South East Coast Ambulance Service NHS
NHS Foundation Trust

Green Plan

2023 to 2026

Foreword

Why Net Zero Action, Why Now?

Here at South East Coast Ambulance Service NHS Foundation Trust, we have set ourselves an ambitious target to reduce our carbon emissions by 80 per cent over the next decade and to become net zero by 2040.

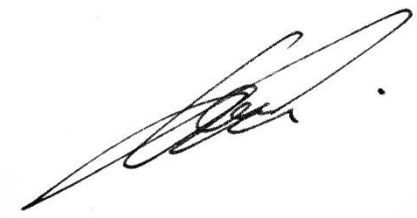
We are proud to present our Green Plan, which is our response to this ambition and sets out how our organisation will achieve net zero and champion sustainable growth over the next two decades.

The key objective of this important document is to share the integrated net zero roadmap, key milestones and near-term interventions to accelerate the reduction of our carbon footprint, with a view to mobilise and secure support from our key stakeholders.

We hope that this plan empowers our colleagues and system partners to understand the critical role we all have to play in delivering success. We want to encourage everyone to find opportunities to collaborate and improve our Trust's and the wider NHS' sustainability performance across our Medicines, Fleet and Estate functions.

We also aim to involve and collaborate with our colleagues in our efforts to reduce waste, which is one of the key pillars of our overarching Green Strategy. This Green Plan supports the Green Strategy, which was approved by the Board in January 2022 and ambitiously mirrors the NHS-wide aim to become the world's first net zero healthcare system.

Alongside these documents, our colleagues have established the new Green Staff Network, which will champion and support our ambition to become an ethical and environmentally responsible Ambulance Service. I look forward to working closely with the Network to support our SECAmb colleagues to make a positive impact on our sustainability.



David Ruiz-Celada

Executive Director of Strategic Planning and Transformation

Contents

Executive Summary

This report has been commissioned by South East Coast Ambulance Service (SECAmb) following the approval of SECAmb's Green Strategy by the Executive Board in January 2022. Aligning to the NHS' Decarbonisation Strategy, SECAmb is aiming to achieve net zero carbon emissions by 2040 for emissions we directly control, and 2045 for emissions under our indirect control (such as those within our supply chain). This Green Plan articulates the combined roadmap to net zero for directly controlled emissions, demonstrating how SECAmb is supporting the NHS-wide ambition to become the world's first healthcare system to reach net zero carbon emissions and secure our future. SECAmb will consider our indirect emissions, also referred to by the NHS as Carbon Footprint Plus, at a later date.

In *Delivering a 'Net Zero' National Health Service*, the NHS defines two key targets:

- **NHS Carbon Footprint:** Net Zero 2040 for the emissions the NHS controls directly, with an ambition to achieve an 80% reduction by 2028 to 2032 compared to a 1990 baseline.
- **NHS Carbon Footprint Plus:** Net Zero 2045 for the emissions the NHS has the ability to influence, with an ambition to achieve an 80% reduction by 2036 to 2039 compared to a 1990 baseline.

This Green Plan has been developed to address the NHS Carbon Footprint targets, and presents the combined roadmap to Net Zero 2040 for the relevant emission scopes. It sets out SECAmb's emissions baseline; the plans and actions that will take place over the next three years; monitoring and reporting methodology; resource implications; and investment profile. The Carbon Footprint Plus targets will be addressed separately in future Plans.

To ensure SECAmb is on track to achieve these targets, we have set our own targets against our 2019/20 baseline and in line with the Paris Agreement:

- *SECAmb has set a tentative near-term target of **50% emissions reduction by 2028-2032**, in line with the Paris Agreement's recommendation to halve emissions by 2030.*
- *SECAmb is committed to achieving **net zero emissions by 2040.***

Using detailed modelling, the Green Plan presents an optimised trajectory to 2040 and a detailed programme of works up to 2026. These are based on estimates, and will be revised and refined in future iterations of the Plan.

Carbon Footprint

In order to understand how to achieve net zero, we first need to understand our current carbon footprint. An emissions baseline was calculated using consumption data from financial year 2019/20, and includes emissions from our vehicle fleet, energy consumption across our estate, the use of medicines, and more.

Our baseline emissions have been calculated at **14,778 tCO_2e**. Over half of these emissions are the result of our fleet operations. Dual Crew Ambulances (DCAs) make up the largest proportion of our operational fleet and contribute 63% of our total fleet emissions.

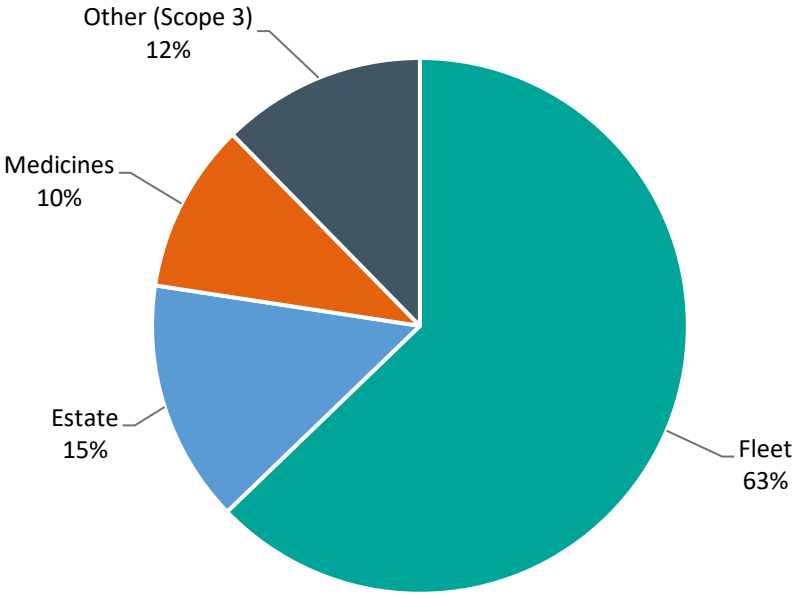


Figure 1 Emissions by source

Our estate is responsible for 15% of our total emissions. This is based on electricity and gas usage, which is influenced by building efficiency and occupant behaviour. Of 110 sites, over half of the emissions produced by the estate in 2019/20 were emitted by just ten sites, the majority of which were Make Ready Centres. These sites often have the poorest energy efficiency, both due to operational needs and building components, and these inefficiencies need to be addressed in order to reduce our footprint.

'Medicines' refers to the emissions resulting from the use of Entonox. Nitrous oxide, a key component of Entonox, has a high global warming potential, and it is difficult to control the fugitive emissions that result from its use. Analysis of SECAmb's Entonox consumption has highlighted inefficiencies within our track & trace system that result in consistent overspending and overstocking of medical gases. Addressing the root of this issue will be essential in reducing our medical emissions.

The emission profile below has been developed using our new carbon budget tool. The tool gives SECAmb access to up-to-date scenario modelling, and in turn provides the most optimum route to net zero.

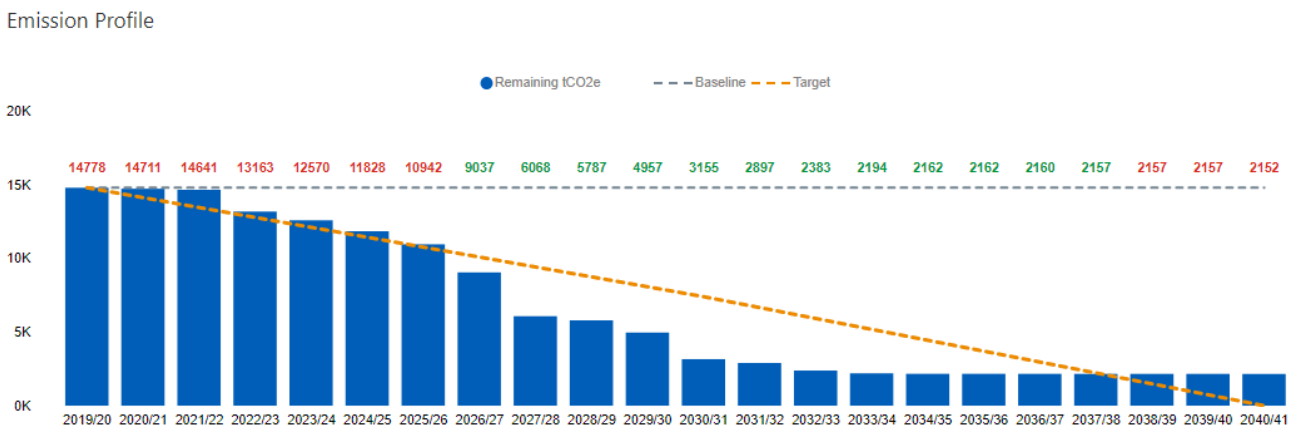


Figure 2 SECAmb's decarbonisation trajectory

To deliver our net zero targets, significant investments will be required. The chart below illustrates the annual investments that will be made over the next three years to implement the carbon reduction measures that have been identified. The total investment required over the next three years is estimated to be around £3.7 million.

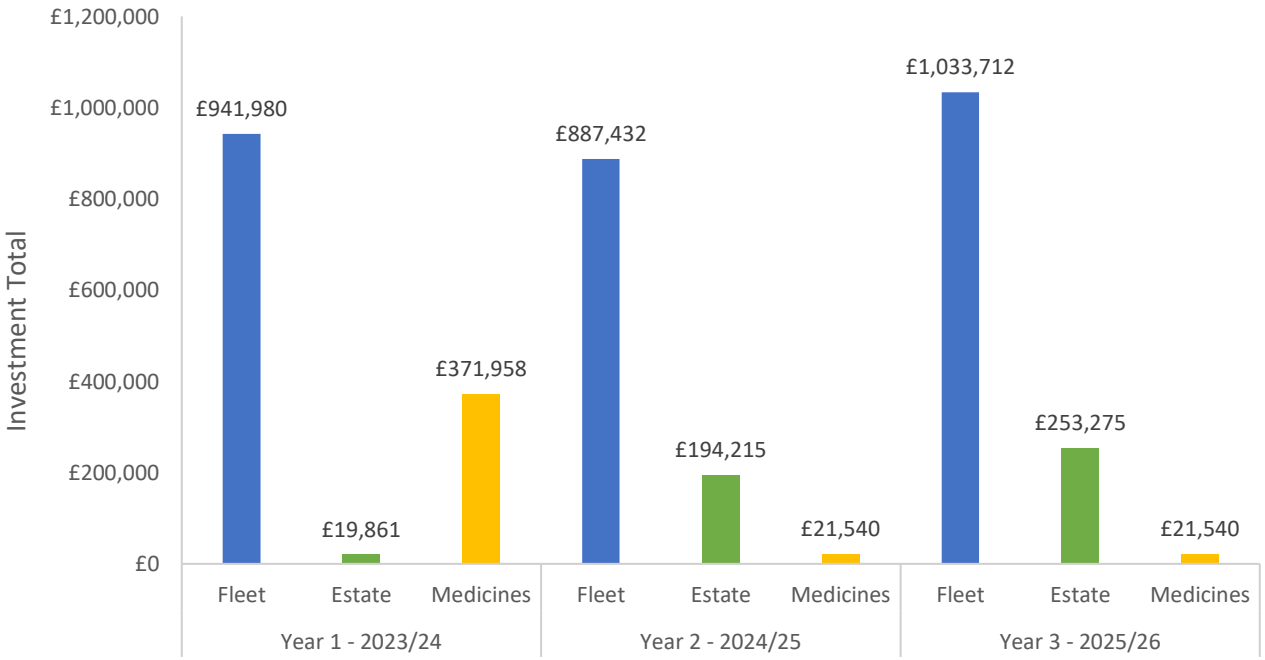


Figure 3 Total estimated investment required over the next three years

We are also committed to carrying out at least one Green Staff Network initiative per year. The level of investment required for this is yet to be determined. With this in mind, the estimated annual spend on net zero projects over the next three years is as follows:

- Year 1 - 2023/2024: £1,333,799
- Year 2 – 2024/2025: £1,103,187
- Year 3 – 2025/2026: £1,308,527

Next Steps

In addition to the initiatives established in this visual, the Green Plan recommends that a dedicated Sustainability Team be established. This team would serve two distinct functions: to drive change and mobilise our people and system partners on the ground, and to monitor and report on the impacts of decarbonisation initiatives. Using a data-driven approach will allow them to assess and communicate the results of each programme and quickly adapt to any barriers they may face.

A series of key interventions have been identified to be carried out over the next three years and are defined in the table below. A comprehensive timeline of these interventions has also been provided, demonstrating the priority actions needed.

Intervention	Workstream	Timeframe	Estimated emissions reduction (tCO_2e)	Carbon footprint after implementation (tCO_2e)
Deliver replacement targets	Fleet	2023-26	2,342	12,330
Deliver EVCI targets	Fleet	2023-26	0	12,330
Deliver Estate retrofit interventions	Estate	2023-26	1,099	11,231
Transfer to green energy	Estate	2023	838	10,393
Procure app & reduce Entonox usage	Medicines	2023-26	700	9,693
One Green Staff Network intervention each year	Green Network	2023-26	To Be Determined	To Be Determined

Table 1 Summary of proposed projects and initiatives for the next 3 years to meet reduction targets

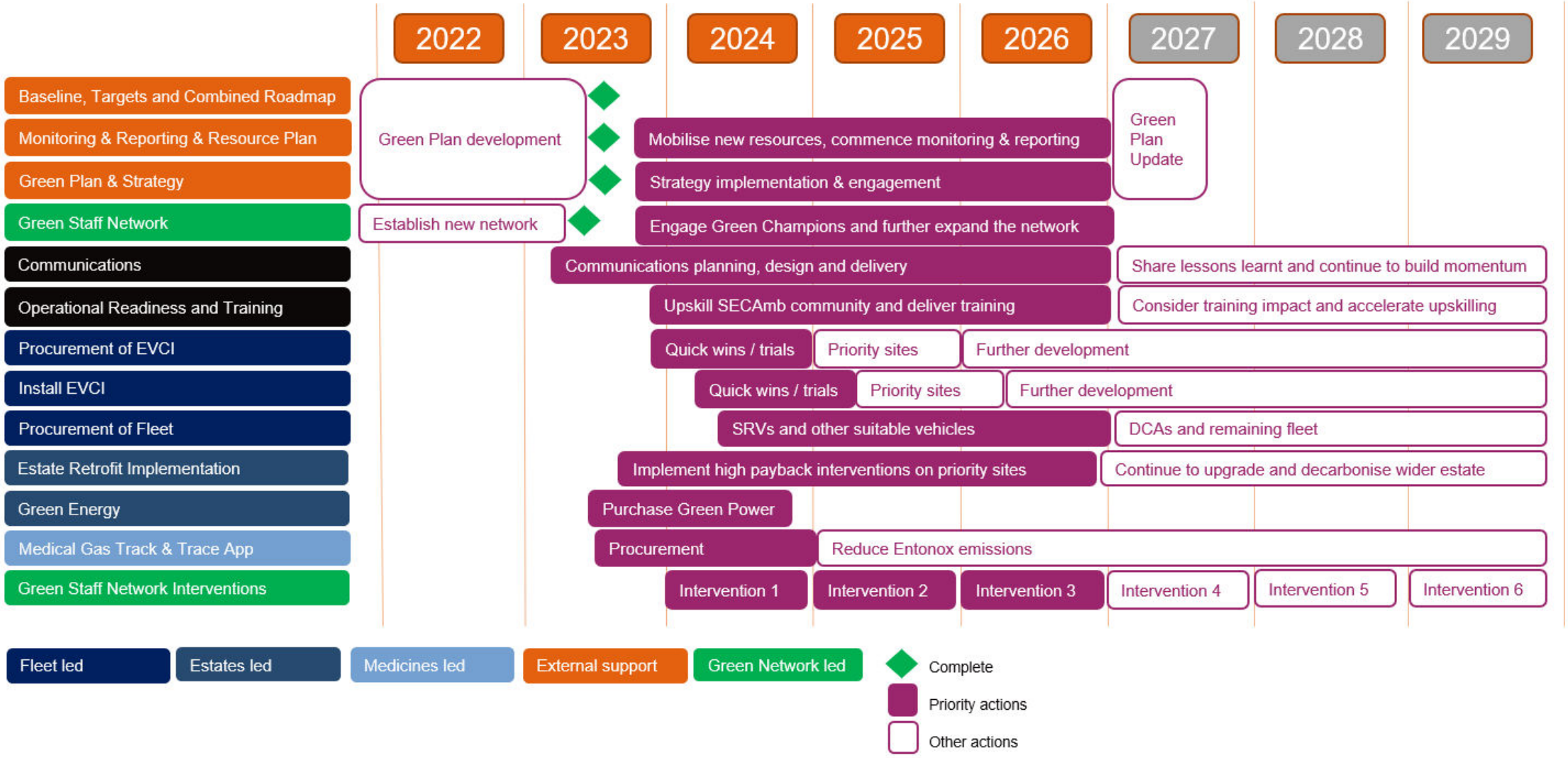


Figure 4 Delivery Roadmap 2023-2026

1 Introduction

The South East Coast Ambulance Service (SECAmb) is continuously striving to improve and deliver compassionate, sustainable healthcare. With over 4,000 staff working across 110 sites, we serve a community spanning 3,600 square miles, from densely populated urban areas to sparse rural areas. The Trust is made up of 90% operational staff, providing either face-to-face patient care or receiving calls at our emergency dispatch centre, as well as operating the NHS 111 service across the region.

4,000
staff

110
sites

across
3,600
square
miles

Our patients range from the critically ill who requiring specialist treatment, to those with minor healthcare needs who can be treated at home. Our key services include:

- Emergency ambulance response in life threatening situations,
- Critical care paramedics providing treatment on scene,
- Paramedic practitioners providing treatment in home for minor injuries,
- Clinical advice provided over the phone by a nurse or paramedic,
- Working with our partners to provide referrals to a general practitioner, community nurse, or mental health team; and
- Our enabling services, including logistics, medicines, finance, and HR.

1.1 The Challenge

The climate crisis, largely driven by human activity such as fossil fuel consumption, signifies a global emergency marked by escalating temperatures, unpredictable weather patterns, and severe damage to ecosystems. If immediate and comprehensive measures to decrease emissions and embrace sustainable practices are not undertaken, this crisis poses a substantial risk to global biodiversity, human health, economic structures, and the overall stability of societies.

The Paris Agreement, adopted in 2015, is an international accord on Climate Change aiming to limit global warming to well below 2°C, preferably 1.5°C, compared to pre-industrial levels and to avoid the worst of climate change[1]. In recent years there has been an increasing drive by governments, organisations, and businesses to realise emission reductions throughout the economy, in support of the Paris Agreement.

In 2019, the UK Government amended the Climate Change Act (2008) to set legally binding targets to achieve net zero emissions by 2050. *'Net Zero Strategy: Build Back Greener'* was later published in 2021 to set out how the Government will achieve these targets[2].

[1] UNFCCC, 2022. What is the Paris Agreement? Available at: https://unfccc.int/process-and-meetings/the-paris-agreement
[2] UK Government, 2021. Net Zero Strategy: Build Back Greener. Available at: https://www.gov.uk/government/publications/net-zero-strategy

The NHS has also set out their own strategy, titled *'Delivering a Net Zero National Health Service'*. The NHS's total carbon footprint as of 2019 was calculated at 21.1 mega tonnes of carbon dioxide equivalent ($MtCO_2e$), marking a significant decrease from the 1990 baseline of 50 $MtCO_2e$. However, more effort is needed to ensure that further progress is made in the coming years. Climate change is a health emergency, and therefore it is the NHS's responsibility to reduce our own impacts while ensuring that we are as adaptable and resilient as possible.

In support of decarbonisation measures across the NHS, the *2021/22 NHS Standard Contract*[3] sets out the requirement for all Trusts to develop a Green Plan to detail their approaches to reducing GHG emissions in line with the national trajectories. SECAmb has developed its own Green Plan in line with requirements and guidance.

[3] The NHS Standard Contract 2022/23. Available at: https://www.england.nhs.uk/wp-content/uploads/2022/03/03-full-length-standard-contract-22-23-service-conditions.pdf

2 Our Vision

This Green Plan aligns with the wider NHS expectation to increase the net zero ambition and renewed delivery focus, with three clear outcomes:

1. *Ensure that the Trust is supporting the NHS-wide ambition to become the **world's first healthcare system to reach net zero carbon emissions**.*
2. *Prioritise interventions, where possible, which simultaneously **improve patient care and community wellbeing** whilst also **tackling climate change and broader sustainability issues** (recognising the circumstances under which ambulance services must operate, i.e., providing emergency care and transport).*
3. *Plan and make prudent capital investments while **increasing efficiencies**.*

We want to achieve our net zero ambitions in close collaboration with our partners through co-investments and a multi-ICS approach, sharing resources and identifying funding opportunities.

3 Development of the Green Plan

Our approach to the development of our Green Plan involved:

- Completing an organisational greenhouse gas emissions inventory, identifying 'hot spots' and developing decarbonisation trajectories and milestones;
- Working with Fleet, Estates & Facilities, and Medicines teams to understand in-flight costs and prioritise a set of interventions to reduce emissions;
- Building a comprehensive 3 Year, 10 Year and full Net Zero Roadmap which sets out the type of activities needed to get to net zero, including indicative costs to inform business cases;
- Building an interactive net zero planning tool to support the Roadmap, which can be used to design and cost annual decarbonisation programmes;
- Developing monitoring and reporting methodology aligned with the Greenhouse Gas Protocol to support benefits realisation and ensure a consistent approach to future monitoring and reporting of emissions;
- Designing and delivering training to our executive staff to support them in planning for organisational changes and implementation of new ways of working; and
- Sharing the Roadmap with colleagues to raise awareness, gain support, and begin implementation.

Engagement:

Engaging widely with internal stakeholders and partner organisations is essential in identifying priorities and stimulating productive collaboration. In the development of the Roadmap, we reached out to relevant partners in our Integrated Care System (ICS): Surrey Heartlands, Sussex, Frimley, and Kent & Medway. Through this collaboration we aimed to:

- Identify opportunities where we can jointly benefit from to maximise co-investment.
- Align the Green Plan and decarbonisation funding strategies where possible.
- Optimise collaboration and share resources.
- Consider how we can benefit from a multi-ICS approach to deliver on the Trust and NHS vision.

Based on the results of the GHG emissions assessment and discussions within internal stakeholder workshops, a series of workstreams and teams were identified to co-create and lead delivery of the ***Net Zero Roadmap: Travel & Transport, Estates & Facilities, and Medicines & Consumables***. At a high level, we have summarised on the following pages our plans to address these for each team.

Travel & Transport - Transition to an electrified operational fleet

Our fleet is the largest contributor to our carbon footprint.

In order to reduce fleet emissions without impacting our operations, we will develop a Fleet Transition Plan which will set out clear processes and targets for the decarbonisation of our vehicles.

We will use telematics data from our existing fleet to map strategic points where electric charging points can be installed and take advantage of our dwell times to refuel.

Estates & Facilities - Retrofit our estate and adopt net zero building standards

We will implement a board selection of interventions across our estate which prioritise decarbonisation, energy savings, and cost reduction.

Initial activities will focus on improving energy efficiency throughout the estate through the installation of new insulation, heating and cooling systems, and double glazing. We will prioritise our top emitters in order to have the greatest impact on our carbon footprint.

Medicines & Consumables - Reduce GHG emissions associated medical gas use

Nitrous oxide is a greenhouse gas with a global warming potential 300 times that of carbon dioxide.

Our Chief Pharmacist and the wider team are exploring new technologies and products that will reduce the volume of nitrous oxide being emitted through Entonox use and develop a new track and trace system to better manage our medical gas stocks.

We will also consider waste reduction and identify initiatives to mobilise our people to support and start build the right culture to support the change.

Workforce & Systems Leadership – Setting our staff up for success

Essential to the delivery of these measures is the input from our staff, SECAmb Green Network, our Green Champions and wider system partners. Sustainability is not just about financial investments – it is also about investing in the success, empowerment, and wellbeing of our people.

We will consult our staff to understand what inefficiencies need addressing and how we can enable our workforce to tackle them. We will also invest in carbon and sustainability literacy training for our team and continue to identify Green Champions across our sites who can advocate for and oversee the measures we implement.

4 SECAmb's Carbon Footprint

Our baseline emissions were calculated using data from the 2019/20 financial year. These are the emissions that we can measure our progress against. As 2019/20 was the last pre-COVID financial year, this provides a good estimate of what our emissions look like during 'normal' operations. The calculation methodology is in line with the *Greenhouse Gas Protocol*[4], which defines three Scopes for accounting and reporting of GHG emissions:

Scope 1: Direct GHG emissions occurring from sources that are owned or controlled by the reporting entity.

Scope 2: Electricity indirect GHG emissions from the generation of purchased electricity consumed by the reporting entity.

Scope 3: Other indirect GHG emissions. This is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company but occur from sources not owned or controlled by the reporting entity.

*Our baseline emissions were calculated at **14,778 tCO_2e**, with the main sources being our Fleet, Estate, and Medicines.*

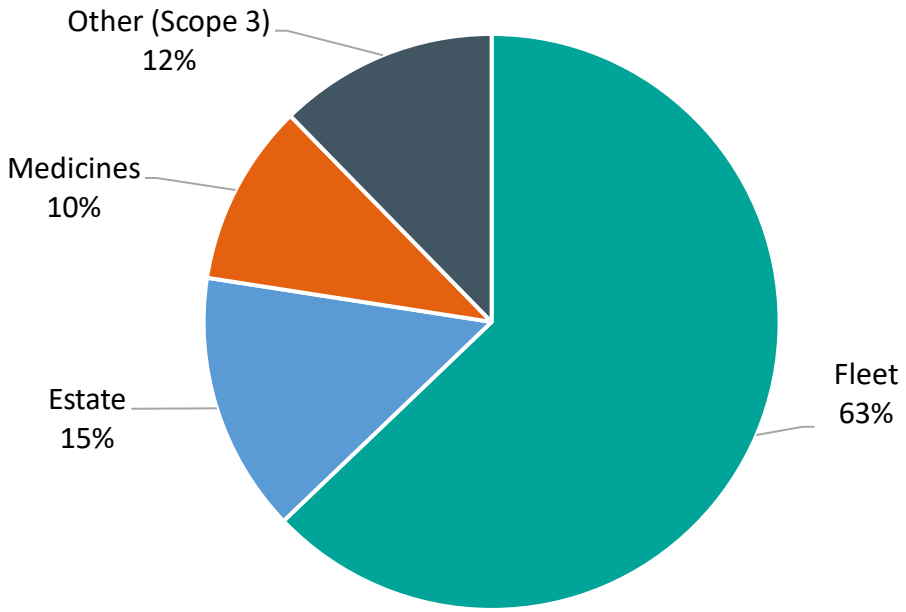


Figure 5 Emissions by source

[4] The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, The World Business Council for Sustainable Development and World Resources Institute, updated 2015

4.1 Fleet Emissions

Our **fleet** is essential for maintaining our operations, but it is also our greatest emitter. During our baseline year, fleet contributed 63% of our overall emissions with a total of **9,236 tCO_2e**.

The majority of our fleet decarbonisation efforts will rely on transitioning our fleet to ultra-low emissions vehicles (ULEVs) and zero emission vehicles (ZEVs). This requires a robust transition strategy and significant investment in new and emerging technologies and charging infrastructure.

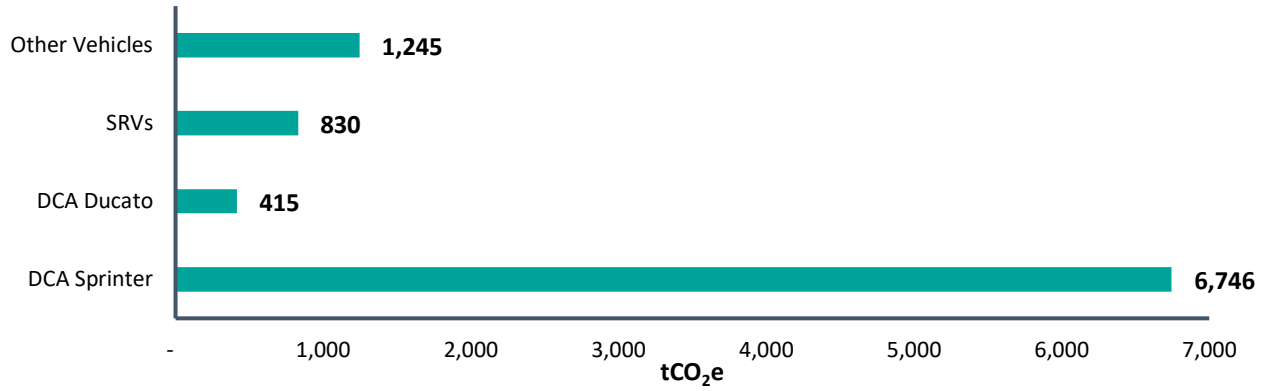


Figure 6 Fleet emissions by vehicle type

4.2 Estate Emissions

Our **estate** is responsible for 15% of our total emissions, **2,146 tCO_2e**, stemming from our electricity and gas usage. These emissions are influenced by overall building efficiency, electricity sources, fuels for heating, and to occupant behaviour. As our estate evolves from old site being disposed or new sites being opened, it is our responsibility to ensure that we consider building efficiency, energy sources, and emissions when making these decisions.

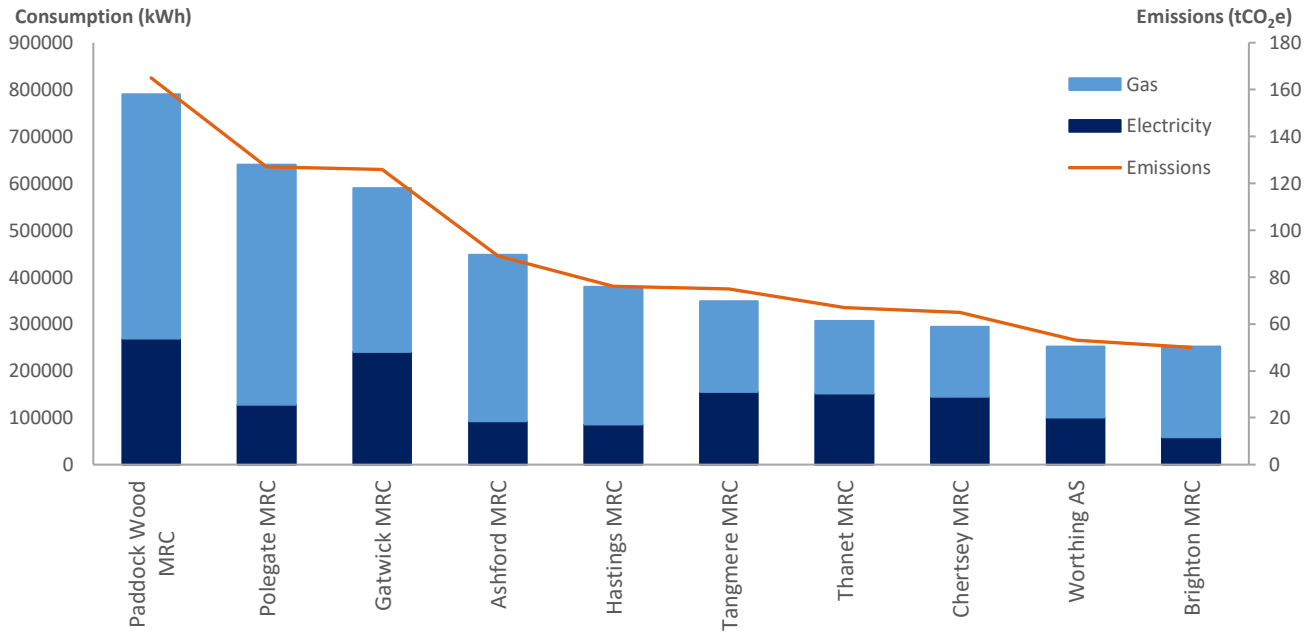


Figure 7 Top 10 emitters within SECAmb's estate

Out of 110 sites, over half of the emissions produced by the estate in 2019/20 were emitted by just ten sites. The majority of the highest emitters were Make Ready Centres (MRCs), where many of our site-based vehicle operations are carried out. These sites often have the largest energy consumption, and the poorer energy efficiency, both due to operational needs and building components. In order to reduce emissions, we need to investment in building improvements and encourage behavioural changes.

4.3 Medicines Emissions

'**Medicines**' refers to the emissions resulting from the use of Entonox. Entonox, also known as gas and air, is an acute analgesic made from a 50/50 mix of oxygen and nitrous oxide (N_2O). N_2O has a high global warming potential, and it is difficult to control the fugitive emissions that result from its use. Entonox is responsible for **1,504 tCO_2e** – equivalent to 10% of SECAmb's total baseline emissions.

4.4 Other Emissions

The remaining sources contributing to SECAmb's[5] baseline are all considered to be Scope 3:

- Water supply and treatment
- Fuel and energy related activities (FERA)
- Waste generated in operations
- Business travel

These sources together contribute **1,809 tCO_2e** to our total emissions, ~90% of which is produced from FERA. These activities are out of SECAmb's direct control, but there are still actions that we can take to mitigate the emissions associated with FERA and other Scope 3 sources.

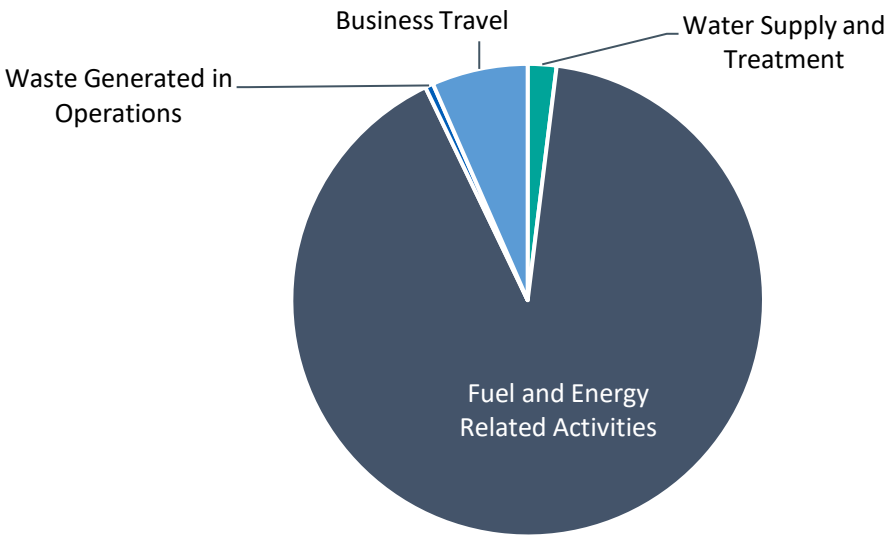


Figure 8 Scope 3 emissions by source

[5] Greenhouse Gas Protocol, 2001. Category 3: Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2. Available at: https://ghgprotocol.org/sites/default/files/2022-12/Chapter3.pdf

5 Monitoring and Reporting

To understand and demonstrate the impacts that our efforts are making, we will need to monitor and report regularly on our updated emissions. Using a standardised approach, we will prepare an annual GHG inventory that provides consistency and transparency to our colleagues and key stakeholders. This will use the same methodology as that of the baseline assessment so that future inventories can be compared like-for-like against the baseline.

5.1 Organisational Boundary

SECAmb reports GHG emissions on the basis of operational control, including our vehicle fleet, building estate, and medicines related emissions. These areas include emissions resulting from the fuel used by our ambulances, the consumption of electricity and gas across our estate, and the fugitive emissions resulting from medical gas use. The full scope of reporting includes activities undertaken by SECAmb, and some activities of our suppliers.

5.2 Approach

Our approach is based on The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard[6] and applies the generally accepted GHG accounting principles of relevance, completeness, consistency, transparency and accuracy. It is noted that the GHG Protocol Corporate Standard covers the accounting and reporting of the seven greenhouse gases covered by the Kyoto Protocol ('the Kyoto gases')[7]. Figure 6 from '*Delivering a Net Zero National Health Service*' indicates six major emissions (Kyoto gases), as well as CFCs. No emission sources from CFCs or the Kyoto gas nitrogen trifluoride (NF_3) are identified in SECAmb's baseline GHG emissions. In the event that CFC refrigerants or other non-Kyoto gas emissions are identified in future year's reporting, they should be reported separately to the Scope 1, 2 and 3 emissions[8].

The activity data used to calculate emissions was collected at site level using supplier invoices and mileage expense data. Fuel consumption data for the fleet was generated by the fleet telematic system. An Excel-based emission calculator was developed to collate and activity data and calculate associated GHG emissions, and emissions factors sourced from the UK Government conversion factors database were used to convert activity data into emissions[9]. The full list of activity data used to calculate emissions is provided below. View Appendix B for a full explanation on how this data was used, and Appendix C for all assumptions and estimations.

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[6] The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, The World Business Council for Sustainable Development and World Resources Institute, updated 2015.

[7] Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).

[8] The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, The World Business Council for Sustainable Development and World Resources Institute, updated 2015, chapter 9

[9] The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard, Revised Edition, The World Business Council for Sustainable Development and World Resources Institute, updated 2015, chapter 9

Scope 1

- Fuel/mileage from vehicle fleet
- Natural Gas
- Refrigerants (not used in the baseline)
- Medical Gases (Entonox)

Scope 2

- Electricity supply

Scope 3

- Water supply and wastewater treatment
- FERA
- Waste
- Business travel

Figure 9 Emissions Data Sources

5.3 Materiality and Restatement

Significant structural or methodological change may require restatement of the baseline GHG emissions to ensure that data is reported consistently and allow meaningful comparison of emissions over time. The criteria for restatement of GHG emissions are material changes to:

- The scope of reporting;
- SECAmb's activity data;
- Underlying assumptions;
- The calculation of GHG emissions; or
- SECAmb's organisation and structure.

'Material changes' refers to changes that result in alterations to calculated GHG emissions, either individually or collectively, of >3% of total reported emissions. For example, fugitive refrigerant losses were not reported in the baseline dataset, due to lack of data available. If/when data becomes available, the baseline shall be recalculated to include this and restated if it results in a material change in reported emissions.

Any new facilities opening, unless otherwise stated, will be measured from the date which SECAmb takes operational control. The environmental targets baseline will be adjusted to incorporate acquired sites and restated when performance data is first included in the external reporting scope, after one full year of operation. Environmental target baselines will also be adjusted if/when sites are closed/leave the SECAmb estate.

The data collection process will be reviewed during the annual reporting. It is recognised that there are potential sources for error in the reporting.

6 Net Zero Targets

To meet net zero targets, organisations must reduce emissions to zero or to a residual amount consistent with reaching net zero through carbon sequestration or removals[10]. In line with national and international decarbonisation efforts, the NHS has set targets to achieve deep near-term emission reductions and a longer term target to attain net zero[11].

- **NHS Carbon Footprint:** Net Zero 2040 for the emissions the NHS controls directly, with an ambition to achieve an 80% reduction by 2028 to 2032 from a 1990 baseline.
- **NHS Carbon Footprint Plus:** Net Zero 2045 for the emissions the NHS has the ability to influence, with an ambition to achieve an 80% reduction by 2036 to 2039 from a 1990 baseline.

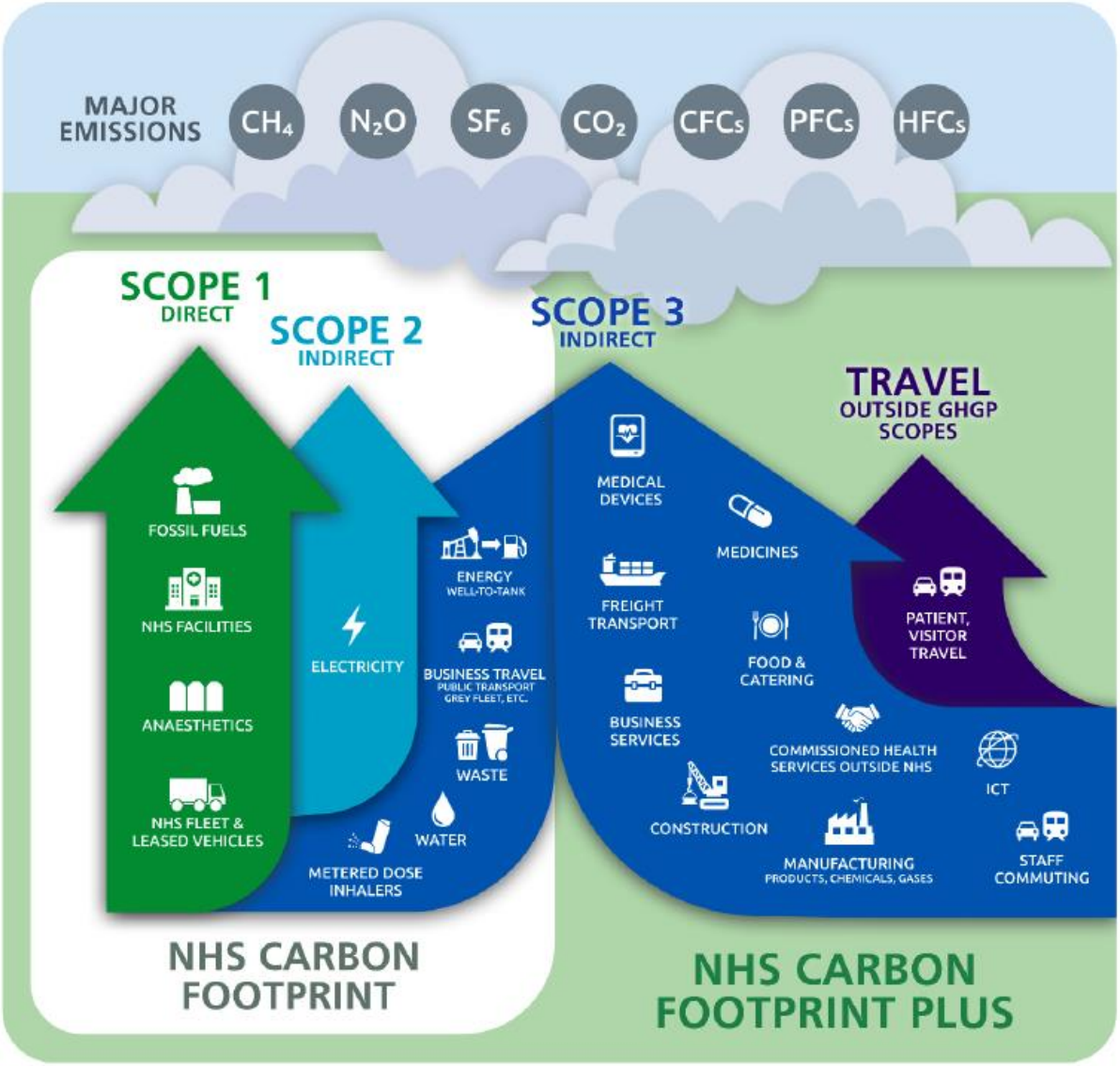


Figure 10 NHS carbon footprint categories

[10] Science Based Targets Initiative, 2023. SBTi Corporate Net Zero Standard. Available at: https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf

[11] NHS, 2022. Delivering a Net Zero National Health Service. Available at: https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/

This Green Plan has been created in line with the NHS Carbon Footprint targets to achieve net zero by 2040. It provides initiatives for the following timeframes:

- **Near-term:** This is our Three Year Plan, covering the period of 2023-26. The majority of the initiatives laid out in this Plan are intended to be carried out or initiated within this period.
- **Mid-term:** This is our Five Year Plan, covering the period of 2026-28. This will be a crucial period in the decarbonisation of our Fleet, and will be detailed in our next Green Plan.
- **Long-term:** This is our Ten Year Plan, taking us up to and beyond our 2032 targets.

Carbon Footprint Scope	1990	2010	2015	2019	2020 (est.)
Climate Change Act – carbon budget target		25%	31%		37%
NHS Carbon Footprint ($MtCO_2e$)	16.2	8.7	7.4	6.1	6.1
NHS Carbon Footprint as a % reduction on 1990		46%	54%	62%	62%
NHS Carbon Footprint Plus ($MtCO_2e$)	33.8	28.1	27.3	25.0	24.9
NHS Carbon Footprint Plus as a % reduction on 1990		17%	19%	26%	26%

Table 2 NHS emissions from 1990 to 2020

The NHS's targets are based on a 1990 baseline. Since SECAmb's baseline starts in 2019, in order to align our ambition with the NHS' overarching decarbonisation trajectory and align to the ambitions of the Paris Agreement and Science-Based Target initiative, we will aim to achieve a 50% reduction in emissions by 2028-2032. The 80% reduction target will remain as a stretch target to aim towards by 2032 until an appropriate near-term target has been agreed by our Executive Board.

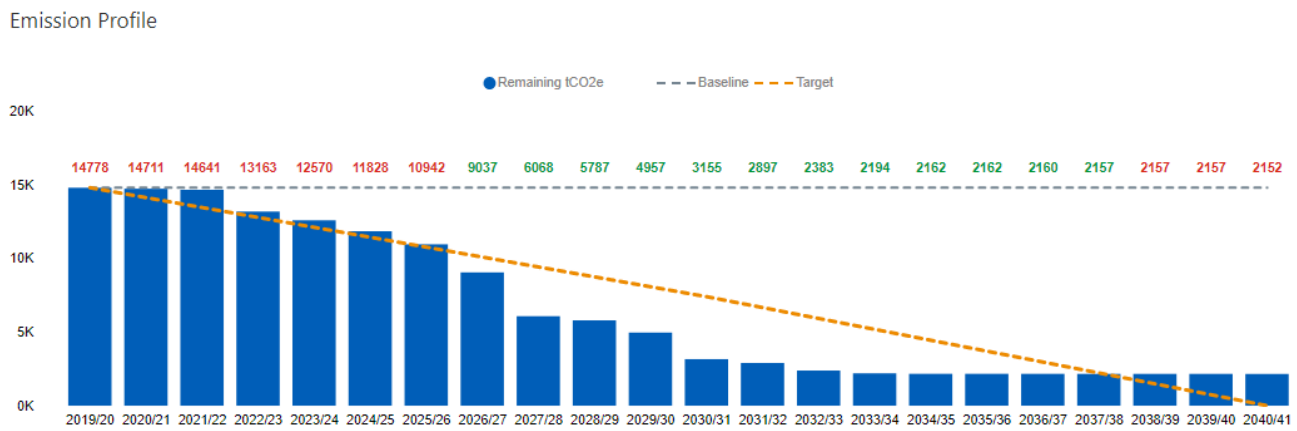


Figure 11 Our net zero trajectory

In order to be on a trajectory to achieve 50% reduction by 2028-2032. This is a significant undertaking and will require collaboration and cooperation from all of our partners and colleagues.

Areas of Focus

Initiatives for achieving Net Zero

Carbon Reduction Roadmap

A number of key focus areas have been identified for decarbonisation from our baseline assessment. This includes our fleet, estate, and medicines, as these are our top emitting areas and provide the greatest decarbonisation potential.

We first aim to fully electrify our vehicle fleet by the end of 2032. Achieving this will require substantial investment into new technologies and electric vehicle charging infrastructure (EVCI), and to maximise the impact of a fully electrified fleet, we will also need to invest in the procurement and production of green energy across our estate. This will require a combined fleet-estate decarbonisation approach.

There are many potential short- and long-term interventions that can be implemented across our estate, ranging from the purchase of green energy contracts, to retrofitting our existing sites to improve energy efficiency. This approach will help to reduce the footprint of both our fleet and estate, and improve our overall resilience. This will be essential in reducing the risk associated with blackouts, allowing us to maintain operations during crises.

The emissions associated with medicine use is more complicated to address. Our number one priority will always be the health and wellbeing of our patients, and therefore any changes to the way that we administer our care will need to be carefully considered. Our current method for recording medicines related emissions leaves room for significant discrepancies; in order to ensure we are making informed decisions we first need to improve our data quality in this area. Digitalisation is allowing healthcare systems to record, analyse, and transfer information quickly and more accurately; we need to take full advantage of the digital tools available to us in to deliver the best service we can.

Finally, decarbonisation will not be achieved through investments alone. Many of our emissions can be influenced by our behaviour, from turning lights off in empty rooms to recycling paper and plastics. We have a responsibility to our colleagues to not only communicate our expectations, but also to make these behaviours easy and accessible. And SECAmb is working closely with the newly launched Green Staff Network to identify opportunities to generate support from our entire workforce.

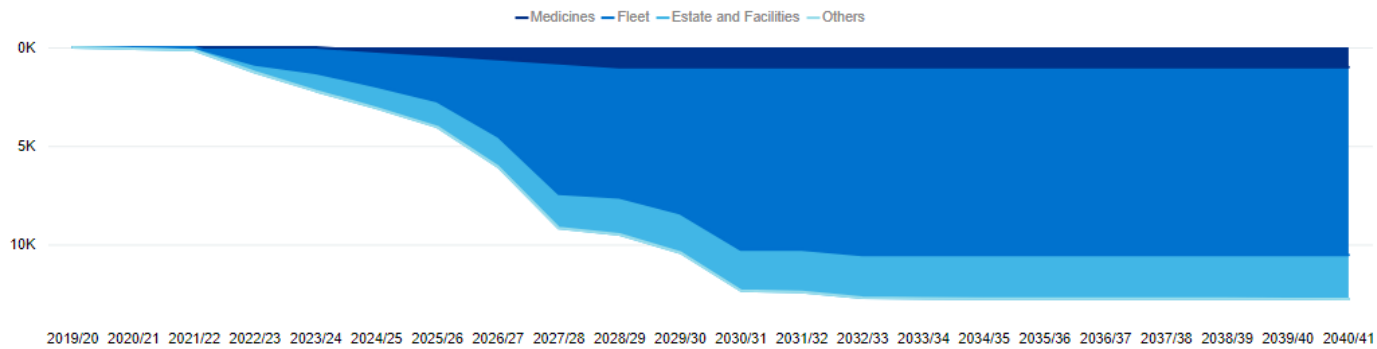


Figure 12 Carbon saving potential across all workstreams

7 Travel and Transport

Our operational fleet constitutes a significant part of our organisational carbon footprint, accounting for 9,236 tCO_2e during the 2019/20 baseline year. Given that this makes up 63% of our total footprint, it is important to swiftly initiate measures to mitigate these emissions. In order to achieve our near-term target, our fleet will need to achieve an annual emissions reduction of around 513 tCO_2e.

7.1 Key Performance Indicators

Surrey Heartlands, one of SECAmb Integrated Care Boards (ICBs), has set out a series of Key Performance Indicators (KPIs) which SECAmb is already reporting to.

Key Performance Indicators set by Surrey Heartlands ICB

1. *Ensuring that the region's owned and leased fleet is made up of at least 90% Low Emission Vehicles (LEV) by March 2024. This should include a target of 5% of the fleet being made up of Ultra-Low Emissions (ULEV) and Zero Emission Vehicles (ZEV) by March 2023, ensuring that all vehicles (under 3.5 tonne) purchased or leased from 1 April 2022 onwards are ULEVs or ZEVs.*
2. *Ensuring that only ULEVs or ZEVs are available to staff through car salary sacrifice schemes from 1st April 2022.*
3. *Ensuring all ICSs have a salary sacrifice cycle-to-work scheme in place for staff; as well as facilities available to encourage staff and visitors to cycle-to-work where appropriate.*

Only around 5% of our travel and transport emissions can be attributed to our grey fleet (i.e., vehicles owned or rented by our staff). However, there are still steps being taken to allow our staff to improve their own travel emissions. A number of our sites already have access to EV charge points, which our staff and visitors can utilise. We have also begun to include travel plans with our significant estate builds, as well as providing bicycle schemes for staff. These schemes can be further adapted to help contribute towards our KPIs. The remaining 95% of emissions are produced by our operational fleet, which will be the primary focus in the upcoming section.

7.2 Operational Fleet

63% of SECAmb's total emissions derive from our vehicle fleet. Of this, 77% is produced by DCAs (Figure 8). In order to reduce these emissions in line with the NHS net zero targets, a fleet transition plan will be developed. In addition, SECAmb needs to respond to regulations and targets set by the UK Government, including for all public sector vehicles to be fully zero emission at the tailpipe by 2027.

The fact that Ultra-Low Emission (ULEV) and Zero Emission (ZEV) vehicle alternatives to DCAs are not widely available outside of trials presents a challenge. For this reason, these vehicles are to transition in line with the target set by the UK Government of transition by 2027 and is a significant barrier to NHS's own targets. The roadmap developed utilises the existing fleet replacement cycle to provide a target roadmap for vehicle replacements, to achieve this we will need to prioritise our non DCA fleet. Around 55 vehicles will need to be replaced per year up to 2026, when the first EV DCAs are expected to be available.

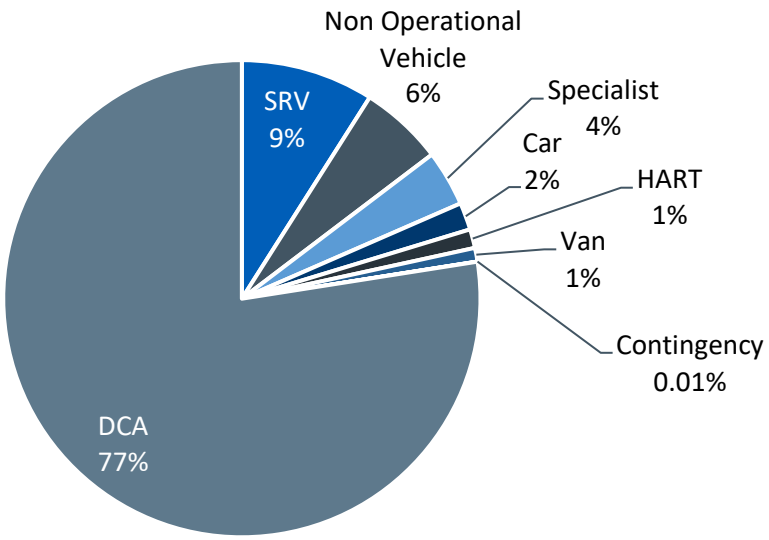


Figure 13 Vehicle emissions based on asset type

7.3 Planned and Ongoing Initiatives

SECAmb are already taking steps to reduce our carbon footprint. In 2021, a significant proportion of our ambulance fleet were replaced with more fuel-efficient vehicles, and we are proactively moving towards ULEVs or ZEVs for non-emergency vehicles and lease cars. We have also signed up as a participating Trust in Project Zero, a programme that will allow us to test zero emission ambulance options.

At 9.5%, SECAmb currently has the lowest proportion of See & Treat responses in the country. We are making efforts to increase this to 13%, and have plans to increase this further to 17% by the end of 2023. This will reduce the proportion of See & Convey responses that we make, with the dual benefit of reducing strain on our hospitals and improving our tailpipe emissions. We also have plans to increase the proportion of Hear & Treat within our responses. This is a vital first step in changing the way we as an organisation operate.

7.4 Fleet Review

The fleet comprises the majority of SECAmb's emissions profile, with around 68% coming from vehicle usage. As such, transitioning the vehicle fleet is critical to the decarbonisation of SECAmb's operations. As part of the NHS Carbon Footprint targets, we have made a commitment for 90% of our fleet to be ULEV and ZEVs by 2028, to reach near term decarbonisation targets. For non-ambulance vehicles, options for a complete transition to ZEVs by 2032 will be a key focus.

7.4.1 Existing Fleet

At the time of writing, SECAmb's existing fleet consisted of 668 vehicles, all of which are Internal Combustion Engine (ICE) vehicles:

- 398 DCAs:
  - 298 Mercedes-Benz Sprinters
  - 100 Fiat Ducatos
- 134 Specialist Response Vehicles (SRVs)
- 138 Other vehicles

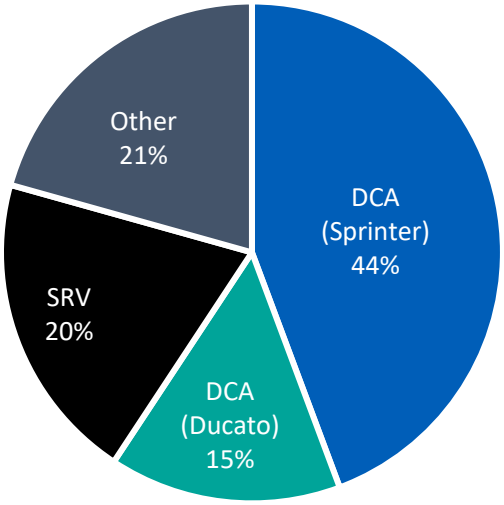


Figure 14 SECAmb's vehicle fleet makeup

7.4.2 Fleet Usage

The primary purpose of SECAmb's vehicle fleet is to provide incident response service as part of NHS England. As such, SECAmb's fleet is largely made up of response vehicles, such as DCAs, which are based at multiple sites across England's South East Coast in preparation for rapid response. An analysis of vehicle behaviours across SECAmb's fleet shows two feasible options for charging – rapid (50kW) charging and fast (22kW) charging.

Short dwells requiring rapid (50kW) charging

The shortest dwell time for a vehicle at site was recorded as 44 minutes. The furthest distance travelled after a short dwell time was recorded as 64 miles. A typical DCA can charge around 80 miles in 1 hour on a rapid charger. A typical rapid charging event will be

required to deliver sufficient power to provide a vehicle range of 64 miles with 44 minutes of dwell/charging time.

Long dwells allowing fast (22kW) charging

For vehicles with longer dwell times, the typical distance travelled is approximately 197 miles. Given the range of the vehicles using each site, typically 1-2 graze charges for 40 minutes would be more than sufficient to maintain vehicle charge between long dwells. Using 22kW chargers would provide a slower 'conditioning' charge that supports vehicle battery health long-term.

It is worth noting that multiple factors may affect SECAmb's fleet energy efficiency, including the following:

- **Driving Style:** For the purpose of emergencies, a more urgent style of driving is adopted which involves rapid acceleration and braking, increasing energy consumption. For ICE vehicles, the energy required for braking cannot be recovered, whilst with EVs, the braking energy can be recovered by using regenerative braking technology.
- **Battery technology:** Through the years, EV technology has vastly improved, increasing battery efficiency, performance, and lifetime expectancy. EV batteries are now predicted to last between 8-20 years, well after the current lifetime of most SECAmb vehicles. Once at the end of their life they require replacing as energy efficiency decreases, with relatively costly replacement charges, when compared to replacing the vehicle.
- **Vehicle size:** Larger vehicles (namely DCAs) would require a higher amount energy to operate at speed due to the increased weight of the vehicle. This will likely result in the need for a larger battery or a reduction in range.
- **Auxiliary Systems:** Ambulances have medical systems that use power both while in transit and while stationary. If these are utilising the same battery as the drive train, there will be an impact on the vehicle energy usage. The existing storage within the DCAs for auxiliary systems is a maximum of 5.3kWh and is charged using a 2kW charger during dwells at the MRCs.
- **HVAC:** Heating, ventilation and air conditioning units are a key component to maintaining comfort of the crew and stable conditions for patients. These systems use a reasonable amount of power and have been factored into the efficiency reductions within the ambulances.
- **Temperature:** Cold weather affects the battery performance of EVs, resulting in a decrease in efficiency as temperatures drop. Studies typically show a range decrease between 10-30% caused by a slower release of energy from the vehicle's lithium-ion cells. Cold temperatures can also result in reduced charging speeds, resulting in a decrease in efficiency when servicing larger fleets at busy charging hubs.
- **Topography:** As with all vehicles, energy efficiency is affected by the topography of the route taken. Vehicles operating in an area of steep topography will experience a reduction in range relative to vehicles operating along flat surfaces as additional energy is expended.

7.4.3 Fleet Replacement

7.4.3.1 EV Replacement Models

In order for SECAmb to provide a like-for-like service, suitable EV models will have to be identified to replace our existing vehicle fleet of DCAs, SRVs, and other vehicles. SRVs are typically estate style cars and DCAs are typically retrofitted transit vans.

SRVs and other car-body vehicles have a much more developed EV market with significantly greater range than EV van models. There are various alternative EVs on the market that suit SECAmb's operations. Technology for smaller EV types continue to improve at a much quicker pace and with a broader range of vehicles available, further reducing the range anxiety related to transitioning these vehicle types.

Electric transit vans have a current expected range up to 250 miles, with most sitting between 180-220 miles, and continuous new developments in battery technology aim to enhance battery performance. In recent years manufacturers have been adopting lightweight materials with the purpose of reducing energy requirements, in addition to reducing battery size in larger vehicles. Improvements in battery energy density are expected to increase the range of EVs.

The EV market is highly dynamic and growing at a rapid pace. Most manufacturers have committed to phasing out ICE vehicles by 2030 and have announced a range of EVs to replace their current models. This, partnered with new technology such as solid-state batteries, will see an increase in vehicle range and capacity. **Error! Reference source not found.** presents a range of EV models currently on the market that could present suitable vehicle replacement options for DCAs and SRVs along with their range and battery specifications.

Make	Model	Range* (Miles)	Battery Size (kWh)	Vehicle Type
Fiat	E-Ducato (5 Battery module)	229	79	Transit van
Vauxhall	Movano-E (70kWh)	139	70	Transit van
Mercedes-Benz	eSprinter (113 kWh)	186	113	Transit van
Maxus	eDeliver 9	219	88.5	Transit van
Iveco	eDAILY (3 battery module)	162	111	Transit van
Ford	E-Transit	196	75	Transit van
Audi	Q8 Sportback e-tron	343	106	Estate Car
Mercedes-Benz	EQC Estate	254	85	Estate Car
Volkswagen	ID.4	310	77	Estate Car
Ford	Mustang Mach-E Premium	342	98	Estate Car
Kia	e-Niro	230	64	Estate Car

Table 3 EV replacement models

**Ranges shown have been provided by the manufacturer indicating WLTP conditions. As a result, real world conditions for incident response vehicles may reflect a lower range than stated depending on driving conditions and style, a 20% reduction has been assumed for all further calculations.*

7.4.3.2 Fleet Replacement Timeline

To minimise operational disruption during fleet transition, an asset/vehicle replacement profile has been established. The asset replacement profile allows for a smooth transition of vehicles over the coming years up to 2032. The asset replacement profile is based on the following assumptions:

- All appropriate vehicles to be converted to zero emissions by 2027 under UK Government mandate for public bodies;
- DCA EV replacement model is expected to be widely available in 2026;
- Zero tailpipe emissions for all fleet to be achieved by the end of 2032; and
- Replacing vehicles at end of life to reduce embodied carbon impacts from procuring new vehicles outside of typical replacement profile.

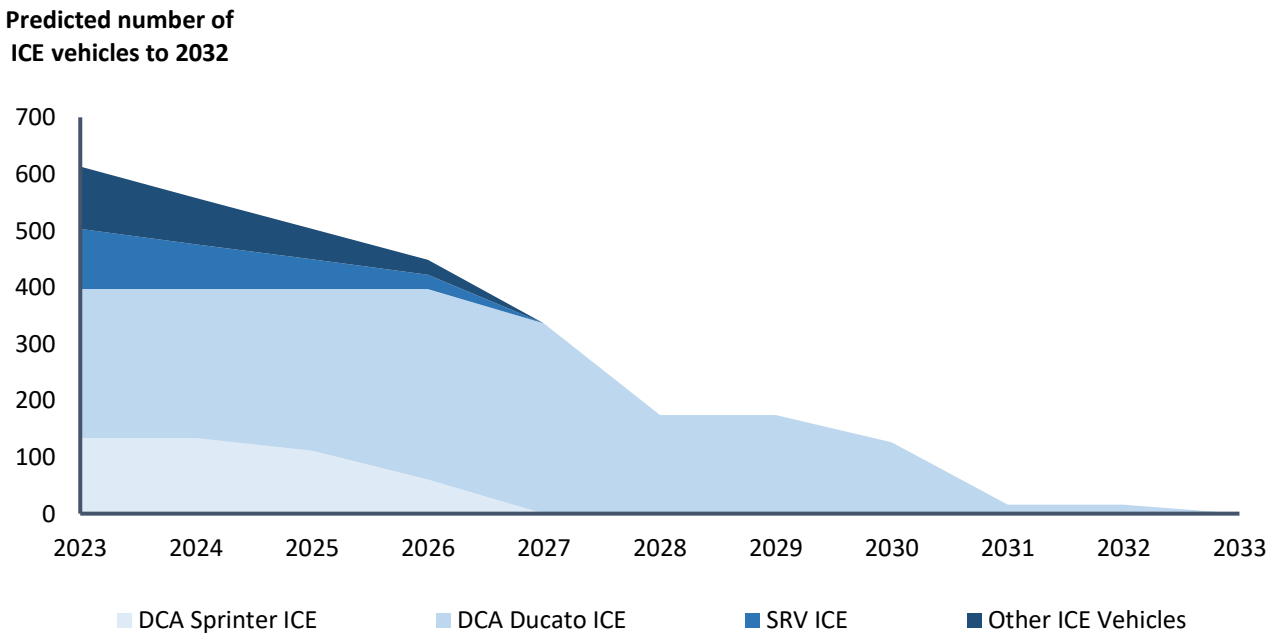


Figure 15 Proposed ICE vehicle count to 2032

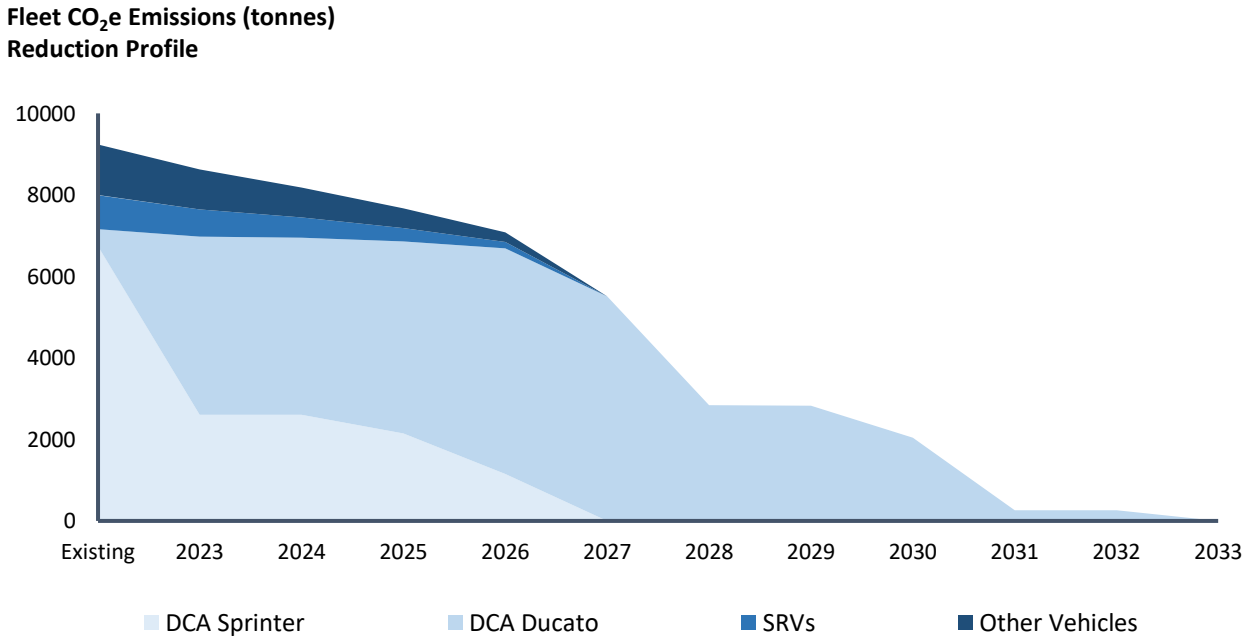


Figure 16 Emissions reduction profile

7.4.3.3 Hydrogen Fuel

Our fleet replacement plan revolves around transitioning our existing ICE vehicle fleet to battery-electric powered alternatives. However, hydrogen can also be used to power either a hydrogen fuel cell or a hydrogen internal combustion engine.

Technology advancements continue to make onsite generation of hydrogen more and more viable, with significant improvements in electrolysis. Electrolysis allows hydrogen production on site, provided there is a source of energy for input into the electrolysis process. Alternatively, hydrogen can be stored in pressurized gas cannisters and also distributed in this state, and is a suitable fuel for heavy duty, energy-intensive vehicles, as demonstrated by its use as an alternative fuel in buses and plant machinery.

As an alternative fuel, hydrogen is in the early phases of market maturity, and so the UK currently does not make enough green hydrogen (hydrogen produced by renewable technology) for it to be a suitably resilient energy source. Subsequently, compared to battery electric, hydrogen has expensive infrastructure and supply chain costs. However, the rapid expansion of renewable energy in the UK and Europe provides strong possibilities for the mass production of green hydrogen in the future.

Given this uncertainty and low levels of maturity both in the vehicles and hydrogen supply, these have not been factored into the preferred development plan for fleet transition. This will require a review as these technologies mature, as hydrogen vehicles may be more suited to posts with longer conveying distances and increased range requirement.

7.5 Site Charging Review

SECAmb's sites will need to provide charging infrastructure to support the transition of our fleet to EV. An assessment has been conducted to identify where priority dwells for charging new EVs are located, and identifying the levels of charging required at each of these key locations based on fleet requirements. Other critical operational sites will also be important for the successful implementation of an electrified fleet. We are working with our ICBs to maintain operational efficiency, and given that a large proportion of our dwells are located on hospital sites, charging infrastructure will be required at these sites alongside those installed across the SECAmb estate.

SECAmb are investigating all aspects of site usage to develop the EV charging infrastructure requirements. This includes assessment of the number of vehicles stationed at the site, how long they dwell on site, and any other significant dwell patterns. This ultimately informs the recommendations for installation of electric vehicle charging points (EVCPs) at each site, such as the number and type of chargers required. A review has been undertaken of the fleet's overall electrical requirements in addition to the sites' existing electrical capacity for EV charging, to determine the changes or additions to the site that may be required.

Summary tables of our analysis, including the recommended number of charges for each site, are presented in **Error! Reference source not found.**4 to **Error! Reference source not found.**7.

7.5.1 EV Charging Requirements

In order to determine EV charging requirements, the utilisation of the fleet has been analysed with regards to the existing market for all suitable vehicles. For those that do not yet have a consistent specification, namely DCAs, this was analysed against the closest available vehicle.

The assessment of the fleet data formed outputs including dwell times, locations and distances travelled providing, mean, standard deviation and worst-case scenarios, these outputs have been cross examined with the vehicle specifications to identify suitability and charging requirements. This analysis proposed two requirement categories for charging:

Rapid charging requirements

For dwell times that are under eight hours.

These occur at all dwell locations. Primary locations for rapid charging include MRCs and A&E ambulance bays.

Fast charging opportunities

Key to providing charging for dwells that are longer than eight hours, and providing secondary chargers for shorter dwells where required.

These dwells primarily occurred at MRCs.

A third charging solution is being developed to provide additional validation of the existing data. Employing mobile charging units at sites with lower demand will allow data collection on usage and behaviours to identify if fixed infrastructure is required or if another location would be more suited to providing charge.

Site Name	Purpose	Fleet Priority	Installation Year	Estate Priority (RAG)	Site Leasehold/ Freehold Status	No. of Vehicles Using the Site	No. of EVCP Capable Parking Spaces	Existing No. of EVCPs	Currently Planned for EVCPs	Advised No. of EVCPs
Polegate	MRC	1	2023	G	Freehold	120	67	None	None	3 x 22 kWh 4 x 50 kWh
Hastings	MRC	2	2023	G	Freehold	46	None	None	None	1 x 22 kWh 1 x Mobile Charger
Banstead	MRC	3	2023	G	Freehold	56	None	Not Specified	None Specified	1 x 22 kWh 1 x 50 kWh
Chertsey	MRC	4	2024	G	Freehold	57	30	None	6 x 22 kWh	1 x 22 kWh 2 x 50 kWh
Gatwick	MRC	5	2024	G	Freehold	65	53	None	4 x 22kWh 1 x 80 kWh	2 x 22 kWh 2 x 50 kWh
Thanet	MRC	6	2025	G	Freehold	42	25	None	4 x 22 kWh 1 x 80 kWh	1 x 22 kWh 2 x 50 kWh
Tangmere	MRC	7	2025	G	Freehold	39	114	6 x 22 kWh	None	2 x 50 kWh
Ashford	MRC	8	2025	G	Freehold	65	68	None	4 x 22 kWh	1 x 22 kWh 2 x 50 kWh
Medway	MRC	*Information was not available at the time of publication*								

Table 4 Site stats including the recommended number of EVCPs to be installed (Table 1 of 4)Table Site stats including the recommended number of EVCPs to be installed (Table 1 of 4)

Site Name	Purpose	Fleet Priority	Installation Year	Estate Priority (RAG)	Site Leasehold/ Freehold Status	No. of Vehicles Using the Site	No. of EVCP Capable Parking Spaces	Existing No. of EVCPs	Currently Planned for EVCPs	Advised No. of EVCPs
Brighton	MRC	9	2026	G	Freehold	151	67	None	4 x 22 kWh	4 x 22 kWh 6 x 50 kWh
Paddock Wood	MRC	10	2027	A	Lease	53	57	None	None	1 x 22 kWh
Farnborough AS	Ambulance Station	11	2028	G	Freehold	41	20	2 x 7.2 kWh	4 x 22 kWh	1 x mobile charger
Tongham AS	Ambulance Station	12	2027	G	Freehold	31	36	4 X 7.2 kWh	4 x 22 kWh	1 x 22 kWh 1 x 50 kWh
Burgess Hill AS	Ambulance Station	13	2028	G	Freehold	35	18	None	None	1 x mobile charger
Guildford AS	Ambulance Station	14	2028	G	Freehold	42	6	None	6 x 22 kWh	1 x mobile charger
Sheppey AS	Ambulance Station	15	2028	G	Freehold	35	12	None	4 x 22 kWh	1 x mobile charger
Thameside AS	Ambulance Station	16	2028	G	Freehold	46	10	2 x 7.7 kWh	None	1 x mobile charger
Walton AS	Ambulance Station	17	2029	A	Freehold	31	8	None	None	1 x 50 kWh

Table 5 Site stats including the recommended number of EVCPs to be installed (Table 2 of 4)Table Site stats including the recommended number of EVCPs to be installed (Table 2 of 4)

Site Name	Purpose	Fleet Priority	Installation Year	Estate Priority (RAG)	Site Leasehold/ Freehold Status	No. of Vehicles Using the Site	No. of EVCP Capable Parking Spaces	Existing No. of EVCPs	Currently Planned for EVCPs	Advised No. of EVCPs
Dartford AS	Ambulance Station	18	2029	A	Leased	61	12	None	None	1 x 22 kWh 1 x 50 kWh
Worthing AS	Ambulance Station	19	2030	A	Freehold	48	28	2 x 7.2 kWh	4 x 22 kWh	1 x 22 kWh 2 x 50 kWh
Haywards Heath AS	Ambulance Station	20	2028	A	Freehold	41	Not Specified	Not Specified	Not Specified	1 x mobile charger
East Grinstead	Driver Training			G	Freehold	21	10	None	None	0
Godalming AS	Ambulance Station			G	Leased	25	5	2 x 7.5 kWh	None	0
Sheffield Park	Emergency Preparedness, Resilience and Response			G	Leased	0	Not specified	Not Specified	Not Specified	0
Crawley HQ (Nexus House)	999 Call Centre			A	Freehold	23	175	None	None	0

Table 6 Site stats including the recommended number of EVCPs to be installed (Table 3 of 4)Table Site stats including the recommended number of EVCPs to be installed (Table 3 of 4)

Site Name	Purpose	Fleet Priority	Installation Year	Estate Priority (RAG)	Site Leasehold/ Freehold Status	No. of Vehicles Using the Site	No. of EVCP Capable Parking Spaces	Existing No. of EVCPs	Currently Planned for EVCPs	Advised No. of EVCPs
Esher AS	Ambulance Station			A	Leased	15	Not Specified	Not Specified	Not Specified	0
Lewes AS	Ambulance Station			A	Leased	29	Not Specified	Not Specified	Not Specified	0
Lewes VMC	Vehicle Maintenance Centre			A	Leased	22	4	None	None	0
Telford Place	Logistics			A	Leased	24	Not Specified	Not Specified	Not Specified	0
Haslemere AS	Ambulance Station			R	Leased	28	None	None	None	0
Haywards Health LDC	Not Specified			R	Not Specified	25	Not Specified	Not Specified	Not Specified	0

Table 7 Site stats including the recommended number of EVCPs to be installed (Table 4 of 4)Table Site stats including the recommended number of EVCPs to be installed (Table 4 of 4)

7.5.2 Future Technology

7.5.2.1 Induction Charging

Induction charging is a contactless charging solution available at rapid charging speeds (50kW). These systems include buried or floor-mounted pads which contain induction coils which then provide charge through similarly mounted induction plates underneath a vehicle. Consideration for wireless induction chargers should be included, especially for specific vehicle types such as ambulance fleets where the technology will support reduced operational requirements on staff.

This technology creates opportunity for short-dwell high-impact locations with minimal staff to plug in the vehicles, such as A&E. If staff operate at third party sites like hospitals, this makes these sites a significant asset when considering the benefits of installing induction charging, allowing rapid charging with no physical interface to support in streamlining operations. Wireless charging therefore should be kept an as option depending on the logistics of providing the trenching and associated connectivity, as these chargers are capable of communications and detecting designated vehicles.

7.5.2.2 Reinforced Charging

Reinforced charging is also ideal for vehicles with short inconsistent dwell times and provides power rapidly while maintaining a consistent lower power draw that can be used to stabilise peak power usage from EVCPs. Reduced peak power draw for EVCPs results in reduced Distribution Network Operator (DNO) electrical infrastructure required on small sites. Charging supplied by solar or renewable reinforced charging provides a constant flow of low-cost energy which is ideal for peak dwells during the daytime.

Rapid charging can be supplied by a number of elements, including:

- Trickle charged static battery;
- Solar panels;
- Wind turbines; or
- A combination of elements.

7.5.2.3 Hydrogen

Incentives, funding, and constant improvement in **hydrogen** technology are making it an increasingly attractive and cost effective zero-carbon solution for heavier duty vehicles, such as DCAs. However, current market trends for emergency response vehicles show hydrogen being more in the ‘development of prototypes’ stage.

Hydrogen is still emerging as a viable alternative fuel, with many gaps still in the market for hydrogen fuelled emergency response vehicles. Despite this, there is an emerging trend of prototypes in development with anticipation that models will become commercially available in the short- to medium-term future.

8 Estates and Facilities

SECAmb's building portfolio is made up of 102 buildings, with 51 owned directly by SECAmb. The estate consists of Make Ready Centres (MRCs), Ambulance Stations (AS), Vehicle Maintenance Centres (VMCs), Ambulance Community Response Posts (ACRPs), Logistics and Storage hubs, and others. This portfolio is continuously optimised and upgraded to meet SECAmb's changing operational needs, with a wide variety of building ages and ownership types.

Asset Type	Total Number (2019)	Number Under SECAmb Ownership
Ambulance Community Response Post	71	31
Make Ready Centre	10	9
Ambulance Station	12	9
Vehicle Maintenance Centre	1	0
Logistics and Store	2	0
999 and 111 Call Centre	3	2
Other	3	1
Total	**102**	**51**

Table 8 SECAmb's building portfolio

A detailed gas and electricity data analysis has been completed to identify and prioritise emission hotspots and model decarbonisation opportunities. The approach to modelling focuses on energy efficiency measures (e.g., improved insulation and window glazing) to reduce heating demand, and low carbon heating systems such as heat pumps. As part of this approach, future retrofit projects should aim to increase air tightness and improve ventilation, which will reduce heating demand, improve thermal comfort, and reduce health risks to occupants.

Through a range of workshops with the SECAmb Estates and Facilities team, a number of short-term decarbonisation opportunities have been identified and modelled. Efficient integration of interventions across estate and fleet can minimise operational impact. For example, installation of EV infrastructure can be aligned with building changes to optimise efficiency in additional to ongoing annual maintenance and regular built stock refurbishment.

Any proposed estate decarbonisation opportunities will feed into and be considered during the planned update of our Estates and Facilities Strategy, which in turn will be aligned with an update of our Fleet Transition Plan. To support planning retrofitting projects in general, SECAmb will align to the *Healthcare Engineering Roadmap for Delivering Net Zero*

Carbon[12]. The Healthcare Engineering Roadmap uses a staged approach when considering retrofitting, focusing on short term solutions before considering the long term.

The approach is split into three stages:

1. **Immediate to Short Term:** Consider the viability of the existing primary heating plant and associated high temperature heat distribution. If not already deployed, implement a combined heat and power (CHP) boiler.
2. **Short to Medium Term:** Lay the foundations for heat delivery that can use the best available technology now and will be able to accept future technology as it becomes commercially available. Remove all steam heating and implement low temperature hot water (LTHW) heat distribution networks and begin to install solar PV and battery storage.
3. **Medium to Long Term:** Implement further decarbonisation technology as it becomes commercially available. Transition heating system to electric heat pumps, hydrogen fuel cells, or hydrogen fuelled boilers.

8.1 Estates and Facilities Decarbonisation Pathway

Our baseline analysis shows that around 15% of our carbon footprint is produced by our estate. To achieve our near-term target, we need to achieve significant emission reduction by 2032, and then reach zero emissions by 2040 (figure 14). This will require a coordinated response and a suite of specific reduction initiatives to be implemented.

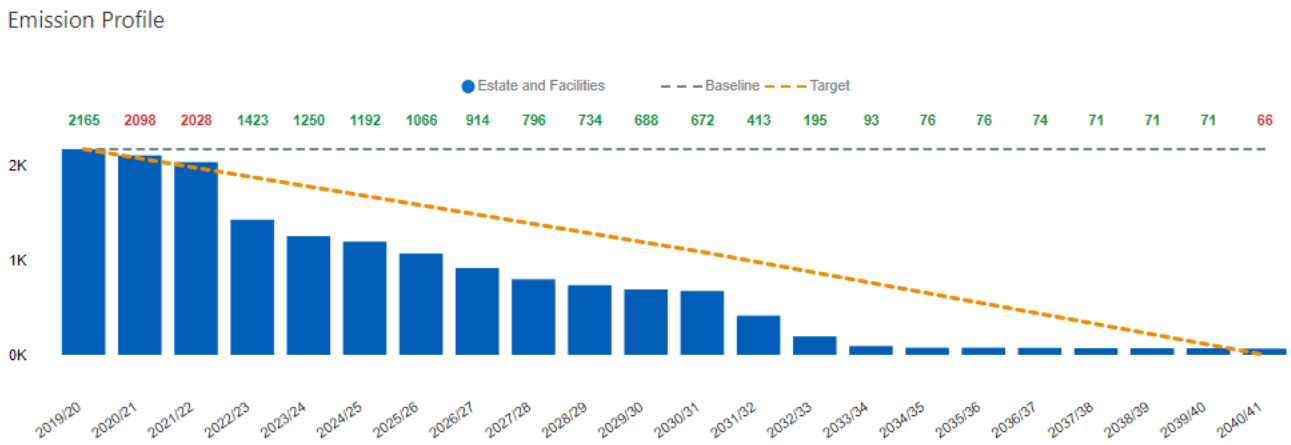


Figure 17 Trajectory to reduce CO_2e emissions to net zero by 2040 for Estates and Facilities

8.1.1 Existing Reduction Initiatives

Since the 2019/20 baseline year, we have taken action to reduce our office emissions by reducing printer numbers, recycling our IT systems and moving to greener suppliers, and reducing the use of single use plastics. For more information on our Waste related initiatives, please view the Medicines and Consumables chapter.

[12] Carbon and Energy Fund (2021). A Healthcare Engineering Roadmap for Delivering Net Zero Carbon.

In addition to these initiatives, a series of KPIs have been set out by our Surrey Heartlands ICB which we are currently reporting to. Many of these KPIs are compliant with national initiatives set out in the *NHS Standard Contract 2022/23* and the *Healthcare Engineering Roadmap to Net Zero*.

Key Performance Indicators set by Surrey Heartlands ICB

4. *Ensuring that all electricity is purchased from Renewable Sources (excluding nuclear).*
5. *Ensuring plans are in place to phase out fuel oil as a primary heat source in NHS Secondary Care sites, by ensuring all sites with oil fuel heating as a primary source have a business case for its removal.*
6. *Ensuring all new builds and retrofits over £15 million are compliant with the Net Zero Buildings Standard.*
7. *Actively participating in the Regional Estates Delivery Hubs.*
8. *A minimum of 150 Estates and Facilities Staff in each region undertake the accredited carbon literacy training in 2022-23.*

Discussions have been held with our Estates and Facilities team on how best to respond to these KPIs. Fuel oil is not used as a primary heat source on any of our sites, which means that we can focus more of our attention on the remaining points.

Since the 2019/20 baseline year, we have taken action to reduce our office emissions by reducing printer numbers, recycling our IT systems and moving to greener suppliers, and reducing the use of single use plastics. For more information on our waste initiatives, please view the Medicines and Consumables chapter.

8.1.2 Building Stock Changes

Since the 2019/20 financial year, a number of changes have been made to our building stock. This has had an impact on our carbon footprint. These interventions provide a good indication of how future building stock changes can affect and has the potential to accelerate our net zero trajectory.

Two new MRCs have been opened over the last three years: Banstead and Medway. Both of these sites are new-builds and are much more energy efficient than the sites they replaced, resulting in an overall emissions reduction of 467 tCO_2e. This is slightly offset by the acquisition of three new sites, resulting in a combined footprint of 56 tCO_2e. In total, building stock changes from the last three financial years has resulting in emissions decrease of 411 tCO_2e.

The disposal of sites that have limited operational value and high emissions/cost rates is an effective short-term solution for reducing our emissions. Three more of our sites are currently confirmed for disposal within the next three years, and a number of others are currently under consideration. These sites are not expected to be replaced, and therefore will no longer contribute to our emissions profile. In future, these decisions will be aided by

our new decision-making toolkit, which will help to identify priority sites which intervention is most needed.

8.2 Proposed Additional Initiatives

In addition to the KPIs set by Surrey Heartlands, the NHS Standard Contract 2022/23 has provided a number of environmental and sustainability requirements that Trusts must adhere to. This includes the phasing out of all fossil fuels as a primary heating source within our sites, and the purchase of 100% renewable energy sources.

Using the data gathered to assess baseline emissions, a number of key risks, opportunities, and emissions hotspots have been identified across our estate. This has been used to develop a prioritised list of interventions by site, taking into account current emissions contributions, potential carbon savings, and capital cost. A planning tool was subsequently developed based on this information, which will allow SECAmb to make carbon-informed decisions on acquisitions, disposals, and retrofits. The tool can be used to monitor progress and assess changes in SECAmb's carbon footprint.

This tool will be used alongside the Fleet Transition Plan to identify priority retrofit sites. Coordinating the rollout of EVCI with site retrofits will reduce disruption and mitigate risk. For example, the tool will allow decision-makers to identify sites which will benefit most from the installation of low-carbon interventions from operation, carbon, and cost perspectives. The installation of solar PV, battery storage, or even backup generators at these sites will reduce the risk of widespread blackouts, allowing operations to continue even during emergency situations. These sites are also likely to be more resilient to climate change impacts and will again be better equipped to maintain operational ability.

8.2.1 Strategy to Achieve a Net Zero Estate

The *NHS Net Zero Building Standard*[13] was developed in response to *Delivering a Net Zero NHS* and sets out the role that estates and facilities will play in achieving net zero targets. The Standard creates a clear set of performance criteria for net zero building, both in construction and operation, and lays out expectations for construction and refurbishment projects over the coming decade.

One of the KPIs set by our ICB states that all new builds and retrofits costing more than £15 million must abide by the Standard. However, the typical cost of a newly built MRC is less than £10 million, and it is unlikely that any site retrofits will exceed this threshold. Therefore, we have set our own target for all new builds to meet BREEAM 'Excellent' ratings, and to improve the specifications on our existing sites from 'Very Good' to 'Excellent'.

To meet energy efficiency standards and reduce our estate's emissions, many of our sites will require upgrades. These upgrades will prioritise interventions that contribute to improving a building's energy efficiency, from the installation of LED lighting to solar PV cells and moving away from fossil fuels by electrifying our heating. By doing this we will

[13] National Health Service (2023). NHS Net Zero Building Standard. Available at: https://www.england.nhs.uk/wp-content/uploads/2023/02/B1697-NHS-Net-Zero-Building-Standards-Feb-2023.pdf

benefit from the UK's grid greening ambition of achieving a net zero power sector by 2035. To start, we will initially focus on our top emitting and owned building stock, implementing the interventions which we believe will provide the greatest abatement potential and payback term.

- **Window glazing** is in important indicator of a site's energy efficiency. **Double glazing** is a simple, unobtrusive measure with the potential to reduce a building's emissions by up to 405kg of carbon a year[14].
- **LED** lighting is one of the first steps in improving energy efficiency for many buildings. This is a low-cost, low-disruption measure that can be carried out across any site, achieving energy savings of around 50-70%[15].
- **Roof insulation** is essential in improving building efficiency. By installing new roof insulation to our existing sites, we can reduce our energy usage and improve our buildings' resilience against extreme temperatures. It is important that our sites are effectively insulated before implementing new HVAC systems to ensure that they work as intended and do not result in unnecessary cost.
- **Heating, Ventilation and Cooling (HVAC)** systems can be upgraded once a building is considered to be well-insulated enough. **Air-Source Heat Pumps (ASHPs)** are a low-emission heating systems which extract warmth from outside to heat the inside using electricity, and are far more efficient than a gas boiler[16].
- **Solar PV** and **Battery Storage** are examples of on-site renewables which can help to reduce emissions from energy consumption. A single PV panel generates around 355W of energy per hour; a 20m^2 roof area will generate around 3.5 kilowatt peak (kWp). This will be especially useful in the transition to an electric fleet, preventing an increase in energy-related emissions while also reducing utility costs.

Wall insulation can be effective for reducing building emissions (particularly in old buildings) but comes at high-cost and is more disruptive. The interventions listed above have the greatest cost-benefit and will provide the more efficient carbon savings, the impact of each shown are in figure 15. Once these have been implemented, SECAmb can begin to explore how wall insulation can be upgraded with the least operational disruption possible.

[14] Energy Saving Trust, 2023. Reducing home heat loss: Windows and doors. Available at: https://energysavingtrust.org.uk/advice/windows-and-doors/
[15] The Climate Group, 2023. LED. Available at: https://www.theclimategroup.org/led
[16] British Gas, 2022. Air source heat pumps, explained. Available at: https://www.britishgas.co.uk/the-source/greener-living/heat-pumps.html

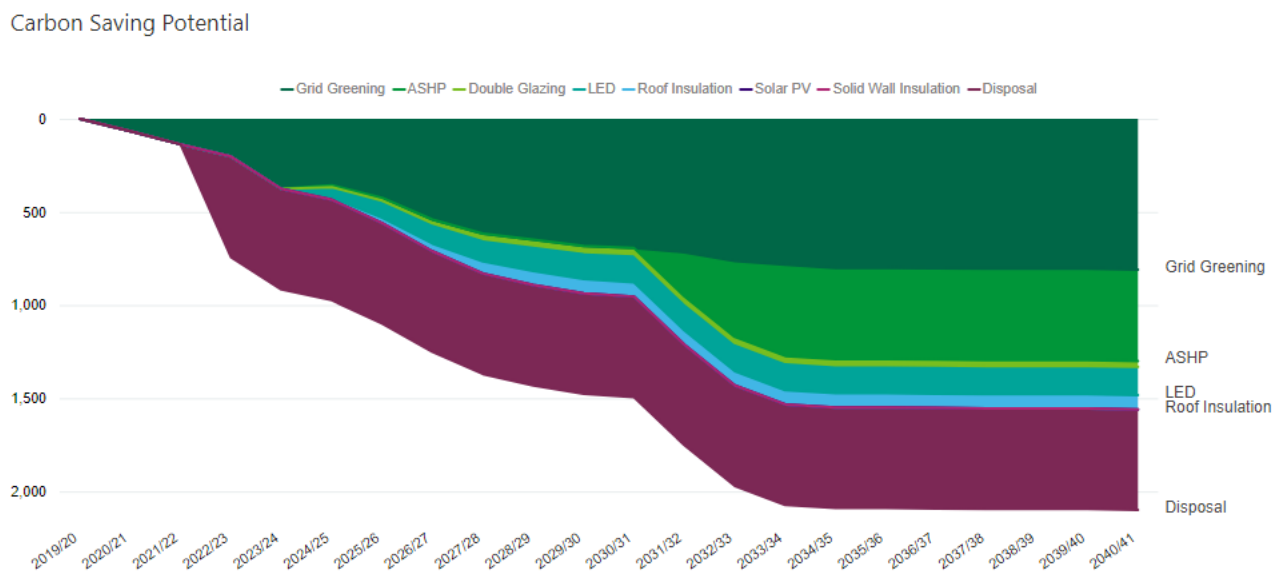


Figure 18 Carbon saving potential of interventions

Using our new carbon saving toolkit, we have been able to identify the most effective measures for each of our sites. We will begin by focusing on the sites which have been identified as our highest emitters, and, where possible, will coordinate these interventions with the installation of EVCI.

We have identified a priority list of interventions based on the cost to mitigate a tonne of carbon equivalence (tCO_2e). This allows us to prioritise and implement the initiatives that reduce our carbon footprint the most and have a higher return on investment.

Site Name	Baseline Emissions (tCO_2e)	Prioritised Intervention	Anticipated Emission Reduction (tCO_2e)
Paddock Wood MRC	165	ASHP, LED, Solar PV	113
Polegate MRC	127	ASHP, LED, Solar PV	99
Gatwick MRC	126	ASHP, LED, Solar PV	82
Ashford MRC	89	ASHP, Solar PV	60
Hastings MRC	76	ASHP, Double Glazing, LED, Roof Insulation, Solar PV, Solid Wall Insulation	52
Tangmere MRC	75	ASHP, LED, Solar PV	45
Thanet MRC	67	ASHP, Double Glazing, LED, Roof Insulation, Solar PV, Solid Wall Insulation	14
Chertsey MRC	65	ASHP, Double Glazing, LED, Roof Insulation, Solar PV, Solid Wall Insulation	17
Worthing AS	53	ASHP, Double Glazing, LED, Roof Insulation, Solar PV, Solid Wall Insulation	17
Brighton MRC	50	ASHP, LED, Solar PV	36

Table 9 Primary interventions identified for Top 10 emitters across SECAmb's estate

8.2.2 Green Electricity Tariff

In addition to the above initiatives, the NHS Standard Contract 2022/23 sets out requirements for Trusts to phase out fossil fuels as a primary heating source and ensure that all purchased electricity is from renewable sources. To ensure that we are abiding by all requirements set out by the contract and our ICBs, we will move to a green tariff with our supplier, LASER Energy. LASER offers Renewable Energy Guarantees of Origin (REGO) certification, which provides transparency about the proportion of electricity that suppliers source from renewables[17].

At this time, the green energy supply is only available to the sites that SECAmb owns, and not those that are leased, as the landlord is the decision maker at these sites. However,

[17] One REGO certificate is issued per megawatt hour (MWh) of eligible renewable output to generators of renewable electricity. Source: https://www.ofgem.gov.uk/environmental-and-social-schemes/renewable-energy-guarantees-origin-rego

moving to a REGO certified energy tariff for the buildings we own, would reduce emissions associated with electricity consumption by 86% compared to our 2019 emissions baseline. Despite the reduction benefit from the green tariff, we will still continue to invest in improving the efficiency of our estate as mentioned above.

The transfer to a green tariff will begin in October 2023, and from October 2024 we will have the choice to explore more green energy options. LASER offers an innovative approach to green energy called the Green Basket, which allows customers to buy directly from renewable generators from the suppliers' portfolios. SECAmb will be able to choose whether to buy 100% of our electricity from the Green Basket or remain with REGO, or whether to split our energy demands between the two.

Another benefit of LASER's green tariff is the offer of Power Purchase Agreements, which allows consumers to sell electricity produced from on-site renewables back to the grid. This will be of great benefit to SECAmb in the event that on-site solar PV is installed, whereby any excess electricity produced could be sold back to offset costs.

8.2.3 Green Infrastructure

Discussions with our staff and ICB colleagues has highlighted a number of potential initiatives in response to the growing need for sustainability. In considering the retrofitting and offsetting needs of our estate, green infrastructure has been identified as an intervention with strong potential. As well as environmental impact, green spaces have proven health benefits, including improved psychological wellbeing, reduced blood pressure and stress levels, and enhanced mood[18]. As an example, our colleagues in the Oxford Health NHS Foundation Trust promotes mental health awareness through their green spaces appeal, which makes use of 80 hectares of green space owned by the Trust. This space includes insect-friendly wildflower habitats and around 800 trees, which sequester over 16 tCO_2 annually. Implementing a similar programme across our own sites would significantly contribute to our offsetting needs and would save on the costs associated with the purchase of offsetting credits.

Other Ambulance Services have also provided plans and proposals for how they intend to improve their sites' sustainability, offering potential for collaboration and knowledge sharing. The Yorkshire Ambulance Service (YAS) have created an 'Ambulance Station of the Future' plan (figure 16), detailing a series of interventions that could be installed to improve the sustainability of their estate. As well as health and carbon benefits, the implementation of green spaces can also provide natural shading and cooling, and wildflower habitats can be incorporated with sustainable drainage systems (SuDS).

[18] Green spaces do wonders for your mental health - Oxford Health NHS Foundation Trust

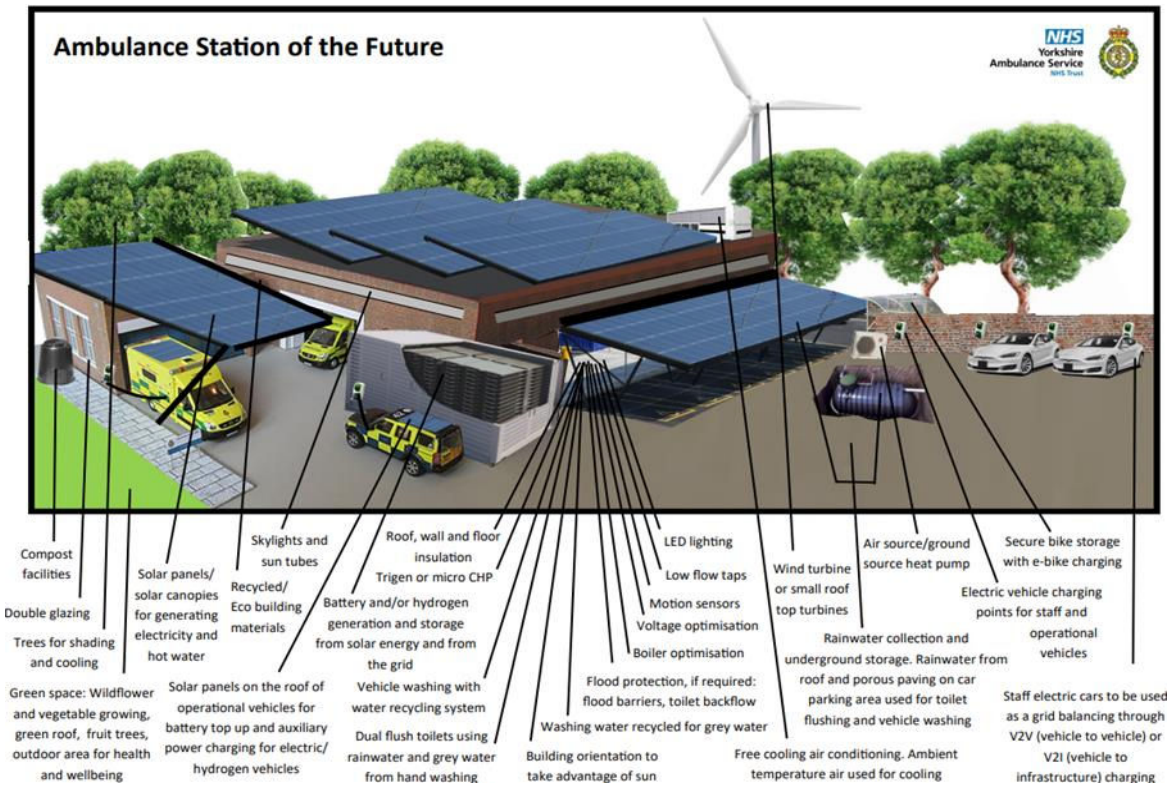


Figure 19 Yorkshire Ambulance Service's 'Ambulance Station of the Future'

Taking inspiration from colleagues like YAS, SECAmb are always looking for opportunities to learn and find new innovative ways we could improve our building stock and improve the quality of life for our people, our neighbours and the planet.

9 Medicines and Consumables

Based on the 2019/20 baseline analysis, Medicines and Consumables contributes 10% of our total carbon footprint. Entonox, which is a medical gas used for acute pain relief, is responsible for around 97% of emissions associated with Medicines and Consumables, alongside water usage (2.3%) and waste (0.7%).

This chapter addresses decarbonisation opportunities for medicines and consumables by designing and implementing operational changes. We also present decarbonisation opportunities which may not necessarily have a direct impact on our carbon footprint but aim to generate support and participation from staff on the ground.

These changes will be visible and will communicate the important message that SECAmb and its leaders are focused on achieving net zero. The projects aim to connect people and invite collaboration, engagement, and commitment. The workforce and systems leadership chapter will provide more details on how our organisation will mobilise to achieve net zero.

To achieve our near-term target, we will need to reduce our emissions associated with medicines and consumables by around 84 tCO_2e per year. However, we aim to exceed this in our annual targets. Based on a 50% reduction scenario, we aim to achieve an annual reduction of 200 tCO_2e from our Entonox; this is an estimated target based on our current Entonox data and may change once data gathering processes have improved.

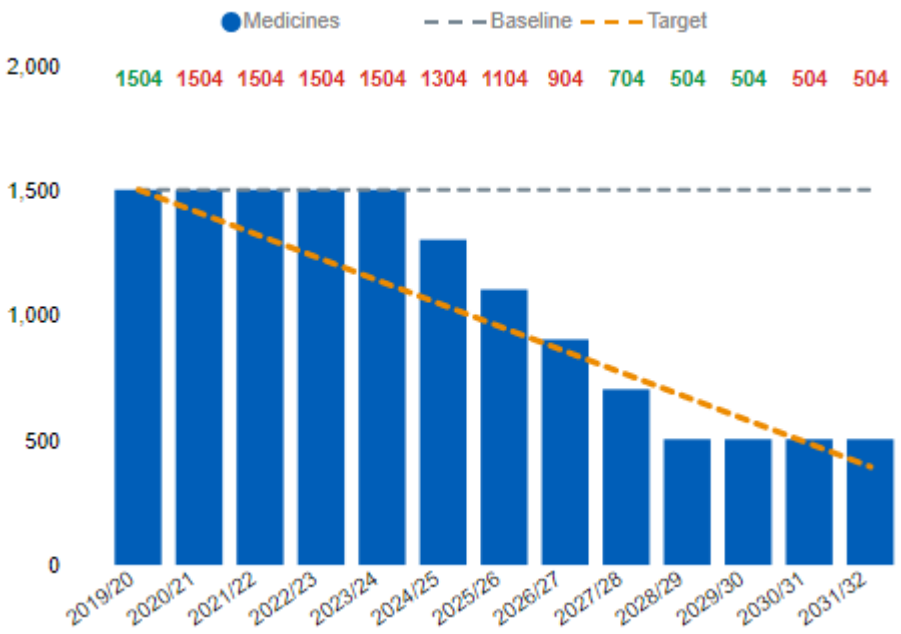


Figure 20 Decarbonisation trajectory for Medicines and Consumables

9.1 Existing Reduction Initiatives

Entonox, otherwise known as 'Gas and Air', is a medical gas made up of 50% nitrous oxide (N_2O) and 50% oxygen. N_2O is a greenhouse gas with a global warming potential of 300 times that of carbon dioxide, and the continuous exposure of healthcare practitioners to Entonox is a significant health risk. Surrey Heartlands has set SECAmb a KPI to address N_2O emissions in line with the NHS Standard Contract.

Key Performance Indicators set by Surrey Heartlands ICB

1. *Reduce the emissions associated with the use of nitrous oxide, in line with the 2022/2023 Standard Contract: Ensuring that 75% of Trusts who use N_2O have carried out and acted on a waste review, including measurement of clinical use compared to supply.*

The Green Plan defines two interlinked projects which both need to be implemented to allow SECAmb to reduce emissions from N_2O. Project 1 is designed to improve track and trace and data quality. Once this has been implemented, Project 2 will commence, which will involve designing and rolling out decarbonisation measures.

9.1.1 Stock Management

The key objective of this project is to eliminate stock control issues and improve the measurement of clinical use compared to supply. There is currently a lack of reliable data, meaning that informed decision-making cannot be carried out effectively. By resolving this, we create opportunities to:

- Reduce SECAmb's risk profile around stock oversight and supply-and-demand gap;
- Pro-actively reduce CO_2e emissions associated with the use of N_2O;
- Minimise unnecessary costs; and
- Respond to and demonstrate progress in relevant KPIs set by our ICBs.

9.1.1.1 The Challenge

Entonox and oxygen are currently used by SECAmb as medical gases, supplied to the Trust in cylinders by the medical gas supplier BOC. Each cylinder has a unique identification code which BOC use upon supply and return to trace their location. However, whilst they are in the possession of the Trust, their movement and use are much more difficult to trace due to a lack of governance and oversight on stock management.

The emissions associated with Entonox usage represents 10% of SECAmb's total carbon footprint. The lack of good quality data on SECAmb's gas consumption and returned cylinders introduces uncertainty into the 2019/20 CO_2e footprint calculation. As it stands, around 1,103 cylinders were estimated in 2023 to be unaccounted for, 20% of which were Entonox. Additionally, each cylinder is rented by SECAmb from BOC and are chargeable, meaning that any missing cylinders result in a financial loss. These untracked cylinders present a potential health and safety risk to our staff and our patients and needs to be

addressed urgently. Improving our track and trace system will make great strides in overcoming these challenges.

SECAmb's baseline emissions for Entonox were calculated based on the number of returned cylinders. This means that, with the current uncertainty around stock management, the data presented may not be fully representative of SECAmb's actual medical emissions.

9.1.1.2 Proposed Solution

We have defined two projects to address the emissions and risks associated with Medicines and Consumables. Project 1, which consists of two workstreams, is described in more detail below and addresses the root of the stock management issue. This phase will also provide the building blocks for Project 2, including improved access to data to inform decisions and deliver net zero targets. Project 1 will take place in the near-term over the next three years, after which Phase 2 will begin.

Organisational Risk /Issue Identified	Proportion of Risks Addressed per Phase		Anticipated Benefit of Mitigation
	Phase 1	Phase 2	
Corporate Risk Register: Risk ID 105 Medical Gas Reconciliation. This includes organisational and patient risk.	100%		Reduced organisational and patient risk.
Environmental impact of N_2O emissions must be addressed in order to achieve NHS net zero targets.	20%	80%	Substantially contribute to delivering NHS net zero targets.
Unnecessary costs.	100%		Reduce unnecessary costs by 10% per annum.
Poor stock management data.	100%		Improved availability of reliable data to help make informed decisions.
Low reliability around carbon footprint and baseline data.	100%		Improved reliability of baseline data and progress towards targets, protecting image and brand.
Evidence of SECAmb's progress in responding to Surrey Heartlands' KPIs.	70%	30%	Successfully meet ICB's KPIs, demonstrating professionalism.
Poor oversight of medical gases adversely impacting on SECAmb's services, which is especially important during peak times.	100%		Improved levels of patient care during peak times, such as winter or periods of high COVID-19 infection rates.

Table 10 Identified risks and anticipated benefits of proposed interventions.

9.1.1.3 Indicative and Recommended Timeline

Project 1 will commence in 2023 and is anticipated to end in December 2024. Project 2 will subsequently commence at the beginning of 2025 and will take approximately three years to complete.

Figure 21 Indicative timeline for Entonox emissions reduction initiatives

9.1.1.4 Phase 1a – Improve Track and Trace

This project responds to issues around current internal governance, procurement, and stocktake systems of medical gas cylinders with an aim to mitigate the health and safety risks and reduce costs of unreturned cylinders. The aim is to understand the current movements and assign roles and responsibilities at each stage of the process with a view to return all cylinders.

BOC have developed a stock management app called Accura, which allows their customers to track and trace in-use cylinders rented from BOC. It uses a cloud-based system to improve utilisation, reduce gas wastage, and ensure traceability, and allows users to display the data in accessible reports. The app makes use of the same barcode system that BOC use when delivering or returning cylinders, allowing the Trust to scan all cylinders into individual stations and vehicles to ensure that there is full oversight of stock at all times. If a cylinder is unaccounted for, it will be written off the system and a financial charge will be issued.

The Accura app is an essential first step in rewriting our procurement and stocktake system. The app allows users to specify minimum and maximum stock levels, sending automatic notifications when these limits are reached. It also shows when medical gas has been moved, who by, and when, and can identify areas of higher or lower use to allow for more efficient supply distribution. The periodical stock check function allows for the early identification of missing cylinders, so that an investigation can immediately be carried out and discrepancies can be reconciled with BOC. Staff will also be able to identify cylinders that are due to expire and either rotate them to be used or return them to BOC, allowing for better control of our medical gas supply and limiting unnecessary spend.

Upon implementation of the Accura app, three stocktakes would be undertaken within the initial 4 week period to assess the current distribution and use of our existing stock. A representative from Accura will need to be employed by the Trust to oversee the implementation process.

Additional SECAmb resources required for app implementation include:

- A Band 7 Make Ready Centre Manager (MCRM) to dedicate three days per week to the implementation process. This will include three months for preparation, 6 months for introduction, and an additional three months to review and embed the new track and trace system into daily operations.
- A Band 6 Medicines Systems Lead to support the Accura representative and MCRM in the 12 month implementation process.
- A Band 4 Medicines Governance Administrator to support MRCMs in the onboarding of staff to the Accura app.

The Accura app is a simple solution to cylinder tracking and stock management. It is a web-based programme that records all cylinder movement on-site, displayed in easy-to-read dashboards and reports. It provides up-to-date information on cylinder activity, as well as offering multi-location scanning, stocktake functionality, and cylinder performance reporting.

The app will bring a number of benefits to the Trust by increasing cylinder productivity and improving traceability. This will allow us to better understand the number of cylinders needed for normal operations, reducing unnecessary spend and risk of fugitive emissions. It will also reduce our overall risk level by providing expiry notifications and identifying potentially hazardous gases in emergency situations. A total estimated reduction of 5-10% in annual rental spend is anticipated once the app has been implemented.

Other additional benefits include the mitigation of risks stated in the Corporate Risk Register, and improved central oversight of medical gases. The latter is especially important during peak times, such as winter or periods of high COVID-19 infection rates.

9.1.1.5 Phase 1b – Update Entonox Footprint and Trajectory

Once the actual consumption has been established, the baseline will be reviewed using the supplied methodology. This will allow a more accurate decarbonisation trajectory to be established, which we can use to confirm our annual targets. This exercise can be done by the internal SECAmb sustainability resource as part of its periodic GHG monitoring and reporting without any additional costs.

9.1.1.6 Phase 2 – Reduce Entonox Usage

Successful delivery of Project 1 will ensure that SECAmb will have a robust track and trace system in place to provide reliable data. Availability of trusted data and assurance is critical to update the Trust's carbon footprint, and will form the basis for Project 2: designing initiatives to reduce emissions associated with Entonox usage.

Initial planning has identified a potential intervention that could be rolled out which involves the transition to using alternative medical gases. Methoxyflurane, otherwise known as Penthrox, is an inhalation vapour with a liquid active ingredient which is often used as an alternative to Entonox. Its global warming potential is significantly less than that of Entonox, and has an atmospheric lifetime of 54 days, compared to N_2O's 114 years[19]. However, there are significant limitations in the use of Penthrox, with many patients unable to receive it due to incompatible health conditions[20]. This means that Entonox would need to continue to be stocked so that these patients can continue to receive pain relief.

In addition, rather than cylinders, it is administered in single-dose inhalers, often referred to as the 'green whistle'. These are non-reusable, and therefore would have a significant impact on our waste production. Some countries use sterilisation processes that allow them to reuse medical plastics[21], but the UK does not currently employ these practices. Furthermore, if Penthrox is to be introduced as a regular part of our operational practices, some organisational changes will need to be made to ensure it can be used. The use of Penthrox is currently limited to members of staff who are registered to administer it, meaning that our crews are not currently equipped for the transition. In order to make it a

[19] Raju, P. and Hickman, J. (2020). Sustainability: Medical gases. Royal College of Anaesthetists.
[20] National Institute for Health and Care Excellence (2023). Methoxyflurane.
[21] Joseph, B., James, J., Kalarikkal, N. and Thomas, S. (2021). Recycling of medical plastics. Advanced Industrial and Engineering Polymer Research.

viable solution, its use will need to be extended to non-registered staff, and efforts will need to be made to ensure that our staff are sufficiently trained in its administration.

While keeping all of this in consideration, rolling out Penthrox as an alternative analgesic may be a temporary solution to our current emissions. Many pharmaceutical companies are investigating new, sustainable alternatives to the medical equipment we currently use. This is a point which needs further consideration and planning, and SECAmb will continue to monitor ongoing research and initiatives, and explore these opportunities as they present themselves.

9.1.2 Waste Reduction

The total volume of emissions resulting from SECAmb's waste comes to around 10.1 tCO_2e per annum. Of this, around 0.45 tCO_2e is attributable to clinical waste.

The NHS Standard Contract includes a series of requirements that Trusts must adhere to. This includes:

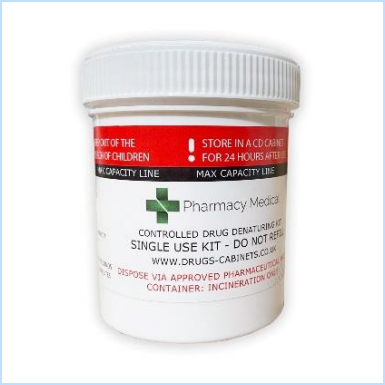
- Reducing avoidable single use plastic products;
- Ceasing the use of plastic cutlery, plates, and cups on the premises; and
- Reducing the use of single use plastic food and beverage containers on the premises.

The waste we produce from our clinical practices may be slightly more difficult to address than our Entonox usage. Much of this waste will result from single-use plastics which are used nationally to limit the risk of cross-contamination between patients. However, as more reusable and multi-functional alternatives reach the market, there is an opportunity for SECAmb to lead the way in trialling new products.

Discussions with our staff and ICB colleagues have identified a number of opportunities to reduce our waste and mobilise colleagues to support and co-create new solutions.

Case Study: DOOP Kits

Disposal of Old Pharmaceuticals Kits (DOOP Kits) are used for the safe disposal of controlled drugs that have been drugs that have been administered to our patients. Also known as denaturing kits, these are typically single-use plastic pots which contain a tablet, powder, liquid, or ampoule capable of breaking down hazardous or non-hazardous medicines. These plastic containers are disposed of after use as pharmaceutical waste, meaning that they are incinerated. This has a high emission potential which SECAmb is committed to addressing.



At the end of 2022, SECAmb began trialling an alternative DOOP Kit which is multi-use, reducing the volume of plastic being disposed of and incinerated as medical waste. This trial was considered a success, and an evaluation of the results was presented to our internal Medical Governance Committee in February 2023.

This marks just one of many new products that SECAmb has the opportunity to incorporate into our daily operations.

10 Workforce and Systems Leadership

10.1 Becoming a Sustainable Organisation

The Green Plan is only the start of our net zero journey. To ensure that the plans and initiatives we have developed succeed, it is important that every team works together to ensure that these measures benefit our organisation as a whole. It is the responsibility of our leadership to engage and influence our colleagues and equip our workforce with the skills and resources needed to deliver our sustainability goals.

Decarbonisation is a lengthy process, and requires engagement from our entire workforce and system partners to be effective. The next stage of our journey will be to publish our Net Zero Roadmap, which will set out annual targets stretching from now through to 2045. The primary focus of the Roadmap will be on decarbonising our Scope 1 and 2 emissions, which make up the bulk of our carbon footprint. Once this is achieved, we will have an additional five years to address our indirect emissions.

A number of our existing strategies and policies will need to be revised, including our Fleet Strategy, Estates Strategy, and Lease Car Policy, embedding the Green Plan into their processes. In addition to this, the NHS Standard Contract 2022/23 sets out a series of initiatives that Trusts must abide by in order to achieve a sustainable health service. This includes:

- The nomination of a Net Zero Lead to oversee sustainability initiatives; and
- Consideration given to the wider social, economic and environmental benefits of the purchase and specification of products and services.

10.2 Sustainable Procurement

At this time, procurement is largely out of scope of the NHS Carbon Footprint. However, there is still significant opportunity to reduce our Scope 3 emissions, including from our supply chain. One way that we can influence our Scope 3 emissions is through the selection of green suppliers, particularly those that use ZEVs and ULEVs for their deliveries. It is important that we as the consumer encourage our suppliers and service providers to make sustainable decisions, either through choosing green contracts or moving to more environmentally conscious providers.

As an NHS Trust, our first priority will always be to ensure that our patients receive the best care possible, and as such we must ensure that any procurement decisions will not impact our operational abilities. Workforce behavioural changes will be essential in delivering our net zero targets, especially for our Medicines and Consumables.

To support in the decarbonisation of our Medicines, we need change the culture around our Entonox usage. This includes an interrogation of our decision-making around the administration of Entonox to patients, and identifying how we can move away from its use without impacting patient care. This is a principle that can be applied to all aspects of procurement, and will influence other Scope 3 sources, such as waste and water consumption.

10.3 Green Champions

In the process of identifying and planning our intervention strategy, we met with a number of Advocates and Champions across our ICSs. Discussions further highlighted the need and desire for Green Champions to take charge of collecting data and monitoring the progress of interventions. This responsibility may be extended to the creation of a dedicated Sustainability Team, who can oversee the implementation and progress of our initiatives across all workstreams.

In 2023 our Green Staff Network published a Green Champion Handbook, defining the role of a Green Champion and providing essential guidance on their responsibilities. It also provides comprehensive, accessible information on the importance of sustainability, the science of climate change, and the policies which determine how we address our own emissions. This is an excellent first step to communicating the importance of sustainability to our staff and embedding net zero into our operations.

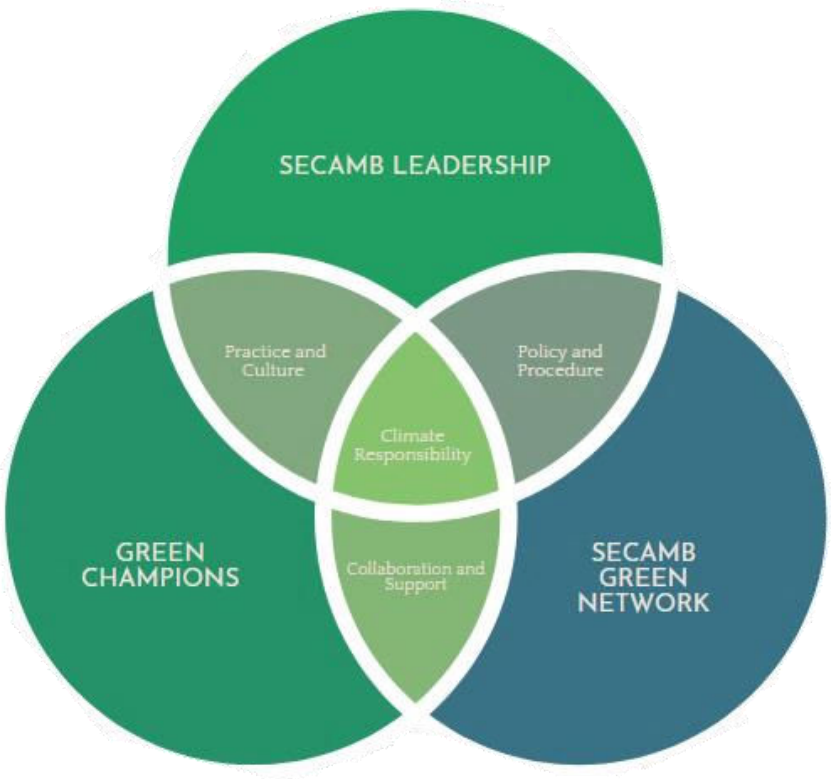


Figure 22 The role of a Green Champion

We will endeavour to influence the behaviour of our colleagues and suppliers to encourage sustainable practices, ranging from recycling and bicycle schemes for our staff, to adding sustainability requirements to our procurement contracts. Though this is unlikely to have a significant impact on our footprint as a whole, it is a means of encouraging our staff to think about how we as a community can help in our net zero journey. We will continue to work with our ICBs to ensure that our targets and approaches are aligned and, where possible, help them to achieve their own objectives. A number of Green Champions will be selected

across our Trust to advocate for the Green Plan and use their understanding of our operational processes to inform sustainable practices.

10.4 Green Staff Network Initiatives

Green Staff Network Initiatives are smaller interventions that will contribute to our overall decarbonisation efforts by changing our current ways of working. These will be actioned by our Green Champions and will ultimately help to pave the way for greater initiatives in the future. With them, we aim to improve communication around sustainability issues within the Trust and provide our staff with a sense of control, ownership, and understanding.

10.5 Tracking and Measuring Success

Critical to delivery is to understand the impact of interventions on our decarbonisation trajectories, and to be able to learn quickly what is working and what is not. A robust monitoring and reporting process has been established that will allow us to track our net zero progress. To ensure that this is carried out and reported correctly, several individuals will need to be identified to take responsibility for ensuring that the process is adhered to.

This is likely to fall to our dedicated Sustainability Team; however, it is important that we have representatives from each of our operational teams who understand the process and are capable of gathering the data needed. This highlights the importance of our Green Champions; those whose roles are not dedicated to sustainability, but who care about and advocate for our net zero journey.

10.6 Training

To ensure interventions are successful, we need to make sure that they are easy for our staff to adopt. This means implementing strategies that will not significantly impact the way our staff work, and finding ways to incentivise changes. As an example, we plan to conduct a waste review and identify areas for improvement. This will include implementing incentives such as competitions between our ambulance stations to encourage uptake and reward participation.

Training will be delivered to help our workforce understand these new processes, and will include the reasons for the development of the Green Plan, how it aligns with local, national and international objectives, and the programme for implementation. Additionally, in line with KPIs set by our ICSs, a number of our Estates team will be enrolled in accredited carbon literacy training. This will further drive home the importance of net zero and sustainability, and equip our staff with the skills they need to identify changes that need to be made and how to enact them.

10.7 Roles and Responsibilities

Implementation of these measures will require strong and clear governance. Everyone will have a role to play in addressing our emissions, and it is important that everyone understands what those roles are. As such, a clear organisational and governance structure has been set out to help full-time employees understand who will undertake each role, and who they can turn to for support. This includes the appointment of new full-time employees (FTE) to fulfil specialised sustainability roles.

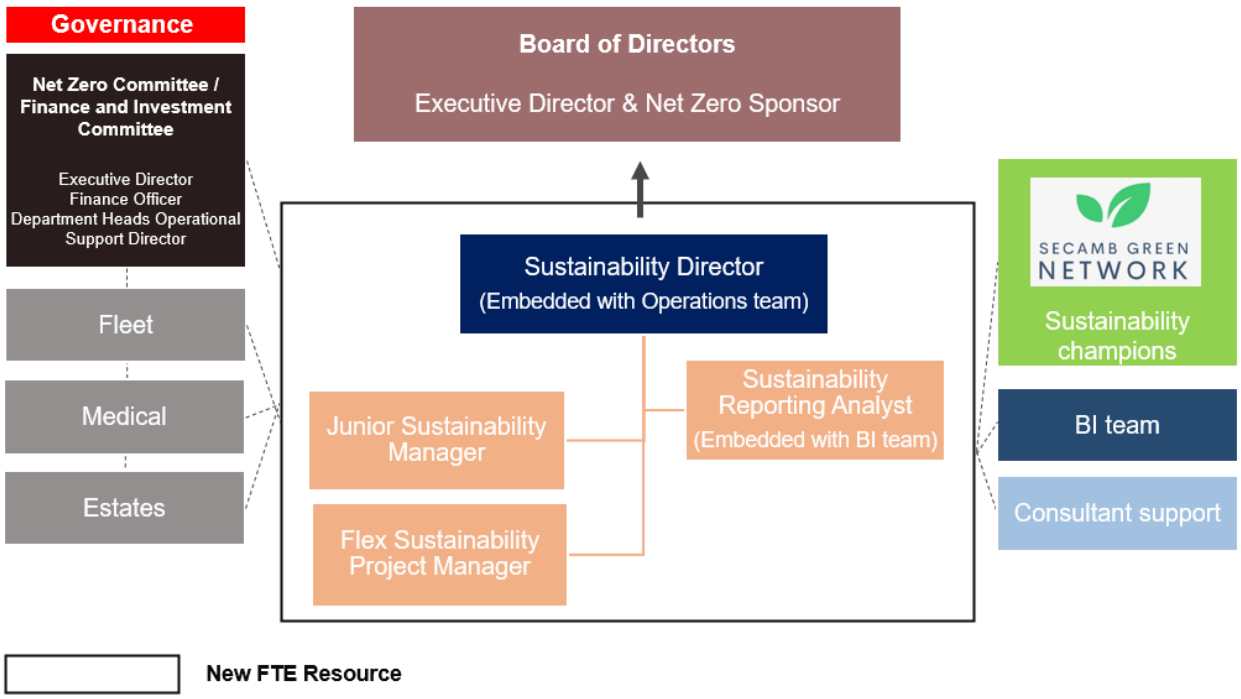


Figure 23 Organisational structure of SECAmb's sustainability initiatives

Roles:

- **Board of Directors** – The Board of Directors shapes a company's sustainability strategy by setting high-level goals, overseeing their implementation, and ensuring that sustainability is integrated into the broader corporate strategy and culture. They also have the responsibility to evaluate and manage sustainability-related risks and opportunities.
- **Net Zero Committee** – Drives the delivery of a company's ESG strategy. Key Functions include, overseeing implementation, monitoring and reporting, risk management, policy development, engagement, advising the board.
- **Executive Director & Net Zero Sponsor** – Accountable for delivery of company's sustainability strategy
- **Sustainability Director** – From within the Operations function, this person is responsible for implementation of the Sustainability Strategy including executing the company's sustainability strategy, ensuring its effective implementation across all business units, and engaging with internal and external stakeholders (including fleet, estates and medical) to promote sustainability goals and initiatives.
- **Sustainability Reporting Analyst** – This analyst function will be embedded within the BI team. The function is responsible for coordinating and preparing GHG inventory, reports on a company's sustainability initiatives, achievements, and impacts. They also ensure the company's compliance with relevant sustainability reporting standards and guidelines and facilitate communication of sustainability performance to stakeholders. They would work closely with the Sustainability Director and Junior Sustainability Manager.
- **Junior Sustainability Manager** – This role supports both Sustainability Director, Sustainability Reporting Analyst and Flexible support, providing implementation support, insights and analysis to both roles.
- **Flexible Sustainability Project Manager** – This function is flexible and should be directly aligned to specific specialized decarbonisation projects, which could be in Fleet, Estate, Medical or other. Costs for this resource should be embedded within capital budget for the project and considered at business case stage. Depending on capability and capacity need and skill requirement, this resource could be both and internal depending on the characteristics of the project.
- **Sustainability Champions** – As part of the Green Network, these champions aim to drive engagement, facilitating implementation of sustainability practices, and fostering a culture of sustainability within the organization.
- **Consultant Support** – Providing expert guidance on best practices, helping set and track progress towards targets, and offering third-party assessments to ensure alignment with global standards and regulations.

Governance Structure:

- **Establish a Regular Reporting Cycle:** These can be quarterly or more frequent depending on the organisation's needs and the pace of ESG initiatives. This is designed to improve communication in the form of, for example, quarterly emissions reports, Fleet and Estates implementation updates, etc.
- **Incorporate Net Zero Strategy into Board Meetings:** Include Net Zero as an agenda item in every board meeting. This will ensure that updates are regularly addressed and are given the necessary visibility at the board level. This also helps to establish Net Zero an integral part of business strategy.
- **Use Net Zero Dashboard:** A visual tool to communicate key metrics and updates in a simple format. This should be part of the regular reports the Executive Director presents to the Board.

Project description	Internal lead
Improve internal communication around the impact of current and planned initiatives. During discussions, people have shown an interest in the impact of such initiatives, including the installation of recycled water systems and solar PV at various sites. Examples like this offer an opportunity to engage and create discussions around new solutions, bringing with it a sense of ownership over the changes.	Executives
SECAmb does not currently provide cases for organisational mobile phones, resulting in frequent breaks and replacements. In 2022, 51 phones needed replacing as a result of damage that could have been avoided by providing staff with protective cases.	Executives
Green tags used in operations are often not recycled, and staff have asked for support in addressing this. Incentives have been suggested to increase recycling rates, such as competitions.	Executives
SECAmb currently only provides a limited number of reusable cups, meaning that many people are still required to use plastic disposables. As part of the 2022/23 Standard Contracts, Trusts have been asked to cease the use of plastic cutlery, plates and cups on all premises. More reusable cups, cutlery and plates need to be introduced in order to reduce waste, and the use of disposal milk pods and other similar products needs to be ceased.	Executives
Make Ready Centres are not currently purpose-built and require improvements in order to make them fully fit-for-purpose and comfortable for staff to work in. This may range from the installation of purpose-designed door systems, to improved insulation and heating.	Make Ready Centre Managers and Estates & Facilities Team
Reduce the packaging associated with consumables and ensure that any packaging is recyclable where possible, avoiding the use of plastics. Engage with suppliers and encourage the use of sustainable alternatives.	Executives
The waste management systems in the backs of our DCAs are flawed. This means that a lot of recyclable waste is incinerated alongside medical waste. Alternative means of disposal need to be implemented in our DCAs to improve recycling rates and reduce emissions associated with waste production.	Executives
As well as electrifying our main service operational fleet, there is also an opportunity to transition our logistics vehicles. These are used for moving and delivering our consumables and presents an opportunity to reduce our Scope 3 emissions.	Fleet & Operational Support Managers

Table 11 Summary of proposed projects and initiatives to improve sustainability within Medicines & Consumables

11 Next Steps

To ensure success and minimise operational impact, we plan to carry out a combined approach to decarbonising our Trust. As of 2023, the following are just a few of the pieces which have been developed to aid in this process:

- Fleet Transition Plan and Targets
- Fleet Demand Analysis and EVCI Supply Analysis
- Estates Retrofit Prioritisation
- EVCI and Fleet Prioritisation

Following the completion of the short-term interventions, an investigation will be carried out into the procurement of our fleet. This will be followed by a review and expansion of our EVCI Optioneering and Implementation Plans to include wider locations within SECAmb's estate. This will be continuously reviewed and re-prioritised as we progress through to 2030.

11.1 Three Year Plan

Over the next three years we aim to reduce our emissions by 2,463 tCO_2e – 821 tCO_2e per annum. This is in line with the current 50% reduction target, and will be achieved through initiatives across all of our operations.

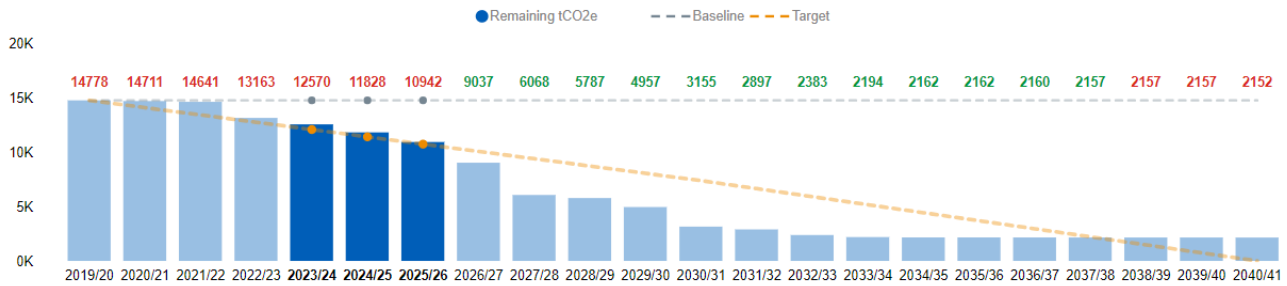


Figure 24 Our decarbonisation trajectory: Three Year Plan

The interventions listed below have the potential to deliver a reduction of 4,979 tCO_2e, which is in excess of our target by 2,516 tonnes. This puts us well ahead of our trajectory. The progress of these interventions will be reviewed in our Green Plan 2026-2029, at which point the next stage of our decarbonisation journey will commence.

Intervention	Workstream	Timeframe	Estimated emissions reduction (tCO_2e)	Carbon footprint after implementation (tCO_2e)
Deliver replacement targets	Fleet	2023-26	2,342	12,330
Deliver EVCI targets	Fleet	2023-26	0	12,330
Deliver Estate retrofit interventions	Estate	2023-26	1,099	11,231
Transfer to green energy	Estate	2023	838	10,393
Procure app & reduce Entonox usage	Medicines	2023-26	700	9,693
One Green Staff Network intervention each year	Green Network	2023-26	To Be Determined	To Be Determined

Table 12 Summary of proposed projects and initiatives for the next 3 years to meet reduction targets

List of Abbreviations

Abbreviation	Definition
AS	**Ambulance Station**, used to store ambulance vehicles and their medical equipment.
Baseline	A starting point used for comparison. For the purpose of this report, **'baseline'** refers to the emissions reported by SECAmb for 2019/20 financial year.
Battery Storage	**Battery storage** refers to devices that enable energy from renewable generation to be stored and subsequently released when consumers require additional power.
BEIS	**The Department for Business, Energy and Industrial Strategy** was a governmental department which served to define industrial regulations around energy, clean growth, and climate change. The Department has since been dissolved and replaced by the Department for Energy Security and Net Zero.
Carbon	**'Carbon'** is used as an umbrella term to refer to greenhouse gas emissions in the context of this report.
Carbon Footprint	A measure of the amount of greenhouse gases released into the atmosphere as a result of the activities of a particular individual, organisation or community. For the purpose of this report, the **carbon footprint** encompasses all CO_2e emissions within the scope of reporting.
CFCs	**Chlorofluorocarbons** are halogenated hydrocarbons that contain carbon, hydrogen, chlorine, and fluorine, often used as solvents and refrigerants, which typically have high ozone depletion potential.
CH_4	**Methane** (CH_4) is one of the seven greenhouse gases included in the Kyoto Protocol.
CHP	**Combined heat and power** boilers produce both heat and electricity in one single process.
CIBSE	The **Chartered Institute of Building Services Engineers.**
CO_2	**Carbon dioxide** is one of the seven greenhouse gases included in the Kyoto Protocol.
CO_2e	**Carbon dioxide equivalent** is the universal unit of measurement to indicate the global warming potential of greenhouse gases, expressed in terms of the GWP of one unit of carbon dioxide.

DCA	**Dual Crewed Ambulance**, also referred to as an Emergency Ambulance, is a fully equipped and liveried ambulance, crewed by staff trained to deliver clinical care at the incident scene and capable of transporting the patient to hospital or another location.
Decarbonisation	Reducing or eliminating the production of greenhouse gas emissions from an organisation or community's activities.
DNO	A **Distribution Network Operator** is a company licensed to distribute electricity in the UK via towers, cables and meters.
DOOP	**Disposal of Old Pharmaceuticals kits** are kits used to safely dispose of old or otherwise unusable controlled pharmaceuticals.
Emissions	For the purpose of this report, this refers to the release of greenhouse gases into the atmosphere.
Emissions Factor	A factor that converts activity data (from a unit of available activity data, such as kg CO_2e per litre of fuel consumed) into GHG emissions data relative to the intensity of an activity, used to calculate a carbon footprint.
Entonox	**Entonox**, otherwise known as ‘Gas and Air’, is a medical gas consisting of 50% nitrous oxide and 50% oxygen, used for acute pain relief.
EPC	**Energy Performance Certificate**, used to indicate the energy efficiency of a given site.
ERIC	**Estates Returns Information Collection**, used to collect information relating to the costs of providing and maintaining the NHS Estate.
EV	An **Electric Vehicle** is a vehicle that uses electric motors for propulsion, rather than a traditional internal combustion engine.
EVCI	**Electric Vehicle Charging Infrastructure** refers to the charging points installed at key sites that can be used to refuel the EV fleet.
FERA	**Fuel and Energy-Related Activities** are activities not included in Scope 1 or 2, including the extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling that is consumed by SECAmb.
FY	The **Financial Year** (April-March) is the period of time used in this report to calculate annual emissions.
GHG	**Greenhouse Gases** are gases that absorb and emit radiant energy, contributing to global warming. The Kyoto Protocol identifies seven key greenhouse gases: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6 and NF_3.

	For the purposes of this standard, GHGs are the six gases listed in the Kyoto Protocol: carbon dioxide (CO2); methane (CH4); nitrous oxide (N2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulphur hexafluoride (SF6).
Greenhouse Gas Protocol	The **GHG Protocol** establishes comprehensive global standardised frameworks to measure and manage greenhouse gas emissions from private and public sector operations, value chains, and mitigation actions.
GWP	**Global Warming Potential** is an index, based on radiative properties of a greenhouse gas, measuring the radiative forcing following a pulse emission of a unit mass of a given GHG in the present-day atmosphere integrated over a chosen time horizon, relative to carbon dioxide.
HART	A **Hazardous Area Response Team** is a group of paramedics who are trained to enter hazardous incident sites.
Hear & Treat	Describes the scenario in which 999 and 111 calls are successfully completed without despatching an ambulance vehicle response.
Heat Pump	A device that can heat a building or part of a building by transferring thermal energy from the outside using a refrigeration cycle.
HFCs	**Hydrofluorocarbons** are manmade organic compounds that are classed among the seven greenhouse gases included in the Kyoto Protocol.
HVAC	**Heating, Ventilation and Air Conditioning** systems are responsible for maintaining the ambient temperature and air quality of a building.
Hydrogen Fuel Cell	**Hydrogen fuel cells** produce electricity by combining hydrogen and oxygen to produce electricity, water, and heat.
ICS	An **Integrated Care System** is a partnership of organisations within the NHS that come together to plan and deliver joint health and care services. SECAmb's ICSs include Surrey Heartlands, Sussex, Frimley, and Kent & Medway
$kgCO_2e$	**Kilogram of carbon dioxide equivalent**, a unit of measurement used in the quantification of GHG emissions.
KPI	**Key Performance Indicator**, used to refer to key targets which serve to guide business decisions.
kWh	**Kilowatt hour** is used as a unit of measurement of energy consumption.

kWp	**Kilowatt peak** is a unit of peak power output of a system, commonly applied to solar photovoltaic arrays. For example, a solar panel with a peak power of 5 kWp which is working at its maximum capacity for one hour will produce 5 kWh.
Kyoto Protocol	An international treaty which operationalises the United Nations Framework Convention on Climate Change by committing industrialised countries and economies in transition to limit and reduce GHG emissions in accordance with agreed individual targets.
LED	**Light-emitting diode**, an energy-efficient form of lighting.
Location-based electricity	A method to quantify Scope 2 GHG emissions based on average energy generation emission factors for defined locations, including local, subnational, or national boundaries.
LTHW	**Low temperature hot water** heat distribution networks reduce the amount of energy lost in converting and transporting energy to buildings.
Market-based electricity	A method to quantify Scope 2 GHG emissions based on those emitted by the generators from which the reporter contractually purchases electricity bundled with instruments, or unbundled instruments on their own.
Medical Gas	A **medical gas** is a single or mixed gas that is manufactured, packaged, and intended for administration to a patient in anaesthesia, therapy, or diagnosis.
MRC	**Make Ready Centre** refers to a site where ambulance vehicle preparation takes place.
MRCM	**Make Ready Centre Manager** is an individual who managed the operations and general running of an MRC.
N_2O	**Nitrous oxide** (N_2O) is one of the seven greenhouse gases included in the Kyoto Protocol.
Net Zero	**Net zero** refers to achieving an overall balance between GHG emissions produced and GHG emissions removed from the atmosphere.
NF_3	**Nitrogen trifluoride** (NF_3) is one of the seven greenhouse gases included in the Kyoto Protocol.
NHS SBS	**National Health Service Shared Business Services** is a joint venture company which provides accounting, procurement, payroll, and IT management services to NHS organisations.

Operational Control	**Operational Control** is defined within the GHG Protocol on the basis that 'A company has operational control over an operation if the former or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation'.
Passivhaus	A standard of energy efficiency within building practices, resulting in 'ultra-low energy buildings' which require little energy for space heating or cooling.
Penthrox	Otherwise known as **Methoxyflurane**, an inhaled analgesic primarily used to treat acute pain.
PFCs	**Perfluorocarbons** are manmade organic compounds that are classed among the seven greenhouse gases included in the Kyoto Protocol.
PV	**Solar Photovoltaics**, otherwise known as solar panels, are a form of renewable energy that can provide on-site energy generation.
Refrigerants	Chemicals which produce a cooling effect while expanding or vaporising, often used in HVAC systems.
Retrofit	The process of modifying a building's systems or structure in order to improve its sustainability and overall performance.
RFI	**Request for information**, referring to the requests made for the data used in this report.
Scope 1	Direct emissions from owned or controlled sources. SECAmb reports based on operational control; therefore, in the context of this report, **Scope 1** refers to activities in which SECAmb has operational control.
Scope 2	Indirect emissions from the generation of purchased electricity, or imported steam, heating or cooling.
Scope 3	All indirect emissions not included in Scope 2 that occur in the value chain of the reporting company, including both upstream and downstream emissions.
SECAmb	**South East Coast Ambulance Service.**
See & Convey	Describes the scenario in which patients are required to be transported to hospital in order to receive treatment.
See & Treat	Describes the scenario in which ambulance crews are able to successfully provide treatment to patients at the scene of the incident without needing to transport patients to the hospital.
SF_6	**Sulphur hexafluoride** is one of the seven greenhouse gases included in the Kyoto Protocol.

SRV	**Specialist Response Vehicles** are vehicles crewed by medical professionals who are able to provide specialist treatment to patients.
Stationary Combustion	**Stationary fuel combustion** refers to devices which combust solid, liquid, or gaseous fuels, generally for the purpose of generating steam, producing electricity, providing useful heat, or eliminating combustible matter.
Sustainability	**Sustainability**, for the purpose of this report, is defined as meeting the social, environmental and economic needs of the organisation without compromising the future ability to meet operational needs.
T&D	**Transmission and Distribution** refers to the different stages of carrying electricity throughout the grid system, often resulting in a loss of units compared to those initially generated. This is referred to as Transmission and Distribution Loss.
tCO_2e	**Tonnes of carbon dioxide equivalent**, a unit of measurement used in the quantification of GHG emissions.
ULEV	**Ultra-Low Emissions Vehicles** are cars or vans that produce $75gCO_2$/km or less of GHG emissions.
VMC	**Vehicle Maintenance Centres** are sites which serve to repair, maintain and service emergency response vehicles.
WTT	**Well-to-Tank** refers to the GHG emissions resulting from the production, processing and delivery of fossil fuels to the point of use. This is often used interchangeably with FERA.
YAS	**Yorkshire Ambulance Service.**
ZEV	**Zero Emissions Vehicles** are vehicles which use electric batteries or hydrogen fuel cells in the place of a traditional internal combustion engine.

Appendix A

Investment Profile

Combined Investment Profile per Annum (3 Year Outlook)

A high level investment profile has been undertaken to understand the anticipated spend per annum. The combined roadmap below shows recommended initiatives in the near term (up to 2026), after which it is more likely to change.

Intervention	Workstream	Timeframe	Estimated cost (£)
Deliver replacement targets	Fleet	2023-26	Costs for fleet replacements have not been included due to the uncertainty around DCA electrification, which will comprise the majority of the costs.
Deliver EVCI targets	Fleet	2023-26	941,980 (2023/24) 887,432 (2024/25) 1,033,712 (2025/26)
Deliver Estate retrofit interventions	Estate	2023-26	No planned investment (2023/24) 194,215 (2024/25) 253,275 (2025/26)
Transfer to green energy	Estate	2023	19,861
Procure app & reduce Entonox usage	Medicines	2023-26	371,958 (2023/24) 21,540 (2024-onward)
One Green Staff Network intervention each year	Green Network	2023-26	To Be Determined

Table 13 Summary of proposed projects and initiatives for the next 3 years to meet reduction targets, with costing

Estates & Facilities

An estimated investment cost has been calculated for each identified intervention. There is no set annual cost; the figures provided are cumulative, and the rate at which interventions are implemented will depend on prioritisation. Costing has been estimated up until the financial year 2034/35; costing information is likely to change with inflation and should only be taken as an indicative estimate. All projects that are considered to be less financially viable (maximum 400 £/tCO_2e) and have minimal carbon reduction potential have been excluded at this time.

Intervention Type	Lifetime Carbon Savings (tCO_2e)	Total Investment (£)
Grid Greening	12,635	0
ASHP	13,255	4,124,382
Double Glazing	925	311,650
LED	994	508,166
Roof Insulation	2,376	259,651
Solar PV	232	1,079,382

Table 14 Estimated abatement potential and implementation cost for priority interventions

Financial Year	Anticipated Total Investment (£)
2024/25	194,215
2025/26	253,275
2026/27	408,690
2027/28	593,155
2028/29	812,632
2029/30	1,246,832
2030/31	1,169,134
2031/32	1,601,850
2032/33	2,597,078
2033/34	3,009,371
2034/35	324,292

Table 15 Estimated level of investment anticipated for estates decarbonisation over the next decade

SECAmb's transfer to the new green energy contract will be undertaken in October 2023, with an estimated uplift cost of £11/MWh. This places the total estimated uplift cost for switching SECAmb's freehold sites to a green tariff at £19,861.

Total electricity consumption (MWh)	Uplift cost (£/MWh)	REGO cost (£/MWh)	Est. annual cost uplift (£)	Est. REGO certificate cost (£)	Est. total annual cost uplift (£)
1,600.37	11	1.41	17,604.1	2,256.5	19,860.6

Table 16 Estimated uplift cost for switching SECAmb's freehold sites onto a green tariff

Medicines & Consumables

Every year the Trust spends a minimum of £54,000 on items that are unusable but not returned due to the flawed system currently in place.

The anticipated cost of implementation for the Accura app has been calculated, alongside the subsequent annual retention fee.

Cost item	Value	Cost Type	Comments
Cost 1a - Accura App Procurement	£799.00	One-off	
Cost 1b - Accura App License	£21,540	Annual	£1,795 per contract (60)
Cost 2 - Resourcing	Pay: £103,453.65 Non-pay: £4,608	One-off	
Cost 3 – Write-Off Cost	£ 241,557	One-off	£219 per cylinder
Subtotal Cost 1 -Year 1	**£371,958**	**One-off**	
Subtotal Cost 2 - Year 2 Onward	**£21,540**	**Annual**	
Total Savings	**£54,000**	**Annual**	

Table 17 Summary of the costing associated with implementing the BOC Accura app

Fleet

An estimated implementation cost has been calculated for the implementation of EVCI across SECAmb's estate. This assumes that all necessary EVCI will be procured by the end of 2030.

Cost Item	Total Investment (£)							
	2023	2024	2025	2026	2027	2028	2029	2030
Feasibility, Design & Procurement	53,319.66	50,232	58,512	60,720	30,360	5,277.96	19,872	19,872
22 kW Chargers	92,000	55,200	36,800	73,600	36,800		18,400	18,400
50 kW Chargers	782,000	782,000	938,400	938,400	469,200		312,800	312,800
Mobile Chargers	14,661					87,966		
Total	941,980.66	887,432	1,033,712	1,072,720	536,360	93,243.96	351,072	351,072

Table 18 Estimated investment cost for the implementation of EVCI

Appendix B

Summary of SECAmb's GHG Emission Sources and Data Management for the Baseline Year

Scope	SECAmb GHG emission source	SECAmb Data Type	Units	SECAmb Data Source*	Responsible Team at SECAmb
Scope 1	Natural Gas Usage	Gas consumption by site from meters and invoicing from Energy Supplier	kWh	'Facility Data' Spreadsheet High data confidence	Planning and Business Development (Estates) Procurement and Strategic Estates
	Vehicle Fleet (fuel type)	Details of the Vehicle Fleet – types of vehicle sand associated engine type. Activity data from vehicles in fuel purchased (litres), collected from fleet telematic systems	Litres (fuel activity data)	'Fleet Data FY19_20 & FY2_22' spreadsheet High data confidence	Planning and Business Development (Fleet) Procurement and Strategic Estates
	Vehicle Fleet (distance travelled)	Activity data from vehicles in distance travelled ('mileage'), collected from fleet telematic systems	Miles (mileage activity data)	'Fleet Data FY19_20 & FY2_22' spreadsheet High data confidence	Planning and Business Development (Fleet) Procurement and Strategic Estates
	Refrigerants	F-gas Register, records of refrigerant top-ups for HVAC systems	kg of refrigerant	F-gas Register	Procurement and Strategic Estates

	Entonox Gas Usage	Consumption is based on Entonox canisters (700 litres) being returned with 25% remaining capacity (assumed). Only returned cannisters are calculated. Lost or in-use not captured.	Litres nitrous oxide gas converted to kg	Annual Entonox report Low data confidence	Operations and Medicines
Scope 2	Electricity use Imported heat, steam and cooling is not applicable	Consumption data from supply meters or invoicing in kWh for 75% of the estate. Consumption for the remaining 25% of the estate was estimated using the CIBSE benchmarking tool for the type of facility. This estimated kWh per m^2 of the typical building.	kWh (actual) kWh per m^2 (estimate)	'Facility Data' Spreadsheet Medium data confidence (high for 75% of estate)	Planning and Business Development (Estates) Procurement and Strategic Estates
Scope 3	Water consumption – Water Supply	Consumption from meters/invoicing in m^3 per site Provided within Water supplier and ERIC data submission	m^3	'Facility Data' Spreadsheet High data confidence	Planning and Business Development (Estates) Procurement and Strategic Estates
	Water consumption – Wastewater Treatment	Consumption from meters/invoicing in m^3 per site Provided within Water supplier and ERIC data submission	m^3	'Facility Data' Spreadsheet High data confidence	Planning and Business Development (Estates) Procurement and Strategic Estates

	FERA (Well To Tank) for Fleet fuel	Activity data from vehicles in fuel volume (litres), collected from fleet telematic systems (using data from scope 1)	Litres (fuel) Distance travelled (km)	'Facility Data' Spreadsheet and 'Fleet Data FY19_20 & FY2_22' spreadsheet High data confidence	Planning and Business Development (Fleet) Procurement and Strategic Estates
	FERA (Well To Tank) for Electricity	Electricity consumption from meters or invoicing.	kWh	'Facility Data' Spreadsheet High data confidence	Planning and Business Development (Estate) Procurement and Strategic Estates
Scope 3	Waste Generated in Operation	Waste quantities provided per site in weight (tonnes). Waste data from service provider and ERIC data submission	Tonnes of waste broken down by type of waste and management route (recycling / incineration / landfill)	'Facility Data' Spreadsheet High data confidence	Planning and Business Development - Estates
	Business travel by road – distance travelled	Travel expense data provided in mileage and vehicle fuel type data for vehicles not owned by SECAmb for use on company business.	Miles (mileage)	'RFI Ref 31 Transportation of Employees' spreadsheet High data confidence	Selenity - E Expenses provided by Human Resource Directorate

Table 19 Summary of SECAmb GHG emission sources and data management processes for carbon footprinting
**All data was requested in the RFI Scope 1-3 Info Request template.*

Appendix C

Key Assumptions and Estimations

Natural Gas Use

This refers to gas usage in buildings across our estate.

Electricity and gas usage is monitored for each site through:

1. Half-hourly metres: which generate the data to create monthly records of consumption (kWh) and cost (£); and
2. Sub-metres.

No other Scope 1 emission sources (for example diesel use for back-up generators) were identified.

Vehicle Fleet Distance Travelled

Fuel use for fleet vehicles use is monitored using fuel cards or expense claims. Data was delivered as total consumption of fuels used over the reporting period from owned/leased vehicles (litres), reported by fuel type. In order to calculate the baseline, the following assumptions were required:

- DCAs use average biofuel blend diesel;
- Contingency planning (contingency vehicles) use average biofuel blend diesel;
- Emissions associated with use of Non-operational, Specialist and HART vehicles were estimated using the DEFRA 2019 passenger vehicles emission factor for 'vans, average (up to 3.5 tonnes)' in km; and
- Unless otherwise stated, SRV and car travel was assumed to use average biofuel blend petrol.

Entonox

Entonox (Gas and Air) is a medical gas made up of 50% nitrous oxide (N_2O) and 50% oxygen. Entonox consumption was based on the number of canisters returned to the supplier, BOC. Emissions were calculated using from the volume of the canisters (700 litres of Entonox under ambient conditions, 350 litres of N_2O) and the emissions factor for N_2O. The conversion factor used to calculate these emissions was taken from the Kyoto Protocol standard for nitrous oxide, 298 $kgCO_2e/kg$.

Electricity Use

Electricity use refers to the total energy used per site from grid electricity. This is recorded through meter readings at each site; there is no current defined frequency for meter readings, so this varies from monthly reading to annual.

Electricity consumption (kWh) from meter readings/invoicing was provided for 75% of the estate (by floor area). Electricity consumption (kWh) was estimated for the remaining estate on the basis of average kWh/m^2/year reported by CIBSE for typical buildings[22].

No imported heat, steam or cooling was identified for the SECAmb estate during the baseline year.

Water Consumption

Water consumption (m^3) data was provided from water metres and invoicing per site. Scope 3 GHG emissions associated with water supply and waste water treatment are calculated separately. It is assumed that that all water used will also be treated.

Fuel and Energy Related Activities (FERA)

Transmission and Distribution (T&D) factors were included in the report of Scope 3 emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it).

Waste Generated in Operation

Waste volume was provided for all sites in tonnes and was split by waste disposal method and the type of waste. Clinical waste includes pharmaceutical waste, while paper waste is included under recycled domestic waste.

Waste type	Disposal method
Clinical waste	Incineration Alternative treatment
Domestic waste	Recycling Incineration
Confidential waste	Closed loop recycling

Table 20 Assumptions made for disposal method based on waste type

Business Travel

Business travel is reported on the basis of personal expense claims and as such excludes travel via company car (or vehicle owned by SECAmb) with fuel purchased via a fuel card.

[22] CIBSE Benchmarking Tool. Source: https://www.cibse.org/knowledge-research/knowledge-resources/knowledge-toolbox/benchmarking-registration

Appendix D

Fleet Electrification Roadmap