

Case Study 1: VDHT - CEH Cambridge

LOCATION: CEH Cambridge

SYSTEM TYPE: RSPS VDHT – Heavy Twin Platform

APPLICATION: Large-scale environmental water transfer and wetland infrastructure.

OPERATIONAL SINCE: June 2025

CONFIGURATION:

- 15.1 kWh Energy Storage
- 5kW Inverter
- 5.28 kW Solar Generation
- 48V Architecture
- Twin Pontoon-Mounted DAB FEKA FXV 25:15 pumps

System Overview

A high-demand, continuous-duty pumping installation designed to operate autonomously as a direct alternative to diesel-powered systems.

The system was engineered for continuous environmental water movement across challenging wetland terrain, with sustained unattended operation throughout changing seasonal conditions.

Operational Role

- Continuous environmental water transfer.
- Wetland restoration support.
- Long-distance autonomous pumping.
- Remote infrastructure operation.

System Operation

- Daily operation (06:00–19:00 schedule).
- Pump duty cycles are easily adjusted and configured to suit site requirements.
- Alternating twin-pump control.
- Fully autonomous operation with no manual intervention required.

Key Engineering Features

- Alternating twin-pump control strategy.
- Pontoon-mounted pump deployment.
- Autonomous duty-cycle management.
- Thermal stability through all seasons.
- Infrastructure-level remote operation.

Telemetry-Verified Performance

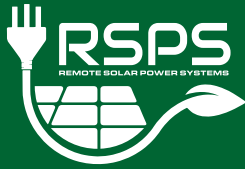
- All data logged in real time.
- Accessible remotely via RSPS telemetry.
- Verified over extended operational periods.
- Based on measured system behaviour, not modelling.

Powerlock™ autonomous load management

The RSPS Powerlock™ system continuously monitors battery conditions and automatically manages high-demand loads to protect long-term battery health while maximising operational productivity.

This allows the installation to operate aggressively during strong solar conditions while automatically protecting itself during poor weather or low-energy periods, without operator intervention.





Real-World Performance

- Sustained high daily water delivery.
- Multi-megawatt-hour cumulative PV production.
- Telemetry-verified operation.
- Proven continuous-duty field performance.
- Autonomous recovery and protection behaviour.

What This Demonstrates

Continuous, real-world load handling

Sustained operation under continuous electrical load, not intermittent or simulated demand.

Efficient use of available solar energy

High conversion of available solar into usable work, with around 95% PV utilisation.

Stable battery performance

Controlled charge and discharge behaviour with consistent recovery across daily cycles.

Engineered thermal stability

Internal conditions remain controlled year-round. The system stays warm enough to avoid condensation in winter, while passive cooling prevents overheating in summer.

True autonomous operation

The system adapts to solar conditions automatically, requiring no manual intervention.

Diesel replacement capability

Delivers performance comparable to diesel systems, without fuel, servicing or refuelling requirements.

Key Takeaway

The CEH VDHT platform demonstrates that properly engineered solar infrastructure can replace diesel systems in demanding, real-world environmental applications.



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