VITAL ENERGi

CASE STUDY

Northwick Park Hospital

MULTI-TECHNOLOGY ENERGY SOLUTION AND ECMS

EXECUTIVE SUMMARY

Vital Energi are helping London North West University Healthcare NHS Trust's transition to net zero by 2040 through the design and implementation of a fully integrated, self-funding, multi technology energy solution at Northwick Park Hospital. The innovative solution comprises air and water source heat pumps, a Battery Energy Storage System (BESS), solar PV, and a host of energy conservation measures (ECMs). As well as reducing the Trust's carbon footprint by over 2,500 tonnes a year, they'll achieve guaranteed energy savings of £1.9m a year, and the local community will benefit from the creation of a local smart grid.

OUR SOLUTION

The Trust came to the market with the requirement for an innovative solution that addressed the concerns associated with their end-of-life energy systems. The existing 50-year-old steam system was reaching end of economic life, inefficient, and impacting on the reliability of essential heat supplied to the acute hospital estate, which could impact on patient care. These inefficiencies also resulted in higher carbon emissions and increased energy costs for the Trust.

As part of the 15-year performance based contract, we converted the existing steam heating system to a Low Temperature Hot Water (LTHW) distribution infrastructure, and developed a unique energy solution which includes a combination of water and air source heat pumps and a BESS, which was designed to facilitate the integration of heat pumps and other renewable technology into the hospital's energy infrastructure.Working closely with the hospital's facilities

PROJECT SUMMARY:

CLIENT
London North West University Healthcare NHS Trust

PROJECT
Multi-technology energy solution and ECMs

TIMESCALE:
2021 - 2023

CONTRACT VALUE:
£17.6m

KEY FEATURES

> New energy centre fit out and site wide de steaming

> Solar PV array - 1,642 panels, 649.74kWp

> Battery Energy Storage System - 2MW

> Water source heat pump - 200kW

> Air source heat pump - 520kW

> LED lighting upgrades – 5,000

> EC fans – 174

Right: We have installed 649.74kWp solar on 8 roof spaces across the hospital site

teams, we put together a three-phase plan to enable the hospital to make a genuine operational change towards its net zero ambitions assisted by the BESS infrastructure.

The BESS will initially enable the site to maximise the use of onsite generation and help the hospital avoid import electricity at the most expensive times. It is also capable of providing a range of grid services such as frequency response which can provide another source of income to the hospital when the BESS is not providing other onsite services.

The LTHW will be supplied by a gas-fired combined heat and power unit (CHP) with integrated water source heat pump, complete with LTHW boilers and solar photovoltaic arrays. Most CHP units have a second stage intercooler that produces 40-degree heat that needs to be rejected via the dry air cooler, and we are tapping into this circuit with the water source heat pump.

We've also implemented a range of ECMs, including the installation of a 649.74kWp solar PV array across 8 roof spaces, optimisation and upgrades to the existing Building Management System, pipework insulation, and the retrofit and upgrades of existing air handling units and chillers, all specifically designed to reduce the energy consumption and the overall carbon emissions of Northwick Park Hospital.

KEY BENEFITS

Social value and community benefits
By replacing the ageing gas-fired steam boiler systems and associated infrastructure with modern efficient low-carbon equipment, the Trust is able to significantly reduce the emissions of greenhouse gases within the local area, which will improve air quality. In addition, the new heating and hot water infrastructure has been designed and developed to readily accept the integration of further low-carbon technologies. The system has also been designed so it can readily connect to and provide low-carbon heat to district heating systems within the local area.

Enhancing the patient experience
We've implemented a number of site-wide solutions which will ensure optimum temperatures and environmental conditions are maintained within the clinical areas, which improve patient and staff comfort levels. The new lighting upgrades will optimise visual acuity by providing high-quality, optimal lighting levels to provide efficient care, together with enhancing the visual appearance of the wards and common areas to provide a comfortable environment.

Addressing backlog maintenance issues
The project will address backlog maintenance issues associated with the Trust's existing end-of-life fossil fuelled steam boilers, distribution system and calorifiers, which we have replaced with high efficiency LTHW boilers and Plate Heat Exchangers

Future-proof energy scheme
This energy solution has been designed with transition in mind. The new heating and hot water infrastructure has been designed and developed to readily accept the integration of further renewable and low carbon technologies, thus futureproofing the systems in terms of meeting net zero targets. The BESS is making this project resilient for the future too, allowing the community and hospital to benefit and provide flexibility during times of high demand on the grid.