VITAL ENERGi

CASE STUDY

Swansea Bay University Health Board

FOUR PHASE ENERGY CONSERVATION & GENERATION PROJECT

PROJECT OVERVIEW

Our long-term partnership with Swansea Bay University Health Board (SBUHB) began in 2019. They were faced with an ageing, fossil fuel-based heating infrastructure which was no longer efficient, alongside other legacy systems such as lighting and HVAC systems.

During a site visit we completed an extensive energy audit and identified the best value-for-money upgrades which would deliver the highest levels of carbon reduction.

Over a six-year period, we have delivered four phases of works which focused on energy conservation, renewable energy generation, energy storage and the decarbonisation of heat. As a result, SBUHB has achieved greater energy security, significantly lower energy bills, and a reduction of nearly 12,000 tonnes of carbon emissions since the first phase went live in 2021.

VITAL SOLUTION

We helped the health board realise their strategic ambitions by acting as a complete energy partner. In addition to the core design, delivery, operation and maintenance services, we also performed extensive energy and financial modelling, project budget development, long-term performance projections and brought this all together into a series of investment-grade business cases which were instrumental in giving the client long-term budget certainty.

The Phases

·Phase 1 (2019-2021): This initial phase laid the groundwork for energy efficiency across the health board's estate. We replaced or upgraded 32,000 light fittings with modern LED technology, overhauled the HVAC system and installed a roof-mounted solar array with a capacity of 178 kWp. We then upgraded the Building Management Systems (BMS) to ensure buildings used their energy more intelligently.

· Phase 2 (2021): Phase 2 focused on increasing renewable energy generation and saw the creation of a 4MW solar installation at Brynwhillach Farm. This connected to Morriston Hospital via a 3km private wire network. This phase also included necessary in-hospital electrical works and the implementation of robust security systems to protect the new infrastructure.

PROJECT SUMMARY:

CLIENT
Swansea Bay UHB

PROJECT
Energy Conservation Measures, , Solar, Battery Energy Storage & Heat Decarbonisation

THE BENEFITS:

- £1.4m in financial savings in 2023
- Cumulative energy bills savings of approximately £5 million
- 13,700 tonnes of carbon savings since 2021
- 4 phases, each designed to complement each other
- United Kingdom's first solar farm to be dedicated to a live NHS hospital

(Right) Upgrades to the lighting system are one of the strongest performing ECMs with regards to payback.. (Below) The new Battery Energy Storage System, giving the Health Board more flexibility over when it uses its electricity.

'Vital were flexible, which is a must for working in health care. If access to a sensitive area became available, they would stop what they were doing, get that work done as quickly as possible, and then return to what they were doing.'

DES KEIGHAN - ASSISTANT DIRECTOR OF COMMERCIAL AND CONTRACT MANAGEMENT, PFI HAND BACK, COMMERCIAL AND DECARBONISATION - SWANSEA BAY UHB

· Phase 3 (2021-2023): Building on the success of previous work, Phase 3 focussed primarily on the decarbonisation of the Health Board's heating system. We installed eight Air Source Heat Pumps to provide a more sustainable heating solution. An additional 4,000 LED lighting upgrades were installed, and more roof-mounted solar arrays totalling 240 kWp were added to increase on-site renewable energy generation.

·Phase 4 (2023-2024): The latest phase was designed to maximise renewable energy capacity and improve energy storage capabilities. It included a 1MW extension to the existing solar farm, increasing its output by 25%. Additionally, the new Battery Energy Storage System can store up to 2MWh of electricity and provide 1MW of electricity at a time. In addition to the solar energy, this can take advantage of smart tariffs by charging the battery at nighttime when energy prices are lower.

Funding & Procurement

All four phases of the energy improvement works were delivered through RE:FIT Cymru – a Welsh Government-backed programme, with each phase separately funded through sources such as the Covid Recovery Fund, Invest to Save, and interest-free loans.

For each RE:FIT Cymru project, we began with detailed energy and financial modelling to build a high-level appraisal which is instrumental in securing funding. This was followed by a full investment-grade proposal, which refined the scope of works, projected performance, and assessed the long-term environmental and financial impact.

Early & Sustained Engagement to Minimise Disruption

In complex, live environments like healthcare, we take extra care to align with each hospital's needs, working closely with key stakeholders to ensure full understanding and compliance of key areas such as infection control and cleaning requirements. Our flexible approach includes out-of-hours work, careful scheduling, and robust management plans, ensuring smooth delivery with minimal impact.

Utilising Phasing to Take Advantage of Available Funding

Because SBUHB had a detailed decarbonisation plan they were able to phase works in a way which delivered the most benefits. Phase 1, for example, reduced energy usage, which meant that the phase 2 solar farm would provide a higher percentage of the hospital's energy. Phase 3 added heat pumps which can utilise low-carbon electricity, whilst phase 4 increased solar generation and flexibility through battery storage.

In addition to ensuring each phase complemented the others, it allowed us to group works into phases which could attract funding as different funding streams became available.

Monitoring and Verification

Vital View, a bespoke software system, is used to monitor performance and provide regular monthly reports, ensuring full confidence in the system's performance. The system can also automatically alert engineers to any issues so that they can be addressed at the earliest convenience. Each year these figures are verified by an independent provider to ensure the project has delivered as promised.

We ensure these figures are in line with the Energy Performance Contract, guaranteeing the system has met or exceeded our client's expectations.

The Value of Partnership - Carbon & Energy Savings

As part of the RE:FIT requirements, we provided a long-term energy performance contract for each phase, which guarantees KPI'sin key areas such as carbon reduction and energy savings which brings both budget certainty and progress towards their net zero goals.

This approach has already demonstrated considerable success. In 2023 alone, the four phases delivered financial savings of around £1.4 million. These financial savings have been underpinned by significant carbon reductions.

Since the launch of the first phase in 2021, the cumulative impact of these upgrades has been substantial, with circa 13,700 tonnes of carbon saved, and the project has delivered over £5 million in financial savings to date. Notably, one third of the hospital's 15 million kWh annual energy demand is now met by renewable sources.

Taken together, these outcomes underscore the effectiveness of the RE:FIT programme in delivering both environmental and financial benefits, while positioning SBUHB as a leader in sustainable healthcare operations.