Re-Calibrated Ground Source Heat Pump using Calibrate Analytics©

Case study

H Timmis Farms near Telford

Background

Client: H Timmis Farms near Telford. A poultry farm of 300,000 broilers with a 10-year contract supplying a major supermarket. The farm installed a ground source heat pump and solar technology 7 years ago with a 3rd party supplier but it was not working efficiently and was costing the client far more than it should to run. If installed and maintained correctly, heat pumps should be immensely efficient, with multi-heat, chilling and energy-generating opportunities.

Poultry needs heat and it's time critical getting the sheds to the right temperature of 32°C and remaining consistent. However, energy costs had doubled and were exceeding budget with annual costs going from £220,000 to £440,000 and still climbing.

Project: Calibrate had seen many similar cases and approached the owner with a proposal of how to get the heat pump working optimally to mitigate rising energy costs. As the technology has moved on a pace since installation, lack of maintenance and upgrades left the pump a financial drain rather than an appreciating asset. Having developed Calibrate Analytics© pre-Covid, a clever controller to interrogate the pump and site's energy use and identify ways to save money, Calibrate were in an ideal position to optimise the system and significantly save costs.

"These improvements have had a massive impact on my bottom line by slashing my electricity input from the grid to offset much of the cost increases meaning a swift return on investment of my outlay for the re-works. In addition, I am using much fewer KWh to run the heat pump, so this has significantly reduced my CO_2 output from grid electricity, making the farm greener."

Rob Timmis
H Timmis Farms

Timeline

April 2022 - Calibrate met with Mr Timmis to discuss his requirements and ways to re-invigorate his renewables systems.

May 2022 - Connected Calibrate Analytics© to Mr Timmis' system and started running the bespoke software in real time to demonstrate the poor efficiency of the system.

June 2022 - Worked with the client to agree a plan of works to maximise potential for the system.

July 2022 - Performed some strategic 'tweaks' to the system that would deliver impressive results.

August 2022 - Calibrate re-engineered the system for better performance in a tightly squeezed slot of just 4 days before the chickens were delivered.

Process

Taking on other installers' work is not something Calibrate do lightly as it can be fraught with problems, but given the context and market demand for bringing perfectly serviceable systems like Timmis' back on track, Calibrate have devised a business model for optimising systems using a mix of data analytics and engineering re-works. Calibrate plugged in the innovative software and could show in real time, what some simple changes would make to the farm's bottom line. From the data gathered from the controller, the team set about designing a series of improvements to transform performance.

Outcome

The heat pump's co-efficiency of performance sat at just 2.0 with Ofgem's lowest requirement being 2.9. Not only was the system under-performing, but it was also putting the farm's substantial RHI tariff rebate in jeopardy. As a result of the control software addressing system inefficiencies and parasitic loads caused by unnecessary plant running times, the COP quickly increased to 3.0 finally taking it beyond Ofgem standard.

The next big step-change occurred when Calibrate carried out pipe re-works to the heating loop. The outcome was a COP jump to over 4.0, a 100% improvement on its original state.

The Figures

£117,000
Energy savings year 1

25%
Reduction in KW usage on previous 3 years

1.1 years
Re-works return on investment

136
Tonnes CO_2 savings per year

Calibrate
Energy Engineering

Calibrate
Energy Engineering

Environmental • Energy • Engineering

Next Steps

Following assessment through Calibrate Analytics© and optimisation through system re-engineering, the next step that Timmis and other businesses can then consider after a software upgrade is Calibrate's Gridflex service. This is where the controller acts as an energy aggregator, adjusting electricity use at peak times and selling excess energy back to the National Grid.

Gridflex fully manages this behaviour, providing clients with a totally hands-free passive income running in parallel to business as usual.

"To future proof your business with financial, operational and environmental resilience, it is well worth installing Calibrate Analytics as stage one of your business transformation strategy, to allow energy to work for you, rather than against."

Rob Timmis
H Timmis Farms

Stage 1

ANALYSE | Install

Calibrate Analytics©

Innovative energy assessment to identify energy behaviours and how they can be improved

- Bespoke software platform
- Real time, fully adjustable control of power generation and use
- Control everything from heating through to lights
- Simulate the benefits of power generation or power savings
- Track, & monitor everything from your phone or laptop.

Stage 2

OPTIMISE | Re-Calibrate

Calibrate Energy Engineering

Adjust and Engineer improvements to optimise performance

- Automate and control your energy-hungry equipment correctly
- Fine tune processes in real time from your phone
- Improve mechanical and electrical system with our in-house commercial and industrial renewables specialists
- Hands-off Maintenance Package for peace of mind.

Stage 3

CAPITALISE | Gridflex

Gridflex Flexible Energy Solutions

Grid balancing for extra income, similar to an energy stock exchange

- Turn off heat pump at set times and receive ££ from the National Grid
- Turn up heat pump when there is too much electricity available at the Grid and receive ££ to use cheap power
- Trade carbon credits
- Balance onsite usage to match power generation, avoiding import costs
- Digital real time dashboard to evidence power income.

Contact:

info@calibrateltd.co.uk / 01668 215 544

Calibrate Energy Ltd

Calibrate Energy Engineering

@calibrateltd

@energycalibrate

nqa ISO 9001 QUALITY MANAGEMENT

MITSUBISHI ELECTRIC
Accredited Installer

www.calibrateenergy.co.uk

*All formulas and calculations are derived from industry suppliers and MCS guidelines, it is advisable to have the calculations and formulas checked by a certifed mechanical engineer, and as such, Calibrate Inc. ltd (Company # 08277206) will not be held liable for any incorrect formulas or calculations or any accidental misrepresentation.