

Carbon Reduction Plan

Autumn 2022

Commitment to Achieving Net Zero

St Joseph's Hospital (SJH) is committed to achieving Net Zero emissions by 2040, ten years ahead of the UK government target set in 2019. We are currently working to develop a full implementation plan, which we hope will allow us to bring this target further forward. St Joseph's Hospital is early in its carbon reduction journey, and data will become more available and more detailed in years to come, but enough data has been gathered to record the impacts resulting from business growth and carbon reduction projects, which have been prioritised concurrently since 2020.

Company Growth and Development

Context

St Joseph's Independent Hospital Ltd was incorporated in February 2020 and operates from a single Hospital site in Newport, South Wales. Since its incorporation, the company has been growing its activity to increase its revenue and support the NHS and has been reinvesting its surplus into its facilities and equipment to expand its capacity and modernise. This expansion has resulted in increased emissions in some areas, but these have been offset against the Hospital's carbon reduction efforts, which have been underway over the same period, and the organisational growth.

Growth and Carbon Reduction

Carbon emissions per patient have reduced significantly as a result. Since incorporation, the Hospital's annual revenue has increased from **£12m** to **£30m**, the average number of inpatients per month has increased from **279** in the 2020 calendar year to **712** so far in 2022, and the average number of outpatients per month for the same years has increased from **2,229** to **3,308**. Over the period, the Hospital's Green House Gas (GHG) emissions per patient have decreased from **2.15** tCO₂e/year to **1.49** tCO₂e/year.

Capital Works

Capital expenditure has been a significant contributor to the GHG emissions from 2020-2022 whilst the Hospital has been delivering a comprehensive capital investment programme. The Capital Goods emissions category accounted for **34%**, **21%** and **27%** of GHG emissions in 2020, 2021 and 2022, respectively.

At the time of incorporation in February 2020, SJH had two operating theatres. These have since been refurbished and three additional operating facilities have been created; the Day Surgery Unit (and day theatre) in April 2021, and the Clinical Treatment Centre (and minor procedures room) in and the Surgicube (Ophthalmology operating room) in January 2022.

For the purpose of 2022 reporting, YTD figures have been extrapolated to the end of the year.

Towards Zero to Waste

SJH is currently increasing its waste recycling capability. Infection control measures put in place during the Covid-19 pandemic temporarily increased the Hospital's infectious clinical waste volumes, particularly when assessed on a per-patient basis, but these levels are now reducing with recent waste management initiatives.

Zero waste to landfill has been achieved by SJH since its incorporation in 2020, 5 years ahead of the NHS Wales target. Waste contracts are currently being re-procured to increase recycling capacity and reduce clinical waste, and the Hospital has developed an investment plan for waste stations on site, with associated initiatives to encourage recycling. SJH is targeting a **100%** increase in the volume of waste recycled from January 2021 to January 2023, with a further **25%** increase by January 2024.

Emissions Reporting

St Joseph's Hospital has taken its year of incorporation as its baseline with retrospective analysis conducted in 2022, the current reporting year. The Hospital reports on total CO₂e emissions and CO₂e emissions per inpatient. An outpatient visit (consultation or treatment) to SJH typically takes approximately **1 hour**, and will often result in a visit to St Joe's Café. By comparison, an SJH inpatient has an average Length of Stay of **2 days** and, depending on procedure, between **30 mins** and **6 hrs** in the operating theatre (which is highly energy intensive). At this stage in its carbon reduction journey, SJH is predominantly focused on its GHG emissions per inpatient, as the vast majority of CO₂e emitted is associated with inpatient activity.

Energy Usage Over Time; 2020 - 2022

The following graphs illustrate SJH's energy usage over the period 2020 to 2022 in relation to ambient temperature and the number of inpatients treated. The graphs show a direct correlation between temperature and usage of both gas and electricity.

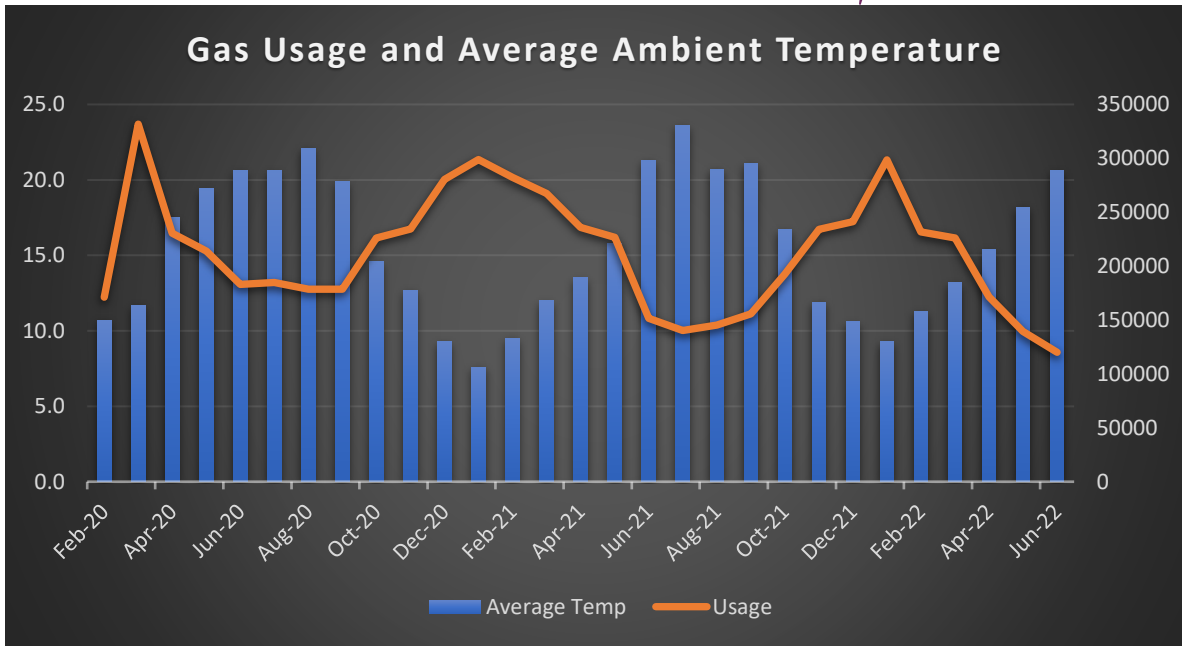


FIGURE1: Gas usage and average ambient temperature over time

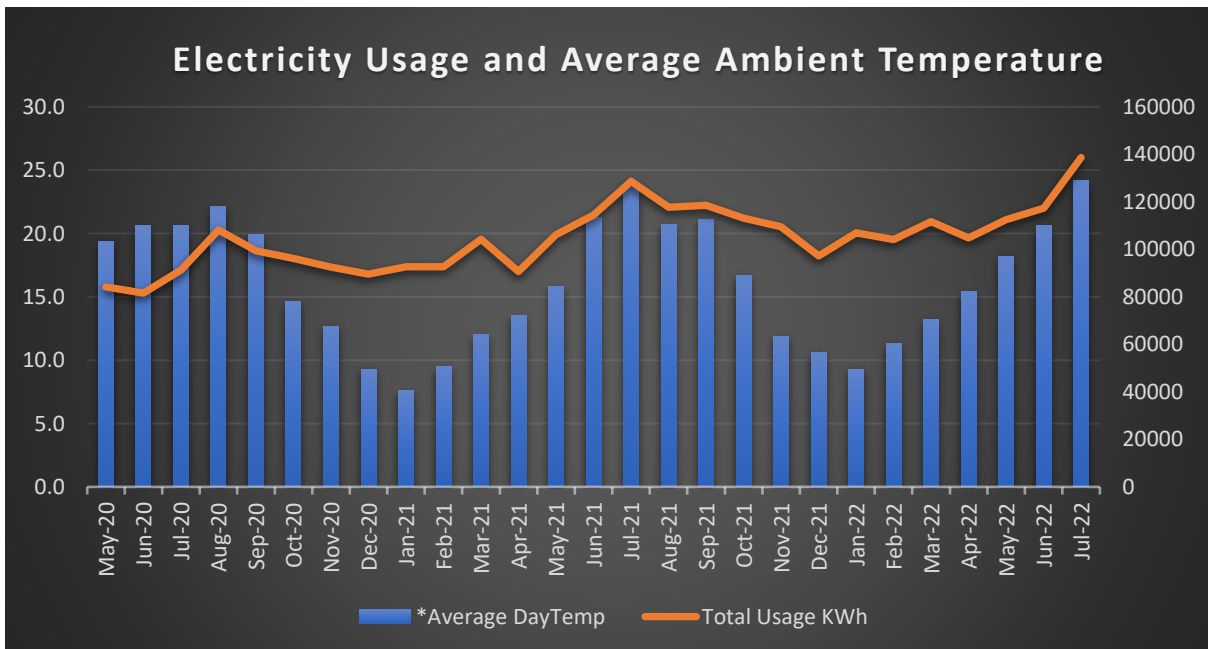


FIGURE 2: Electricity usage and average ambient temperature over time

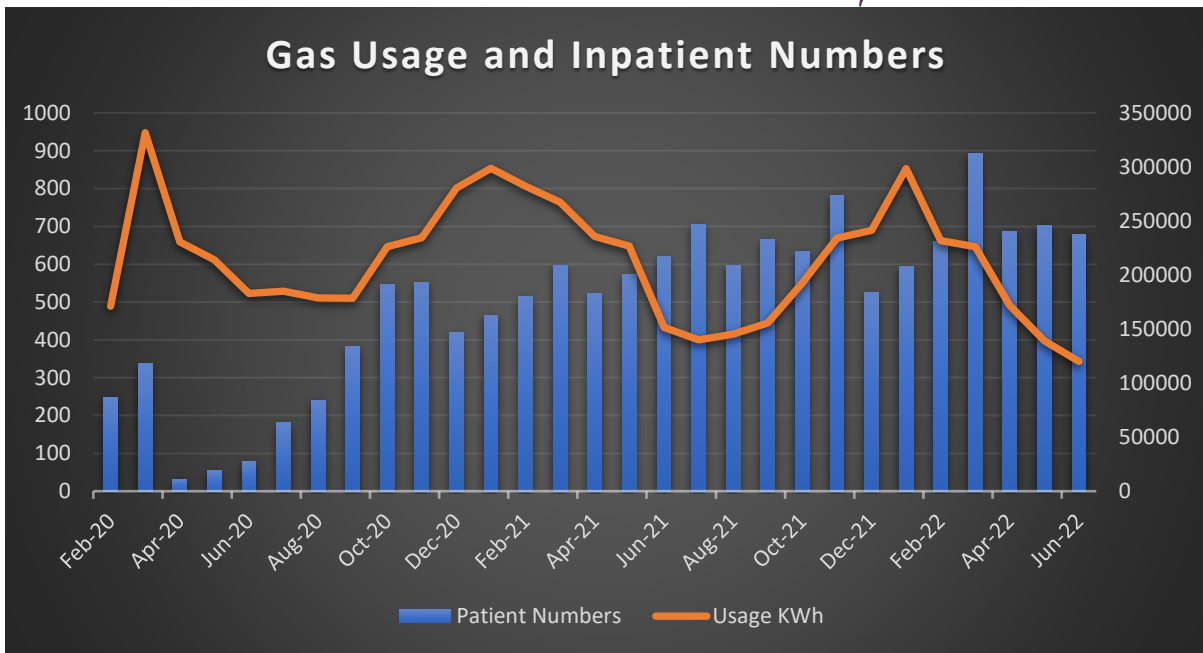


FIGURE 3: Gas usage and inpatient numbers over time

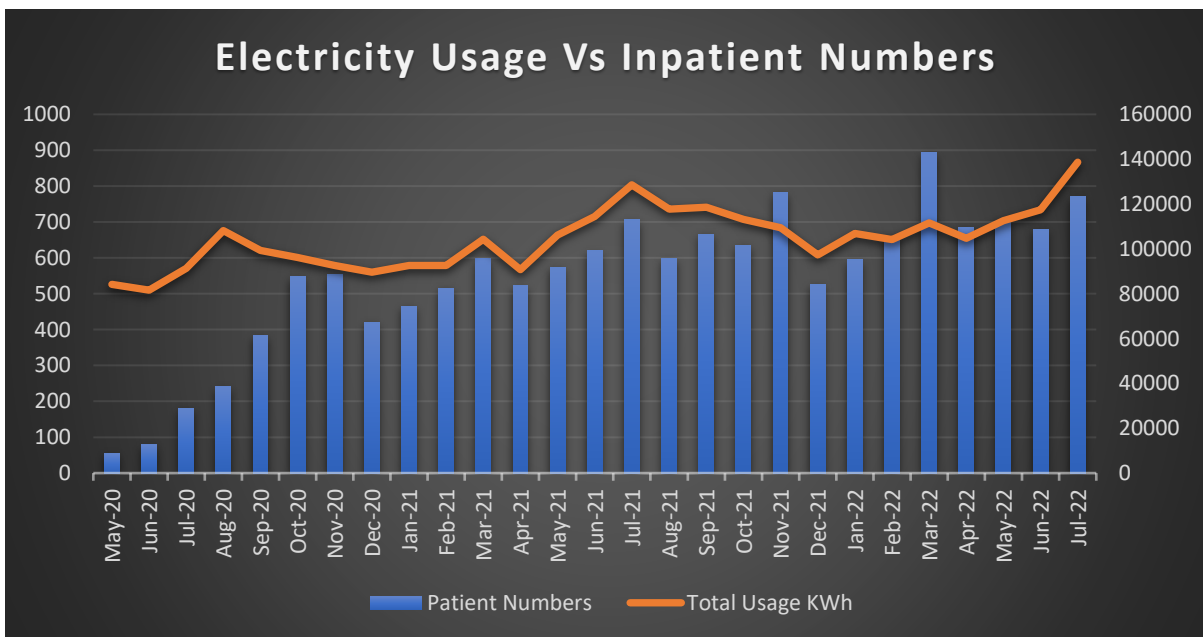


FIGURE 4: Electricity usage and inpatient numbers over time

Comparing energy usage to inpatient numbers illustrates the significant positive impact of SJH's carbon reduction projects. Comparing the years of 2020 and 2022, the total number of inpatients treated has increased by a massive **178%**, with only a modest **23%** increase in electricity usage and a

reduction in gas usage of **3%**, respectively. Considering this on a per-patient basis, the gas consumption reduced by **479%** and the electricity consumption by **225%**.

Key energy usage statistics since the baseline year of 2020 are reported in the table below:

	2020 (Baseline yr.)	2021	2022 (Reporting yr.)	% Change (2020-2022)
Total no. inpatients treated	3,076	7,208	8,544	+178%
Gas consumption (kWh)	2,443,824	2,572,137	2,375,004	-3%
Electricity consumption (kWh)	1,108,512	1,285,812	1,364,712	+23%
Gas consumption per patient (kWh) *	795	357	160	-497%
Electricity consumption per patient (kWh) *	360	178	160	-225%

TABLE 1: Energy Consumption per Patient

**energy consumption per inpatient = approx. 50x energy consumption per outpatient. Per patient calculations have therefore been undertaken using inpatient numbers only.*

Table 1 above demonstrates the effectiveness of SJH's carbon reduction projects in relation to the gas and electricity consumed per patient, and also the intention to switch gas usage to electricity usage where possible. SJH's electricity supply comes from 100% renewable power generation; favouring purchased renewable electricity over burning gas is part of SJH's carbon reduction strategy. This has been achieved to date predominantly through the installation and use of air source heat pumps, which also allows for the flexibility of individual room heating.

Carbon Footprint Over Time; 2020 - 2022

SJH has calculated its GHG emissions based on the UK Government GHG Protocol, categorising them into the three prescribed scopes, and expressing emissions as tonnes of Carbon Dioxide equivalent (tCO₂e).

Scope 1 Emissions

Direct emissions from activities controlled by SJH that release emissions into the atmosphere. This includes the consumption of gas in central heating boilers, hot water boilers, and the Hospital kitchen. It also includes the consumption of diesel in the SJH-owned vehicles.

Scope 1 Emissions Category	What's included in this category?	tCO ₂ e 2020	tCO ₂ e 2021	tCO ₂ e 2022
Gas usage	- Boiler emissions and kitchen emissions	452.11	475.85	439.38
Company-owned vehicles	- Emissions from two diesel-powered vans	0.92	9.42	8.57

TABLE 2: SJH Scope 1 Emissions

Scope 2 Emissions

The electricity purchased for use on site at SJH. The electricity supply contract for SJH is certified as being 100% from renewable sources. Accordingly, the scope 1 emissions associated with the consumption of electricity at SJH on a market basis are zero.

Scope 2 Emissions Category	What's included in this category?	tCO ₂ e 2020	tCO ₂ e 2021	tCO ₂ e 2022
Purchased Electricity	- Electricity purchased from Drax, supplied from wholly renewable sources	258.28	272.59	263.39

TABLE 3: SJH Scope 2 Emissions

Scope 3 Emissions

GHG emissions released into the atmosphere by third parties as a direct result of SJH's activities. Of the 15 categories of Scope 3 emissions, those identified in Table 4 below are of particular relevance to SJH:

Scope 3 Emissions Category	What's included in this category?	tCO ₂ e 2020	tCO ₂ e 2021	tCO ₂ e 2022
Upstream transportation and distribution	- Taxi and delivery Services	0.67	1.15	1.30
Waste generated in operations	- Waste collections - Waste treatment	9.40	9.96	9.98
Business travel	- Employee travel for business needs	3.19	5.56	7.07
Employee commuting	- Employee travel to and from work	83.89	125.40	146.12
Downstream transportation and distribution	- Patient attendances to site	371.91	893.27	860.23
Purchased goods and services	- Supply of clinical equipment/consumables - Provision of medical laboratory services - Supply of non-clinical equipment/consumables (e.g. Catering, Housekeeping, Estates, IT, Admin, etc) - Services from consultants and contractors - Laundry services - Sterilisation services	3,210.71	6,576.99	7,633.52
Capital Goods	- purchase and installation of capital equipment and infrastructure	2,230.38	2,223.40	3,381.62

TABLE 4: SJH Scope 3 Emissions

SJH's carbon footprint, broken down by scope for the calendar years 2020 to 2022, mirroring the organisation's financial years, is shown in Table 5 below:

	2020 (Baseline yr.)	2021	2022 (Reporting yr.)	% Change since baseline
Scope 1 GHG Emissions (tCO ₂ e/year)	453.03	485.27	447.95	-1.1%
Scope 2 GHG Emissions (tCO ₂ e/year)	258.28	272.59	263.39	+1.9%
Scope 3 GHG Emissions (tCO ₂ e/year)	5,910.16	9,835.73	12,039.82	+104%
Total GHG Emissions (tCO ₂ e/year)	6,621	10,594	12,751	+92%
Total GHG Emissions per patient* (tCO ₂ e/year)	2.15	1.47	1.49	-31%

TABLE 5: SJH Total GHG Emissions and Total GHG Emissions/Patient

*energy consumption per inpatient = approx. 50x energy consumption per outpatient. Per patient calculations have therefore been undertaken using inpatient numbers only.

Emissions Reduction Targets

SJH has set itself the following emissions reduction targets for the next 3 years:

Target (compared to baseline)	2023	2024	2025
Increased % of waste recycled	100%	125%	140%
Reduced gas consumption per patient	525%	550%	600%
Reduced electricity consumption per patient	230%	240%	250%
Reduced Diesel consumption in company vehicles	10%	20%	50%
Total GHG Emissions per patient* (tCO ₂ e/year)	1.40	1.30	1.20

Declaration and Sign Off

This Carbon Reduction Plan has been completed in accordance with PPN 06/21 and associated guidance and reporting standard for Carbon Reduction Plans.

Emissions have been reported and recorded in accordance with the published reporting standard for Carbon Reduction Plans and the GHG Reporting Protocol corporate standard and uses the appropriate Government emission conversion factors for greenhouse gas company reporting.

Scope 1 and Scope 2 emissions have been reported in accordance with SECR requirements, and the required subset of Scope 3 emissions have been reported (where available) in accordance with the published reporting standard for Carbon Reduction Plans and the Corporate Value Chain (Scope 3) Standard.

This Carbon Reduction Plan has been reviewed and signed off by the Hospital's Executive Team.
Signed on behalf of St Joseph's Independent Hospital Ltd:



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Bjorn Rodde

Chief Operating Officer

September 2022

Appendix 1: SJH Carbon Reducing Estates Projects

The following list of projects represents the completed and planned carbon reduction activities associated with the Estate of its site, which represent the majority of SJH's carbon reduction investments. Where projects have been completed, their completion year is written in the right-hand column. Where projects are yet to be completed, the target completion date is written in [square brackets]. The carbon reduction/energy saving aspects are described for each project.

Project Number	Description	Carbon reduction /energy saving	Completion date [Target]
STATUTORY COMPLIANCE PROJECTS			
SC3	Main generator oil tank (HTM and Welsh Gov compliance)	Larger tank capacity reduced delivery frequencies	[2023]
SC5-2	Replace Kitchen roof	Improved and renewed roofing insulation	2022
SC6	Compliant taps/ mixing valves	Accurate and improved water temperature control, reduced hot water demand on boilers	[2024]
SC7A	Main Ward lift Phase 1: Lester Control Panel Replacement	Inverter controls, reducing electricity consumption	[2023]
SC7B	Main Ward Lift refurbishment	Upgrade lift controls and running gear, reducing power consumption	[2023]
SC7C	Reception Lift - Replacement	Obsolete, inefficient, and unreliable technology, reduced power consumption	[2025]
SC10	Fire door replacements - Main Building	Heat loss reduction due to improved door sealing	[2024]

SC13	Staff breakrooms	Installation of zip boilers in centralised locations to remove individual kettles in a larger number of locations, and reduce the number of fridges in use, replacing old inefficient fridges with new, efficient variants	[2023]
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HTM COMPLIANCE PROJECTS

HC1	Med gases plant replacement - (compressors, vac plant and manifolds)	Replace 20+ yr old medical air compressors and vacuum plant, operating at poor levels of efficiency, with efficient, modern plant.	[2024]
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HC2	Main Theatres Refurbishment (Phase 1)	<p>Replace 30+ yr old Air Handling Units and control systems with modern, efficient plant with time-of-day control, EC fans, heat pump capability</p> <p>Replace all taps and thermostatic mixing valves for efficient use of hot water</p> <p>Install LED lighting in place of fluorescent lighting</p> <p>Install new LED operating lamps in place of 20 yr old halogen operating lamps</p> <p>Redesign water pipework configuration and install new lagging to reduce heat loss and increase flow</p>	2021
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HC3-1 **Ward refurb - Rooms (phase 1)**

Re-designed pipework configuration, new pipe lagging, renewed TMVs
 Install air-source heat pumps for individual room heating, allowing main central heating system to be switched off during summer months
 Installation of modern, efficient radiant panels in place of old-fashioned radiators, replace windows and doors with modern double A-rated double glazing replace doors with new well-fitting doors to reduce heat loss/gain
 Replace LCD TV's with modern low energy LED TVs Replace fluorescent room, bedhead and reading lighting with new LED fittings
 Replace bathroom extract fans with modern EC fans and heat recovery
 Replace dated pipe lagging with new lagging with improved thermal efficiency
 Reduce water pipe size to improve hot water circulation and reduce demand on hot water boilers
 Improve accessibility of bathrooms to negate the need for separate assisted bathrooms in addition to the individual room bathrooms

C3-2 **Ward refurb - Rooms (phase 2)**

Re-designed pipework configuration, new pipe lagging, renewed TMVs
 Install air-source heat pumps for individual room heating, allowing main central heating system to be switched off during summer months
 Installation of modern, efficient radiant panels in place of old-fashioned radiators
 Replace windows and doors with modern double A-rated double glazing
 Replace doors with new well-fitting doors to reduce heat loss/gain
 Replace LCD TV's with modern low energy LED TVs
 Replace fluorescent room, bedhead and reading lighting with new LED fittings
 Replace bathroom extract fans with modern EC fans and heat recovery
 Replace dated pipe lagging with new lagging with improved thermal efficiency
 Reduce water pipe size to improve hot water circulation and reduce demand on hot water boilers
 Improve accessibility of bathrooms to negate the need for separate assisted bathrooms in addition to the individual room bathrooms
 Replace out-dated inefficient shower mixers and basin mixer taps

[2022]

HC3-3	St Pats - Assisted Bathroom to Storeroom (1)	Replace pipe lagging New door with improved fitting to reduce heat loss New LED lighting in place of old fluorescent lighting Remove radiator and the demand for heat in the room Reduced wastewater	
HC3-4	St Pats - Wet Room to Storeroom (2)	Replace pipe lagging New door with improved fitting to reduce heat loss New LED lighting in place of old fluorescent lighting Remove radiator and the demand for heat in the room Reduced wastewater	[2022]
HC3-7	St Pats - Toilet Refresh	Replace TMV's Replace mixer tap	[2022]
HC3-8	St Pats - Nurse Office	Removal of bathroom Replace windows Replace pipe lagging	[2022]
HC3-10	St Pats - Nurse Station	Replace fluorescent lighting with LED lighting	[2023]
HC3-11	St Andrews - Sluice Room	Replace windows Replace door New pipe lagging Install radiant panel in place of old-fashioned radiator Install bed pan macerator instead of high temperature bed pan washer	2022
HC4	Main Theatres Refurbishment (Phase 2; UCVs, surgeons' panels, UPS/IPS)	Replace 20+yr old UCV's with modern, energy efficient units Replace LCD surgeon's panel with low energy LED panel	[2023]
HC5	Pharmacy	Relocate to a room with a Fan Coil Unit instead of an Air Conditioning split for temperature control Replace inefficient drug fridge	2022

HC11	Sterile tray store for Theatre inc connection to Recovery AHU	Relocate to a room with a Fan Coil Unit instead of an Air Conditioning split for temperature control Replace doors Replace fluorescent lighting with LED lighting	[2023]
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HC13	New AHU for Clinical Treatment Centre (capacity for 2 treatment rooms)	Replace 15yr old AHU with new, modern, efficient plant with EC fans	[2025]
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CAPITAL PROJECTS

CP1	Day Surgery Unit	Redesign and repurpose former hospice and mortuary to incorporate a modern, energy efficient day surgery theatre, allowing day case surgery to be undertaken in an operating environment that does not utilise ultra clean air supply	2021
CP2	Reboiling and removal of steam generating plant	Outsourcing of sterilisation to a centralised facility, replacing 15yr old steam boilers previously used for sterilisation, hot water and central heating with new high efficiency condensing combination boilers	2022
CP3	Main chillers (Replacement of plant)	Replace 15yr old inefficient main chiller plant with modern efficient equipment, with N+1 capacity for redundancy, reliability, and longevity	2022
CP4	MRI Scanner	Replace old inefficient MRI scanner with new, modern equivalent including new scanner and environmental controls	2020
CP5	New IT switches (core and edge)	Replace all IT switches with modern equipment to improve data handling efficiency. PoE to eliminate need for separate power supplies on end user equipment	2022
CP6	Server Room A/C	Renew A/C unit in server room - like-for-like capacity but more modern, more efficient unit	2021

CP7	Reconfiguration of ESS and Non-ESS electrical circuits	Electrical works to amend circuits to ensure that only essential circuits are powered by the essential supply, removing non-essential circuits from the generator electrical load.	2021
CP8	Server Room UPS	Replace old inefficient unit with modern equivalent	2021
CP8	Fire alarm to be addressable site wide	More reliable and accurate fire detection, more efficient fire alarm panels, less false alarms, and fire brigade callouts	[2024]
CP11	Site wide standby generator	Replacement of 2 existing heavy oil generators with one new, more efficient, larger generator capable of powering all essential systems on site. Reducing maintenance, test runs and fuel usage	[2028]
CP14	LED lighting upgrade (internal and external)	Replacement of all fluorescent and halogen building lighting internally and externally in all buildings on the hospital site.	[2023]
CP16	Move data to Cloud	Switch from local hosting of data to centralised data centre hosting, removing old, inefficient, and slow data storage equipment	2021
CP23	Main car park lighting	Replace old halogen lighting on timer control with photo-sensitive LED lighting on zoned motion sensor control	[2024]
CP24	St Andrews Air Source Heat Pumps	Dual fuel capability, elimination of the need for mobile air conditioning units to be located in multiple locations in the hospital in summer months, the ability to heat individual patient rooms in the summer months via air source heat pump, allowing central heating CT circuit to be switched off.	[2023]
CP26	Drop-off/pick-up points	Dedicated places for drop-off/pick-up to remove congestion/traffic jams, reducing time spent on site by vehicles and reducing carbon emissions	2021
CP25	SurgiCube	Redesign and repurpose former HSDU department into SurgiCube operating facility, creating a low-energy laminar flow environment dedicated to ophthalmic surgery. Repurposing HSDU supply AHU with new EC fans and heater battery. Remove former HSDU extract AHU.	2022

CP27	Cafe Fit Out (Salad bar, display fridge, new furniture, revised layout)	Revised layout to use only one door (reducing heat loss and heat gain), more efficient fridge and display units	[2023]
CP28	Office space reconfigurations	Review of office space allocation to ensure efficient use of space	[2024]
CP29	Fluoroscopy	Upgraded fluoroscopy suite, including replacement of fluoroscopy machine with better energy efficiency	2022
CP30	Re-lagging of Physio building air plant	Lagging is old, degraded and severely damaged by birds; replacement with bird-proof lagging to improve AHU thermal and operating efficiency	[2024]
CP31	Physio atrium glass seal replacement	Reduction of heat loss from atrium glass roof	[2022]
CP32	Ventilation system for pool plant room	Removal of excess heat from Pool plant room, allowing more efficient operation of the boilers	2022
CP33	Electric vehicle charging points	Installation of charging points for EVs parked on site, promoting more efficient travel to/from the hospital	[2023]
CP34	Site-wide energy saving plan and reviewed energy strategy	Review of site energy plan and Hospital energy policy in light of the introduction of new technologies and the changing energy markets	[2023]
CP35	Controllers for BMS panels and development of BMS systems	Upgrade BMS controllers to allow control of additional plant via the BMS systems, more efficient control systems, and more efficient use of energy, upgrade BMS software	[2023]
CP37	Recycling and relocation of Waste Compound	Re-classification of clinical waste streams (post-covid) to reduce incinerated (rather than treated) waste volumes, re-introduction of site-wide recycling; zero to landfill by end of 2022. Bulk waste items (defective/surplus equipment) is either donated overseas or sent for recycling.	[2022]

CP38	Reconfiguration of hot water pipework from main plant room to DSU (CT pipework) and reduction of main pipe sizing	Modification of Constant Temperature system in main building to allow hot water supply to the DSU AHU without the requirement for the CT circuit to be live in the remainder of the main building. Reduce hot water main pipe size from 67mm to 38mm to increase flow, reduce heat loss, maintain temperature in the system and reduce load on boilers. Install new pipework lagging.	[2023]
CP39	Replace defective pipework from Ambulatory Care, Chilled, to Endoscopy (Very poor condition, isolated).	Replacement of unserviceable (leaking) pipework for chilled water supply to Ambulatory care and Endoscopy. This circuit has previously been isolated, requiring mobile (temporary) air conditioning to be in use in these locations.	2022
CP40	Thermostatic balancing valves HWS, Theatres.	Installation of new thermostatic mixing/balancing valves in the theatre department for better hot water management, improved hot water circuit efficiency and reduced demand on boilers	2022
CP41	Gas manifold for pool	Replace gas supply manifold to a different design to improve the efficiency of the boilers for the pool	2022
CP44	Solar PV to be introduced site wide to offset energy costs and carbon footprint	Installation of PV panels on flat roofs to reduce Hospital demand on the grid, installation of covered parking utilising PV panel canopies	[2023]
CP48	FD60 storage cupboards (Diagnostics, ward, main stair well, physio building)	Creation of fireproof storage cupboards to improve efficiency of space utilisation in the Hospital, reducing the requirement for building extension works	2022
CP55	Reviewed and improved Preventative/Planned Maintenance schedules	Significantly improved Hospital Estates PPM programme to ensure a well-maintained Hospital, reducing the required frequency for major works and extending the lifecycle of plant/equipment	[2023]
CP57	Access and Egress ladder and hand rails on main rooftops	Improved personnel access to specific roof tops to remove the requirement for the use of scissor lifts and mewps on site.	2022
CP59	Wellbeing Garden	Creation of an outdoor staff garden to reduce the need for indoor staff rooms and improve staff wellbeing and productivity	2022

CP61	Outpatient Building hot water boilers	Replace 30-year-old hot water boilers in the outpatient building with modern, efficient alternative, upgrade to more efficient inverter driven water pumps, new valves/pipework, install new lagging	2021
CP62	Outpatient Building central heating boilers	Replace 30-year-old central heating boilers in the outpatient building with modern, efficient condensing boilers, upgrade to more efficient water pumps and pipework, install new lagging	[2024]
CP63	Pool cover	Install hydrotherapy pool insulating cover to reduce heat loss out of hours and significantly reduce energy consumed	2022
CP64	Re-roofing works to main building	Replace flat roof covering and insulation prior to major developments such as new AHUs and solar PV located on the hospital roof. Insulation thickness maximised in every instance	[2023]
CP65	Solar film in DSU	Solar control/ privacy film installed on Day Surgery Unit bedrooms to reduce solar thermal gain and the corresponding summer cooling requirement	2021
CP66	UPS/ IPS electrical switch rooms cooling	Room cooling design incorporates bespoke fresh air first, active cooling second approach	[2023]
CP67	Pool heat recovery	Heat recovery and dehumidification of hydrotherapy pool room	[2025]
CP68	Cardboard Recycling in Stores	Introduce bailing system to create cardboard bails for recycling from main stores	2020