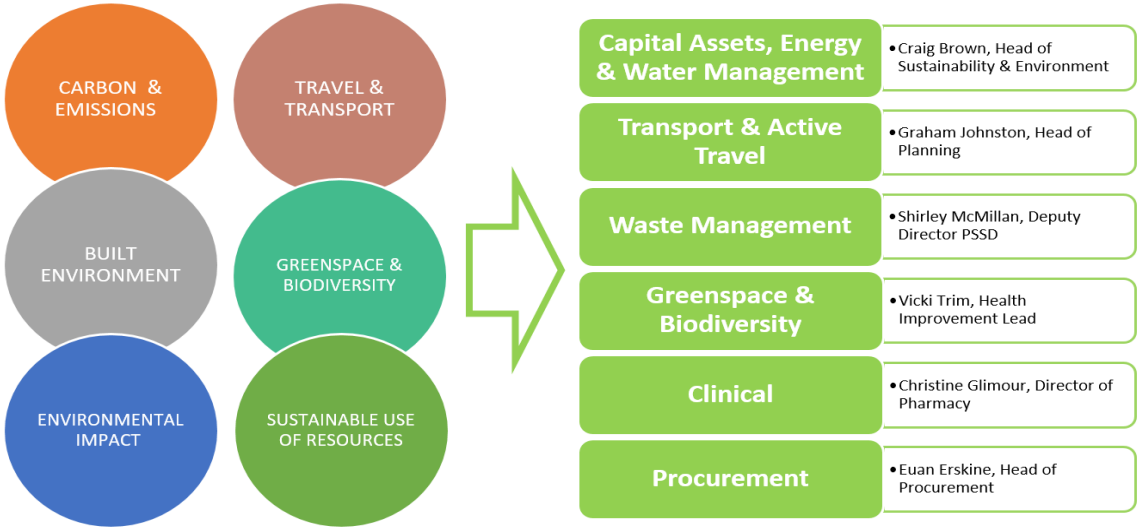
SUSTAINABILITY AND CLIMATE CHANGE
OUR ROAD TO NET ZERO
Board Update - August 2023

1. Introduction

We have made good progress since the publication of our Sustainability and Climate Change Strategy - *Our Road to Net-Zero and Sustainable Healthcare 2022 – 2026,* which was approved in October 2022.

Through the first half of 2023 we worked to re-engineer our governance structures, identifying leads from across the organisation to ensure we are best placed to deliver the commitments and objectives detailed in our strategy. To underpin this, we established a number of workstreams, each of which has responsibility for a key area of focus:



Over the same period, we have been working with Jacobs to set out our 'Routemap to Net Zero'. This paper highlights the pathway priorities identified in the document (currently in draft), the scale of the challenge facing us, and how our workstream objectives will support delivery.

2. Background

NHS Lanarkshire is obliged to meet decarbonisation targets set by Scottish Government. The most critical targets are

- 75% reduction in emissions by 2030
- decarbonised heat by 2038
- Net Zero by 2040

Based on current reporting we have reduced emissions by 70% vs. the 1990 baseline year and are currently 5% off the 2030 target. Without additional decarbonisation measures we are aware that the Board would narrowly miss the 2030 target and fall substantially short of the 2040 Net Zero target, with 18% of baseline emissions projected to remain.

The 70% emissions reduction achieved to-date value varies from the previously reported figure (74%). This is primarily due to the scope of the route-mapping study incorporating emissions sources which were not previously included in historic emissions tracking. These are likely to include refrigerant gases, medical gases, Fuel and Energy Related Activities (FERA) emissions and business travel.

3. Our Routemap to Net Zero

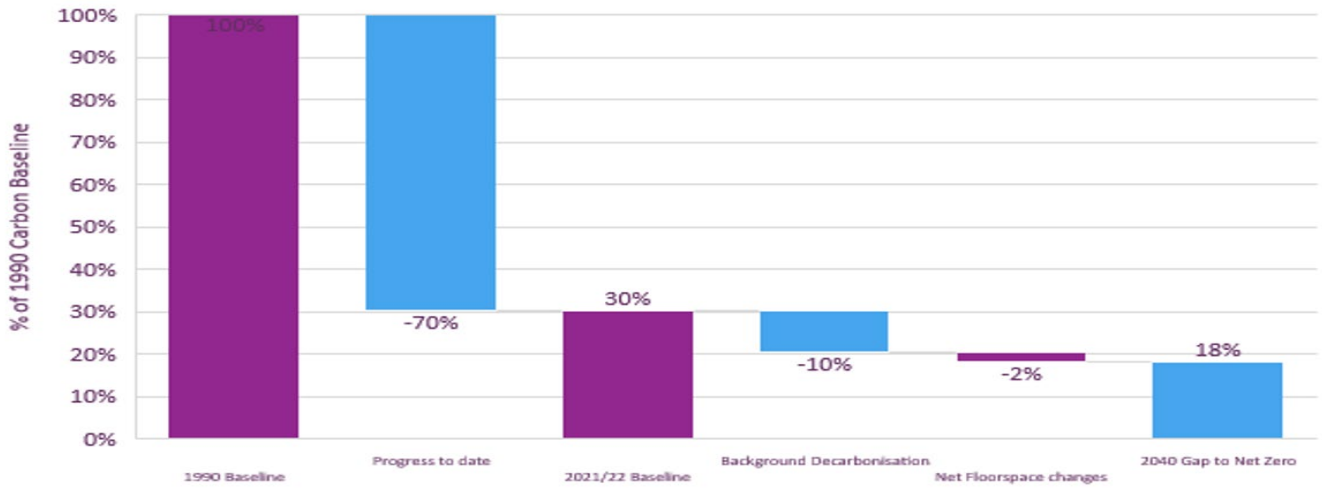
The development of our Net Zero Routemap was supported by Jacobs and is a critical step in establishing the action required to meet NHS Scotland's obligations under The *Climate Change (Emissions Reduction Targets) (Scotland) Act 2019.* The draft document sets out a modelled pathway for NHS Lanarkshire to achieve Net Zero operational emissions target by 2040, utilising established and emerging energy technologies. The statistics and graphs that follow have been derived from the Routemap draft document and are intended to set the context in terms of the current position and journey NHS Lanarkshire are embarking on.

The development of the routemap has been a complex process. It incorporated detailed estates information, data collected during the setting of the carbon baseline and data from surveys of 3 of our sites - University Hospital Wishaw, University Hospital Hairmyers and Hunter Health Centre. These sites were selected as our Acute hospitals are our largest emitters, and were out of scope for parallel energy efficiency work that was already underway as part of the Scottish Governments Green Partnership Energy Efficiency Scheme (GPSEDS)

3.1 NHSL Progress and the Gap to Net Zero

The Routemap details our progress against the carbon baseline set at 1990. Historic data only exists for utilities (e.g. heating fuels and electricity). For the purposes of making an appropriate comparison, it was assumed that the emissions from non-utility sources were the same as in 2021/22. Emissions during this period were almost certainly higher and therefore the relative progress reported is likely to be greater than the *70% reduction* noted below.

Figure 1 – NHSL Gap to Net Zero



.

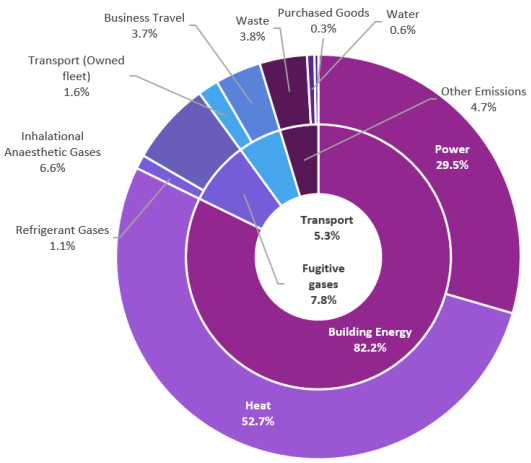
The 70% reduction achieved to date is the result of a range of contributing factors but there are 3 that are particularly significant:

1. Large reduction in the total energy consumption of the built environment.
2. Transition from high-carbon heating fuels like coal and Heavy Fuel Oil (HFO) to predominately natural gas for heating the estate.
3. The significant decarbonisation of grid electricity

3.2 NHSL – Baseline and Business as Usual (BAU) Forecast

NHSL's reported emissions during the 2021/22 baseline were 31,956 tCO2e. The breakdown of the sources of the emissions is noted below with over 82% attributed to building energy.

Figure 2: NHSL Source of Emissions



The top 5 emissions in order of impact are from:

1. Heating buildings; 30%
2. Powering buildings; 53%
3. Fugitive gases from medical gases (and including emissions from refrigerant gases); 8%
4. Transport, our fleet and business travel; 5%
5. Waste; 4%

As most of NHS Lanarkshire's base emissions are attributable to building energy, the decarbonisation measures deployed in this area are critical drivers of change in the routemap trajectory when compared to BAU. Responsibility for leading on this key element of our Sustainability Strategy rests with our Capital Assets, Energy & Water Management workstream, led by our newly appointed our Head of Sustainability who is working closely with PSSD leads and external partners in this area.

A review our estates shows that our 3 acute hospitals contribute circa 68% of the Board's total emissions. In addition to being the fourth largest consumer at 7.5%, the West of Scotland Laundry has, by far the highest emissions per m2 of floor space. Coathill Hospital, Kirklands Hospital and Hunter Health Centre contribute 6.7% of emissions with the remaining 17.9% of emissions arising from our community healthcare and corporate office properties.

Figure 3- Emissions by Site

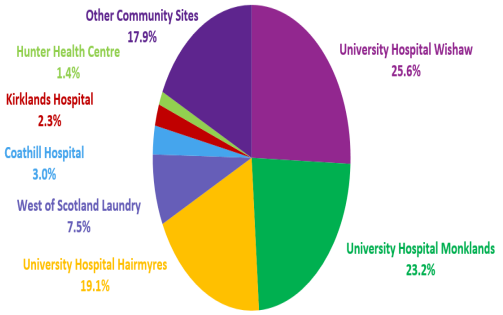
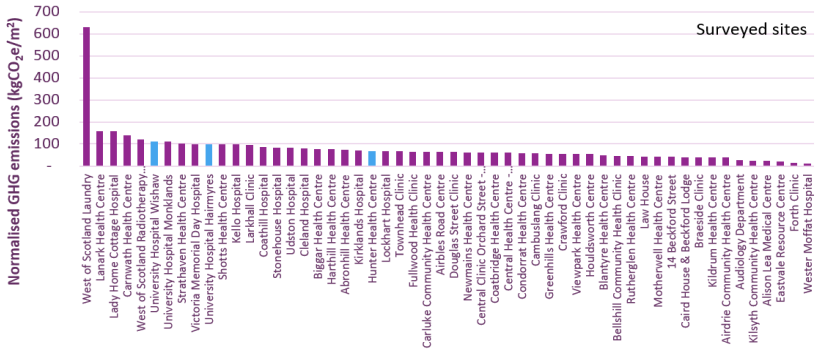


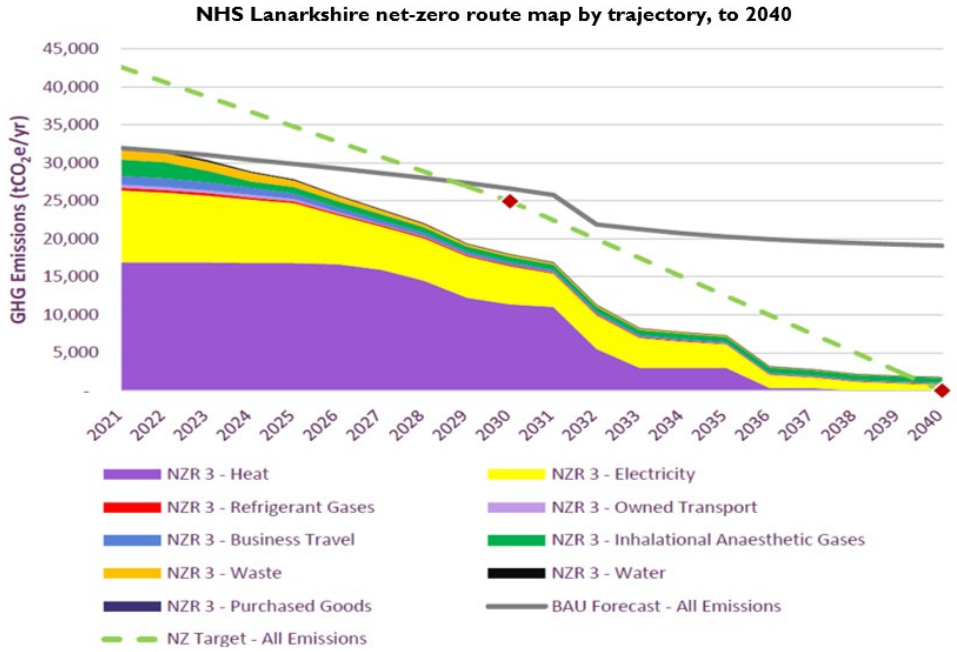
Figure 4: 2021/22 Normalised Emissions by Site (kgCO2e/m2)



In addition to quantifying NHS Lanarkshire's carbon baseline, Jacobs have projected emissions forward to 2040 (NHS Scotland's target date for reaching Net Zero Carbon). The forecast is based on a BAU scenario and assumes underlying demand for resource does not change. Background decarbonisation is considered, including but not limited to, grid decarbonisation and our transition to electric vehicles. The BAU scenario also takes into account known changes to the Board's estate, for example, the re-provision of Monklands Hospital in 2031. It is clear from the trajectory noted below, that without taking targeted action, there will be a significant gap to reaching the Net Zero 2040 target. The trajectory to 2040, accounts for in-scope emissions and compares to the BAU forecast with NHS Scotland targets. As a significant proportion of our baseline emissions are attributed to building energy, as already noted, it is decarbonisation measures deployed in this area that will be a critical driver of change. There are, however, a number

of known risks at this time which include the capacity of the grid and, in the absence of a change to pricing structures, significantly higher utility costs as we transition from gas to electricity.

Figure 5 Net Zero Routemap trajectory to 2040



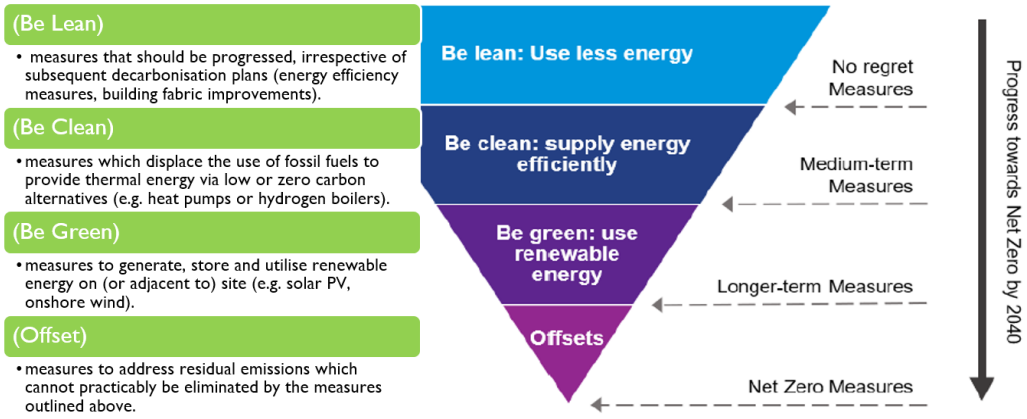
The info above demonstrates that the BAU forecast for NHS Lanarkshire's 2030 target of a 75% reduction in carbon emissions will be narrowly missed, while the BAU projection for 2040 is forecasted to miss the net-zero target by 20000tCO. There is clearly a significant amount of work for us to progress and investment required to ensure the Board meets our obligations in this respect.

In all modelled pathways identified as part of the route-mapping work, decarbonisation measures will not fully eliminate emissions. Carbon offsetting certificates will also need to be procured for any residual emissions in 2040.

3.3 Decarbonisation Interventions

Decarbonisation interventions outlined in the draft Net Zero Routemap are categorised according to the emission source they pertain to (e.g. transport, waste etc.) The exception to this is energy-related measures, which are generally categorised within one of the following groups:

Figure 6: Energy Related Decarbonisation Measures



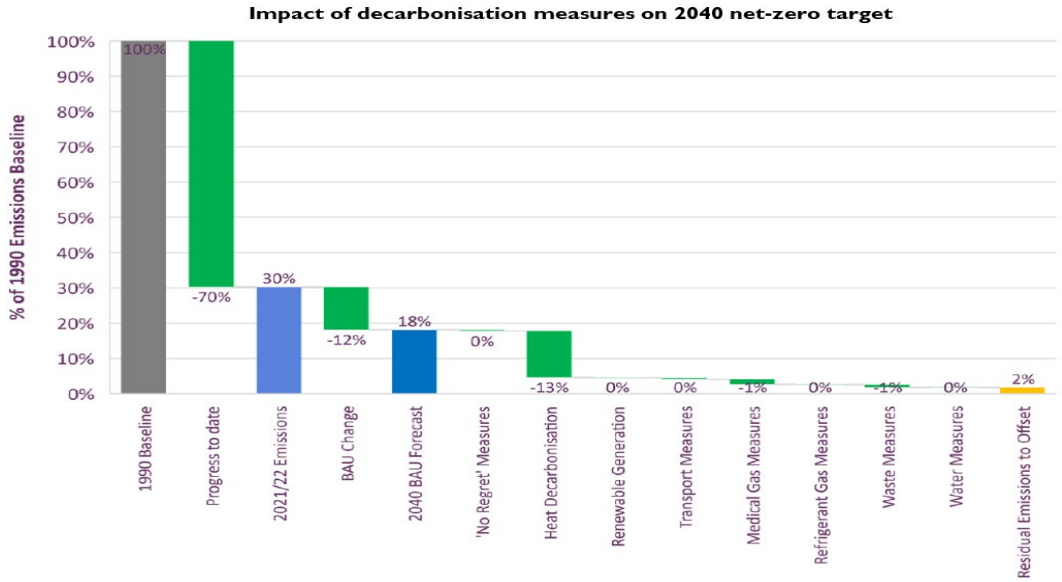
Implementation of the following measures will have the largest impact on reducing NHS Lanarkshire's carbon emissions:

Table 1 Decarbonisation measures that will reduce NHS Lanarkshire's carbon emissions

Energy Conservation Measures	1. 'No Regret' energy conservations measures including the upgrade of old light fitting to LEDs (with smart controls where appropriate), upgrade of obsolete Building Energy Management Systems (BEMS)
	2. Implementation of a programme of building fabric improvement works to improve thermal performance of older building stock by upgrading window glazing, improving draught-proofing, and insulating walls and rooves.
Energy Optimisation	3. Hardware and optimisation of control using analytics software, and the replacement of old air handling units (AHU) fans with electrically commutated (EC) fans.
	4. Implementation of private wire power purchase agreements (PPAs) to supply significant volumes of renewable power to acute sites (including UHH, UHW and UHM) via large-scale offsite solar PV arrays.
Installation of Renewables	5. Rapid installation of smaller rooftop or car park solar PV systems in throughout community sites.
Decarbonisation of Heat	6. Discontinuation of the use of combined heat and power (CHP) for the provision of thermal and electrical energy at UHW.
	7. Wide scale adoption of air source heat pumps (ASHPs) to replace gas boilers throughout the built environment.
	8. Replacement of gas oil with hydro-treated vegetable oil (HVO) in back-up generators and as boiler back-up fuel.
	9. Utilisation of heat networks as part of a heat decarbonisation plan through collaboration with e.g. the council.
Medical Gas Reduction	9. Implementation of a N_2O and Entonox waste reduction programme.
Decarbonisation of Transport	10. Transition of remaining petrol/diesel fleet vehicles to battery electric vehicles (BEVs) and an increased investment in EV charge points to support the transition.

Implementation of these measures is forecasted to reduce NHS Lanarkshire's carbon emissions down to 2% of the 1990 baseline by 2040, the remaining 2% residual emissions would require offsetting to achieve net-zero; as outlined in the graph below.

Figure 7: Impact of decarbonisation measures against the 2040 net-zero target.



3.4 Risks and Barriers

As part of the Net Zero Routemap work Jacobs have identified a number of barriers to achieving net zero. Much of this relates to resource (funding and people), capability and infrastructure, which combined presents a significant risk to achieving the 2040 target.

- ***Resources, skills and capability**:* The responsibility for the delivery of decarbonisation currently falls to a very small, localised sustainability team who are already working at capacity.
- ***Finance and funding**:*
    - Decarbonisation requires significant and long-term investment.
    - The existing national accounting rules present a challenge for projects of a complex nature and is a significant barrier to large scale decarbonisation financing.
    - Current financial sign-off favours rapid financial return on investment meaning the decarbonisation projects which have a more substantial impact at greater expense are less likely to be approved.

- ***Data Management and Analysis**:* A lack of available data to enable the development of accurate and effective decarbonisation plans presents a technical barrier to achieving Net Zero.
- ***Governance**:* Due to the number of sites and the number of deliverables, robust governance processes will be required to address the scale of the challenge.
- ***Potential Delivery Models**:* Several different delivery and implementation models will be necessary to enable efficient decarbonisation.
- ***Enhancing Knowledge Exchange:*** Enhancement of knowledge exchange is necessary. Limited capacity within centrally located teams poses as a barrier to knowledge sharing.
- ***Decision-making and approvals:*** Complexities in the project sign off process may inhibit on-site activity, delaying the completion of project deliverables.
- ***Delivering at pace:*** To enable decarbonisation delivery at scale, a streamlined approach to delivery must be adopted, minimising the necessity for escalation of project sign-off to senior sponsors.
- ***Prioritisation:*** Competing pressures make it difficult for key decision makers to prioritise the attainment of their Net Zero commitments at present.

In addition to those noted above the Board has first-hand experience of the limitations of the grid capacity and the work being carried out nationally is equally as critical to ensure that capacity exists to support a transition away from fossil fuels.

4. NHSL – Decarbonisation Transformation Plans

It is reassuring to note that the strategic aspirations detailed in our strategy document correlate closely with the more detailed pathway output within our draft Net Zero Routemap. There has been a significant focus on energy efficiency over the last year resulting in a capital funding application submission totalling £5million for energy efficiency and carbon reduction measures made at the end of July 2023. This application has been made under the Green Public Sector Estates Decarbonisation scheme and aims to target Solar PV, BMS upgrades, insulation and heat recovery projects, i.e. the 'No Regret' measures detailed above. We continue to wait for the outcome of this bid.

To further bolster capacity with a degree of expertise in sustainability, additional resource has been sourced through 2 x Sustainability Interns who will start in early September for a 16 week period. They will be focused on 2 specific areas of work, waste and communications. If successful, it is intended that we will continue to host interns regularly moving forward.

Our workstreams have been focused on identifying a series of objectives for the coming year based on the clear objectives detailed in our strategy.

4.1 Capital Assets, Energy & Water Management

OBJECTIVES FOR YEAR 0 (2023/24) – MOBILISATION RAG status

Implementation of the Sustainability & Climate Change Strategy

Objectives	Key Outputs
1. Identify Route to Net Zero to achieve 2040 target 2. Identify & Apply for Funding Opportunities for Energy & Water Upgrades 3. Implement Energy Conservation Measures to achieve net zero by 2040 4. Energy Data QI - Improve the quantity & quality of energy data available to inform more robust energy reporting to improve the measurement of GHG and the visibility of reporting.	1. Net Zero Route Maps Mott MacDonald Pre-capital report/ Jacobs Route Map to Net Zero 2. Application to GPSEDs funding 3. Implementation of energy conservation measures 1. NDEE Framework Application/ Full Business Case/ BMS, Solar PV, LED, heat recovery upgrades to WoSL. 4. Installation of automatic electricity metering 5. Stakeholder Energy Reports

Progress Update

- ***GPSEDS Capital Application 2023/24*** **-** Funding has been applied for implementation of energy conservation measures at Airdrie Health Centre, Coathill Hospital, Kirklands Hospital, Udston Hospital and at the West of Scotland Laundry in 2024. The decarbonisation measures and project outcomes are outlined below:

Decarbonisation Measure
Solar PV
Double Glazing
Roof Insulation
Draught Proofing
WoSL Heat Recovery
BMS Optimisation
Sub-Total
VAT & Contingency (12.5%)
Total

Project Outcomes

- Estimated annual energy consumption savings **= 2,242,402 kWh pa**
- Estimated blended useful life of measures (years): **27yrs**
- Estimated annual CO_2 savings tCO2e: **= 451 tCO2 pa**
- Estimated annual energy cost savings: **= £176,286 pa**

- **GPSEDS Pre-Capital Application 4-** In addition, an application for pre-capital funding of £60,000 was also submitted in July 2023 through the GPSED's scheme. t=This will fund building energy audits at: Airbles Road Health Centre, Motherwell Health Centre, Carluke Community Centre, Coatbridge Health Centre and Cleland Hospital.

4.2 Transport & Active Travel

Objectives for Year 0 (2023/24) – Mobilisation RAG status

Objectives	Key Outputs
1. Assess and review our approach to transport recognising the requirement to utilise low emission options and demonstrate reductions in greenhouse gas emissions. 2. Promote use of technologies to minimise travel. 3. Continue to develop NHS Lanarkshire Transport Hub, and partnerships with Community Transport Providers. 4. Continue the process to transition our commercial fleet to fully electric vehicles. 5. Develop programme for creation of site Green Travel Plans for our major sites. 6. Increase promotion of active travel options – car share, walking, cycle to work.	1. Reintroduce monitoring of business travel mileage 2. Improved access to active travel options. 3. Increased use of NHS Lanarkshire Transport Hub. 4. Reduced emissions for commercial fleet.

Progress Update

- Electronic Vehicle (EV) replacement programme for light fleet vehicles in place which will be fully realised by 2025.

- Secure bike storage installation has been completed at Airbles Road centre, Bellshill CHC, Blantyre HC, Carluke CHC, Lanark HC and Motherwell HC. This brings the total number of sites to 7. Further sites are being considered and funding applications have been made.

- Travel data is being reviewed and consideration is being given to working with a specialised travel consultancy to maximise impact.

4.3 Waste Management

OBJECTIVES FOR YEAR 0 (2023/24) – MOBILISATION RAG status

Objectives	Key Outputs
1. Reduce Clinical Waste by 5% 2. PET Plastics Segregation Project 3. Implementation of Deposit Return Scheme in accordance with SG target of March 2024 4. Develop NHSL Waste Management Policy by September 2023	1. Compliance with waste regulations 2. Effective Monitoring and performance with waste functions. 3. Duty of Care Waste Management Audits across 3 acute sites and community sites.

5. NHSL Waste Management Officer to complete Level 5 Healthcare Waste Management Certificate by March 2024 6. Establish business case and secure funding for Neptune waste management system at PFI sites by October 2024 7. Implementation of Segregation of Persistent Organic Pollutants Waste Streams (POPs) by June 2023 to comply with waste classification requirements.	4. Raise awareness of impact of waste on health and the environment 5. Roll out waste management training and waste management campaigns.

Progress Update

- 20% of annual waste management audits have been completed in year to date.
- Implementation of plastic segregation project has begun.
- Waste specific learn pro modules have been signed off and will be ready for use shortly.

4.4 Greenspace & Biodiversity

OBJECTIVES FOR YEAR 0 (2023/24) – MOBILISATION RAG status

Objectives	Key Outputs
1. Assess the extent and quality of our greenspace, and take actions to improve the contribution our estate makes to biodiversity 2. Manage our greenspace to increase provision and improve access, quality and regular use by staff, service users, and the local community 3. Collaborate with our local partners to improve the natural links between NHS greenspace and other local areas of greenspace 4. Increase NHSL's contribution to tackling the ecological emergency and restoring biodiversity 5. Tackle Climate Change and Health inequalities in tandem and engage Community Planning Partnerships	1. Refresh of Green Health Partnership (LGHP) Action plan for 2023-2026 2. Communications plan 3. Health Promoting Health Service (HPHS) principles and outcomes aligned to realistic medicine and Outcome 4. Staff Health & Wellbeing 5. Transforming the Hospital Environment (Acute sites) 6. Lanarkshire Weight Management Service community programme of work encompassing green health offerings

Progress Update

- The community hospital gardening groups continue to meet over 6 sites, and further referrals from health and social care staff are encouraged through the green health page on the NHSL website.

- Seating has been provided at an outdoor area on site at UHM, and discussions are ongoing on how to develop existing external areas.

- The LGHP held a successful workshop in July to discuss the next strategy and action plan. The sustainability team attended this to ensure a strong tie between green health, biodiversity and the wider sustainability agenda.

- A working group has also been created to look at further developments for the King George V garden at UHW.

4.5 Clinical

OBJECTIVES FOR YEAR 0 (2023/24) – MOBILISATION RAG status 

Objectives	**Key Outputs**
1. To reduce the carbon footprint/emissions of theatres across NHS Lanarkshire via implementation of the National Green Theatres Programme (NGTP) actions bundles. 2. Share good practice and learning between departments/areas and expand green theatres approach to other clinical areas. 3. Promote the link between good environmental stewardship and quality care provision. 4. Establish a green ward group	Green Theatres – delivery of bundle A from National Green Theatre Programme: • Elimination of Desflurane (anaesthetic gases): now off national procurement list • Nitrous Oxide manifold decommissioning: Estates & Facilities depts. – ongoing • Heating Ventilation & Air Conditioning/ Anaesthetic Gas Scavenging System setback: Estates & Facilities depts. – ongoing • Surgical Suction Devices (Neptune): Facilities & Theatres depts. • IV to oral paracetamol: Anaesthesia depts.

Progress Update

- Clinical lead identified
- Review and refresh of Green Theatre Group including expansion of membership to focus on delivery
- Desflurane fully phased out of use in NHSL theatres
- Nitrox Oxide Manifold decommissioning completed in July 2023
- PSSD undertaking a series of sites surveys to scope any capital upgrade implications and costs associated with system setback and surgical suction

5. Summary & Next Steps

Significant progress has been made by our Sustainability and Environment Group and associated workstreams since the approval of our strategy in October 2022 and the refresh of our governance arrangements, resulting in a complete refresh of group membership in the first quarter of 2023.

Our small sustainability team are currently working with workstream leads to establish KPIs and firm up on programmes of work related to the output of the Route-mapping Exercise. It is a key ambition that we take this agenda

into the whole organisation and we are currently developing a communication strategy that will underpin the work of the group and ensure maximum exposure across NHSL. We also continue to work with Mott MacDonald to implement the capital upgrades identified that will delivery improved energy efficiency and support a reduction in emissions across a number of our sites.

Appendix 1 – Scope Definitions