SUSTAINABILITY ACTION

CASE STUDY NHS Grampian Energy Efficiency Project

FOCUS AREA

We recognise our role in ensuring that Scotland achieves its target of net-zero greenhouse gas emissions by 2045. The identification and reduction of greenhouse gas emissions takes place across the whole of the NHSScotland estate, encompassing emissions arising from energy, water consumption and treatment, waste, anaesthetic gases, transport, business travel and from the goods and services we procure. We also engage staff, patients, visitors and other local agencies to contribute to the delivery of area-wide greenhouse gas reduction strategies and plans.

Images supplied by Vital Energy



BACKGROUND AND AIMS

NHS Grampian energy efficiency project comprised a large-scale suite of activities to reduce carbon emissions and to improve energy performance, efficiency and resilience. These activities were focused on an existing energy centre based at the Foresterhill complex in Aberdeen, comprising a Combined Heat and Power (CHP) providing low carbon electricity, heat and hot water to the site (fuelled primarily by Natural Gas). The project sought to utilise the full capacity of the Foresterhill energy centre by connecting it to the nearby Royal Cornhill Hospital site to create a local heat and power network.





GREENHOUSE GASES

For more information contact nss.sustainabilityscotland@nhs.net



ACTIONS

This was a significant long-term project which required engagement across a wide range of partners and stakeholders to understand the feasibility, to assess the technical implications and to get the process through planning. A key element of this was a longterm partnership with Vital Energi who designed, installed and will manage the system for 25 years.

At the centre of the project was a 2.7km energy link between sites (comprising insulated heating pipes and high voltage electrical cabling) to link the CHP to the new site. This new connection was the first of its type in Scotland and not only allowed the CHP to operate at higher efficiency for longer periods, it also provided a more resilient energy source for the Royal Cornhill Hospital (and acted as a replacement for the Royal Cornhill Hospital existing energy centre, this Energy Centre being retained as back up).

The design also planned ahead for the future through the inclusion of additional branches in the system to enable it to be connected to other locations in the future. This significant infrastructure development was complemented by a range of other energy saving initiatives put in place across the estate, including:

- Rationalising the Foresterhill and Royal Cornhill Hospitals HV electrical networks. This entailed the construction of a new HV intake substation and removal of 3 old HV substations.
- Closing and demolishing of an old Steam Boilerhouse on the Foresterhill campus. With the Laundry and CDU now supplied steam from the main Energy Centre.
- Building Management System modifications to enhance monitoring and management of energy
- Lighting upgrades to make lighting more efficient and also provide a better environment for staff and patients (including the replacement of 6,800 existing light fittings with LEDs)
- Over 30 Chilling units were replaced with more efficient equipment
- In depth SCADA monitoring system was installed to improve control over systems

The project was funded by the Central Energy Fund, with predicted net energy savings for NHS Grampian of 12% for CO2e.

KEY BEHAVIOURS

Extending and upgrading the existing Foresterhill energy centre, rather than constructing a new one on the Royal Cornhill site, allowed for a reduction in capital expenditure. Within the first 12 months of operation, the improved scheme saved 5.7 tonnes of CO2e and delivered 3,232,026 kWh of gas and electric savings. The connections will also provide greater resilience for the network to maximise its smooth operation.

LESSONS

This was a challenging project that took significant time and resources to plan and deliver (approximately 3 years from start to finish). However, this time enabled the team to plan and think ahead and to think more holistically about the life cycle of buildings and energy requirements on their estate. This included the longterm maintenance implications of replacing existing infrastructure, possible energy needs in the future, the current and future cost of energy and the impact this can have on longer term decisions.

This consideration took time and effort, but the team at NHS Grampian would recommend this approach "don't be put off by larger projects with longer timescales – now is the time to look into longer term savings... it was lots of effort, but with more effort you can realise more gains!"







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