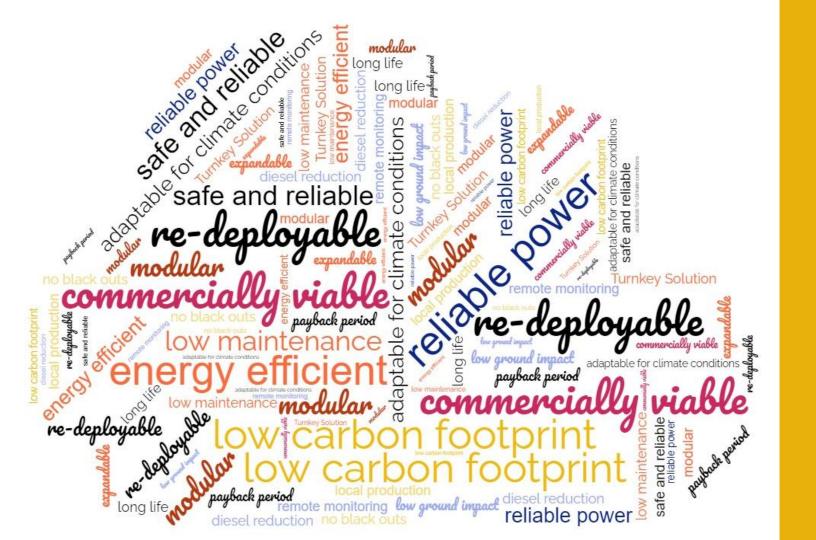


#### 187 kW Solar Array ● 408 kWh Battery



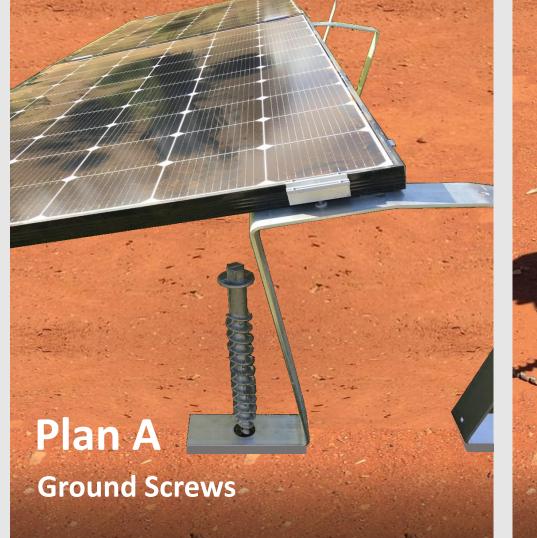
BATTERY CHARGING / DISCHARGING STRATEGY 2x

**DESIGNED TO SAVE 70% DIESEL** 



# Re-deployable Modular Solar Array











































# **Energy Efficiency Maximisation**



# Improving Efficiency and Innovation

1



East-West Facing Solar PV

2.



Fast Battery Charging Twice a Day

3.



Ideal Loading and Temperature

4.



Dust proof & temperaturecontrolled Energy Hub

5.



Automated Energy Management

6

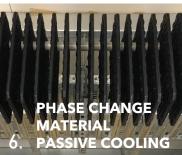


Phase Change Material Passive Cooling

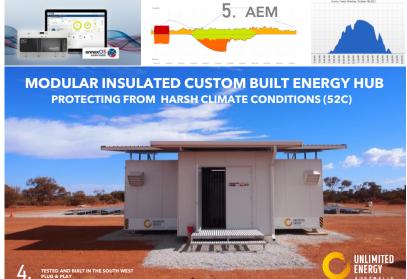














# Power / Diesel usage

2019

2020

2021

2022





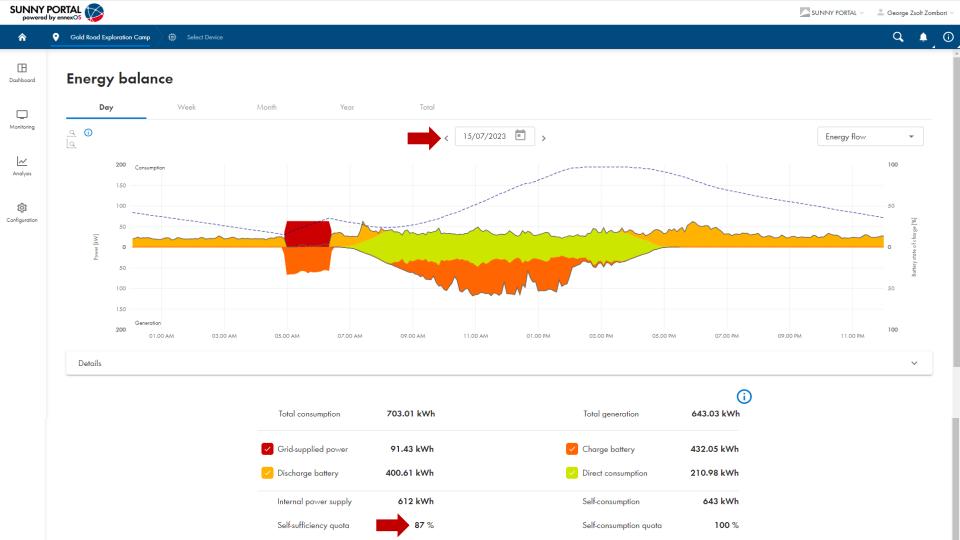




100%



Yamarna Solar and Energy Hub 187 kWh solar array plus 408 kWh battery storage designed to provide up to 70% Camp power requirements







**368**hot air balloon
CO2 saving (147,500 m³) = 295 tonnes





The annual energy cost savings help Gold Road deliver more exploration in the region Reducing ~295 tonnes of CO2 emissions annually Equivalent to ~368 hot air balloon volume



# **2011**Budapest / Hungary / Europe









SEN

# **2022**Joondalup / Western Australia







#### **VOLVO ELECTRIC BUS**



- Longest Cat Bus route 5.2km's
- 35 trips per day = 182km
- Allowing 1.5kwh per/km @ 182km's = 273kwh
- 376kw 273kwh = 103kwh remaining on return.
- Volvo bus will have 376kwh Battery
- Made up of 4 x 94kwh Battery Packs
- Charging up to 750v DC
- 100kw Max Charging







Transperth's first electric bus begins service on Joondalup CAT route powered by Tesvolt energy storage technology. The flagship project is designed using a high voltage EV fast charging station, 100 kW solar power array and Tesvolt 307kWh High Voltage Battery Storage System. The modular Tesvolt battery system is capable to store the surplus Solar PV energy generated during the day and can be discharged by the Electric CAT buses when returned to the depot.

"It is envisaged that the Perth CAT bus network will transition to electric buses" - PTA

Unlimited Energy Australia provided design, coordination and supply of the Energy Storage system.

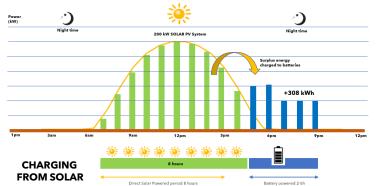


www.unlimited-energy.com.au 1300 765 007



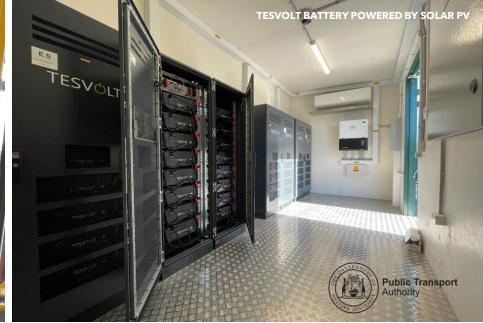
Tesvolt battery container 307kWh storage











Electrifying our transportation / Unlimited Energy Australia - George Zombori



# Why TESVOLT Energy Storage?

## Proven project references in Australia (UEA-Tesvolt)

Solar Farm + Battery Storage, Yamarna Exploration Camp WA. Monash Uni, Christmas Island, Rocky Ridge Brewery, Pemberton, Maniimup Farm, Perth Transport (PTA) E-bus, Sandvik Centre,

8 years track record in Australia delivering safety and reliability



DC fast discharging is essential for continuous power supply when your battery state of charge is lower than 50% but power surges and draws need to be handled Example: 20% SOC (state of charge) = 100kWh,

70kW power required - no issues, surge or peak shaving, etc.

### Safety & efficiency comes first, TUV certified

Tesvolt storage systems are currently not only among the highest performing storage systems on the market but are also among the safest.









### Flexibility to expand, modular system

Modular open rack battery architecture 2-16 modules, flexible extension / additional rack can be added to meet future demand up to MWh scale

### Award-winning battery management system (BMS)

The highly efficient, safety-orientated and certified battery management system developed by TESVOLT comprises the active battery optimizer (ABO - monitors and controls each individual cell in a battery module (stack) and the active power unit (APU monitors, networks and controls the whole system).

#### Made in Germany

Tesvolt to grow ESS manufacturing capacity 10-fold with new plant in Germany, in the town of Lutherstadt, Wittenberg. Construction on the new plant will start in spring this year and be completed in 2024, with an eventual annual production capacity of 4GWh. Our new Gigafactory is set to produce up to 80,000 storage



systems per year.

Oct 2022 - Certification body TÜV Rheinland has classified TESVOLT battery storage systems as safe. The storage systems passed the prestigious institute's rigorous safety tests, making TESVOLT one of the few manufacturers on the market that can verify the safety of its energy storage systems for commerce and industry with certification from the independent testing institute. The certificate confirms both the electrical and functional safety of its products.

Tesvolt Australia providing you full local technical support



#### Award winning technology





SAFETY

FIRST









LARGEST PROJECT AWARD GLOBAL LEADING PROJECT AFRICA



# 2022-2023

### First year of electric bus travel in Perth a success



They might be decked out in eye-catching red livery, but the electric buses operating Joondalup's CAT route have been kicking significant green goals since going into operation one year ago.

Operated by Transperth contractor Swan Transit, the four Volvo battery-electric buses - which were introduced into service in stages since the first trip was made on February 28, 2022 - are powered by Tesvolt lithium-ion batteries and create minimal greenhouse gas emissions, providing a more environmentally-friendly public transport option for commuters.

The electric quartet has carried an estimated **250,000+ passengers in the first 12 months** and covered more than **140,000km**, saving about 230 tonnes of carbon dioxide emissions in the process.

As part of the rollout, modifications were made to the Joondalup bus depot to include a high-voltage electric vehicle charging system, which allows the bus batteries to be recharged through a combination of the existing grid network and a 100kW solar array connected to a large on-site battery storage system.

Transperth spokesman David Hynes said it was easy to see why this technology was so well received among commuters.

"In February last year, we celebrated the first electric bus to go into service in Perth, a significant step in our ongoing push for cleaner, greener transport technology," he said.

"A year on and our battery-electric buses have become a regular workhorse in the Joondalup area, carrying a quarter of a million passengers and saving 230 tonnes of carbon dioxide emissions while doing so."

The four buses were delivered under the Public Transport Authority's existing bus supply contract with Volvo, with the company committed to local production in Western Australia for any further orders. (PTA)





















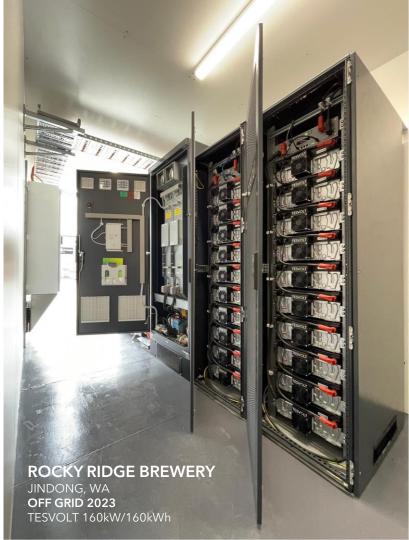
















# A&P