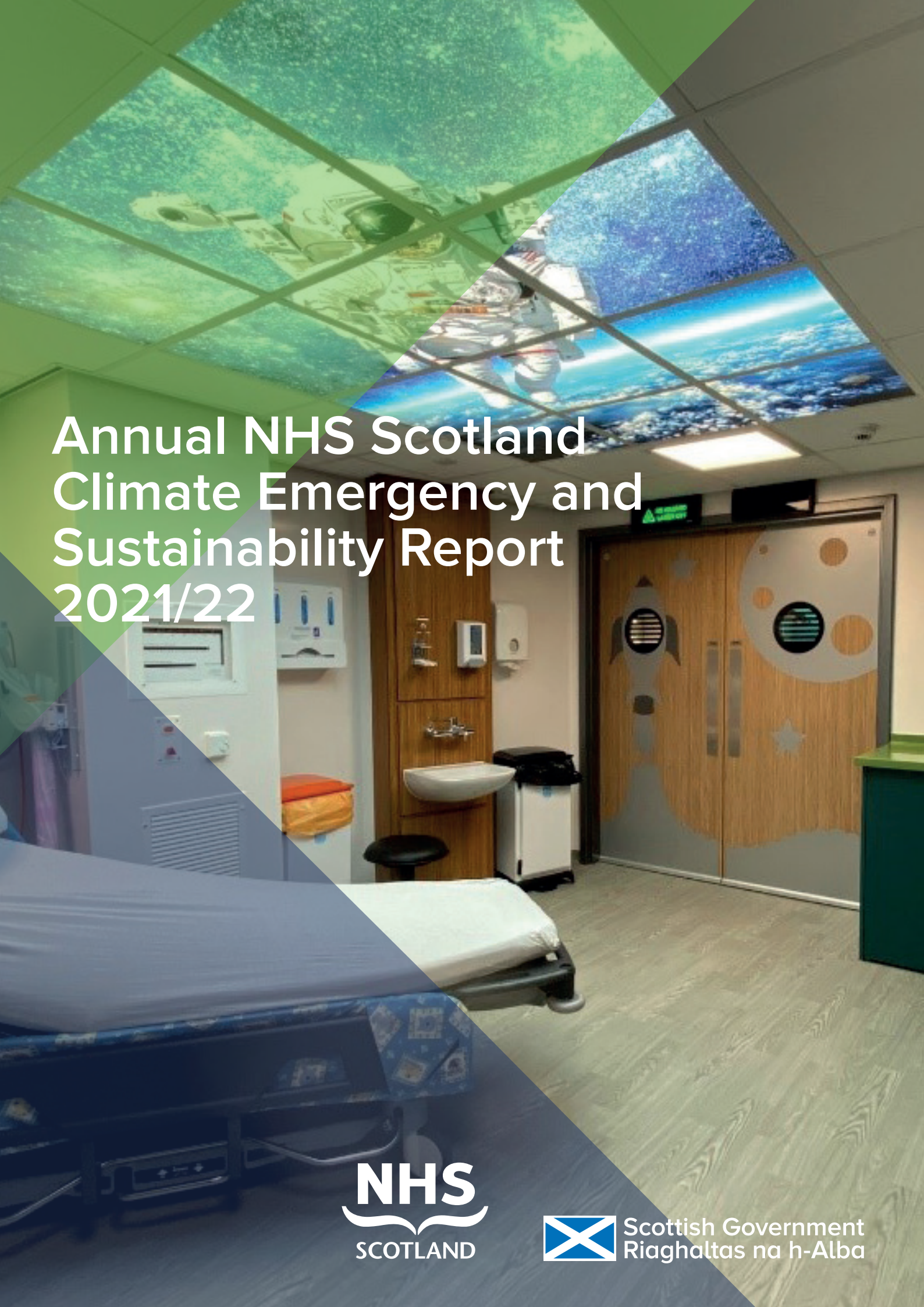


Annual NHS Scotland Climate Emergency and Sustainability Report 2021/22

NHS SCOTLAND

Scottish Government
Riaghaltas na h-Alba

1. Introduction

The planet is facing a triple crisis of climate change, biodiversity loss and pollution because of human activities breaking the planet's environmental limits. Healthcare systems contribute to the crisis through the use of resources and generation of pollution, waste and greenhouse gas emissions.

This Annual Climate Emergency and Sustainability Report for NHS Scotland 2021/22 is the first to reflect the scope and aims of the NHS Climate Emergency and Sustainability Strategy published in August 2022. Its main purpose is to provide information on:

- greenhouse gas emissions arising from the operations of NHS Scotland
- actions which have been taken or are underway to reduce NHS Scotland's greenhouse gas emissions and environmental impact
- actions to adapt to climate change.

The time-period covered is the financial year from April 2021 to March 2022. However, in some cases activity has been included that took place following March 2022, following the publication of the NHS Climate Emergency and Sustainability Strategy in August 2022.

The World Health Organisation recognises that climate change is the single biggest health threat facing humanity. Health organisations have a duty to cut their greenhouse gas emissions, the cause of climate change, and influence wider society to take the action needed to both limit and mitigate the impacts of climate change, as well as adapt to its impacts. More information on the profound and growing threat of climate change to health can be found here: www.who.int/news-room/fact-sheets/detail/climate-change-and-health

1.1 Health Board Annual Reports

This report provides an overview of progress made and is informed by national data and more detailed Annual Reports prepared by individual Health Boards. Each Health Board's Annual Climate Emergency and Sustainability Report should be available on its website.

1.2 Leadership

Making the level of progress needed with climate and sustainability action requires the support and energy of senior leaders within both Health Boards and the Scottish Government.

On 9 November 2021 at COP26 in Glasgow, the Cabinet Secretary for Health and Social Care, Humza Yousaf MSP, committed NHS Scotland to the COP26 Health Programme – to becoming a climate resilient and low carbon, sustainable health service.

The COP26 Health Programme, which was led by the UK government as the President of COP26, the World Health Organization and Health Care Without Harm,

is now known as the Alliance for Transformative Action on Climate and Health (ATACH). Over sixty countries including the United States, Spain and Germany have signed up to its aims. More information is available at: Alliance for action on climate change and health (ATACH) (who.int)

On 10 November 2021, the Scottish Government issued a new policy for NHS Scotland on the Climate Emergency and Sustainable Development (DL 2021 38). The policy sets out aims and associated targets for NHS Scotland to work towards. It brought forward NHS Scotland's target date for reaching net-zero from 2045 to 2040, in recognition of the need for the public sector and the health service to show leadership in moving more quickly to cut greenhouse gas emissions. It also outlined that each NHS Scotland body must take action to influence a reduction in those greenhouse gas emissions which are linked to its activities but are from sources which it does not own or control such as its supply chain and staff, patient and visitor travel. This is to maximise NHS Scotland's contribution to reducing Scotland and the supply chain's emissions to net-zero by 2045. The policy is available here: A policy for NHS Scotland on the climate emergency and sustainable development.

In March 2022, the NHS Scotland Climate Emergency and Sustainability Board was established to oversee the development and implementation of NHS Scotland's strategy. It is chaired by the Chief Medical Officer for Scotland and NHS Scotland's Chief Operating Officer, and currently meets every two months.

In August 2022, the NHS Scotland Climate Emergency and Sustainability Strategy was published setting out actions to be taken to help achieve NHS Scotland's climate and sustainability aims and targets. The strategy is available here: NHS Scotland climate emergency and sustainability strategy: 2022-2026 - gov.scot (www.gov.scot)

In December 2022, NHS Scotland became a member of Healthcare Without Harm's Global Green Hospitals network; an international community of hospitals, healthcare facilities, health systems, and health organisations working to achieve measurable outcomes improving sustainability at their facilities while promoting environmental health in their communities. Healthcare Without Harm's website can be found here: Health Care Without Harm (noharm-europe.org)

The Cabinet Secretary for Health and Social Care, Humza Yousaf, launched the NHS Scotland Climate Emergency and Sustainability Strategy 2022 to 2026 during a visit to the Balfour Hospital in Orkney. Scottish Government Ministers have continued to provide leadership to the work throughout this reporting year, carrying out a number of engagements since August 2022, including:

During Scottish Climate Change Week (26 September – 2 October 2022), the Cabinet Secretary for Health and Social Care visited Douglas Medical Practice in Dundee to hear about work to improve patient outcomes and support the use of more environmentally friendly inhalers for asthma and Chronic Obstructive Pulmonary Disease (COPD).

The Minister for Public Health, Women's Health and Sport also visited Raigmore Hospital during Climate Week to highlight work undertaken to improve operating theatres as part of Raigmore Hospital's Green Theatres Project.

To achieve the ambitions in the strategy, including net-zero emissions by 2040, it is necessary to exchange knowledge with both domestic and international partners. This is to help us learn from the work of other countries, to share best practice in areas where Scotland is leading and to work together on common challenges. Working links have been established with colleagues across the UK and we are working with partners internationally.

1.3 Greenhouse gas emissions

NHS Scotland aims to become a net-zero organisation by 2040 for the following sources of greenhouse gas emissions:

- building energy use
- owned and leased fleet fuel use
- fluorinated gases and anaesthetic gases
- purchased energy use (electricity, heat, steam)
- energy transmission and distribution
- waste
- water consumption
- waste water treatment
- business travel, including the use of grey fleet

NHS Scotland also aims to maximise its contribution to Scotland and its supply chain achieving net-zero emissions by 2045. This covers the following sources which the NHS does not control but which it can influence:

- supply chain
- staff commuting
- patient and visitor travel

In 2021/22, three Health Boards piloted the development of Net-Zero route maps – NHS Ayrshire and Arran, NHS National Education for Scotland and NHS Shetland. This approach, funded by the Scottish Government, was rolled out to the remaining nineteen Health Boards in 2022/23. These reports are being analysed and further information on them will be provided in the annual report for 2022/23.

Table 1 below sets out greenhouse gas emissions within the 2040 target by source produced between financial years 2019/20 and 2021/22 by the Health Boards that make up NHS Scotland. This data is compiled from different sources including – the National Energy Management System, Public Health Scotland prescribing data, medical gas supplier data and each Health Board's Annual Report.

Table 1 also shows an estimate of how much carbon is naturally captured by the outdoor estate at two Health Boards, by soil and plants growing on it.

More detail on the emissions source in table 1 are provided in subsequent sections of the report. There is still work to be done to improve our understanding of NHS Scotland's carbon footprint and work will continue to promote best practice throughout NHS Scotland to ensure reductions are made as quickly as possible. In terms of the current data being reported, confidence levels are high in the accuracies of the emissions relating to buildings, inhalers and medical gases. However, further work is needed to gain a more accurate understanding of other sources of emissions, particularly significant areas such as supply chain emissions, travel and waste.

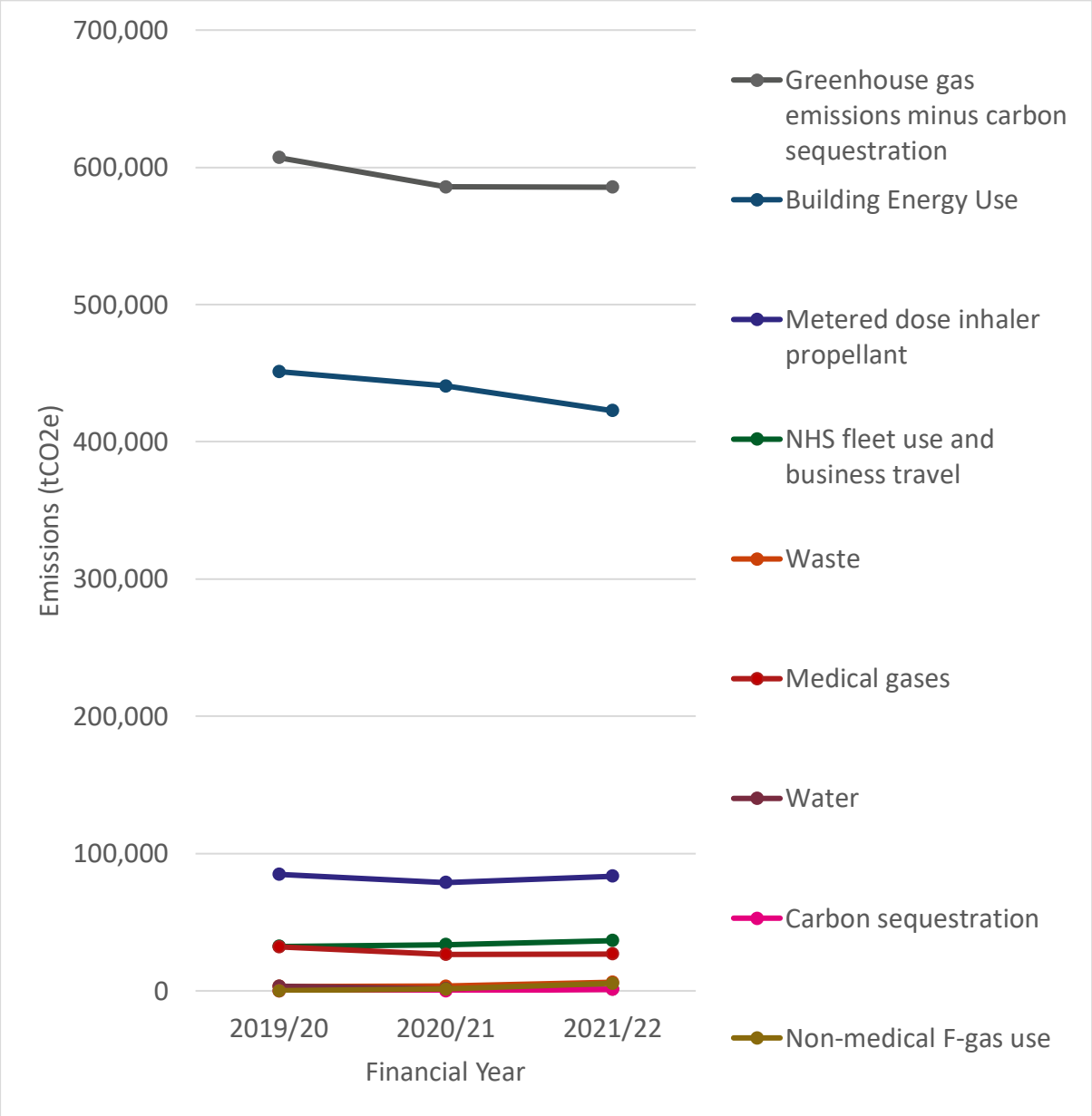
NHS Scotland is therefore working to improve the comprehensiveness and accuracy of its greenhouse gas emission reporting. In future years, we intend to add more categories of emissions to this report such as staff, patient and visitor commuting as

calculations methods are agreed and implemented. In addition, future years may show apparent increases in some categories of emissions which are in fact due to better reporting rather than actual increases, as well as indirect increases in emissions due to increased renewable infrastructure and construction on site. In this report, examples include non-medical F gas increases due to improved data capture and reporting. Additionally, the figure for carbon sequestration in the table relates to only two territorial Health Boards – comparable figures have not yet been calculated for other Health Boards, but it is anticipated that they will be included in future years.

Table 1 - NHS Scotland 2040 Net-Zero Target Emissions 2019/20 to 2021/22					
	Amount of greenhouse gas (tonnes of CO2 equivalent) **(n) = number of HBs reporting**			**Percentage change since 2019/20**	**Data Source**
Emissions Source	**2019/20**	**2020/21**	**2021/22**		
Building Energy Use	451,161	440,710	422,687	- 6%	NHS NSS – National Energy Management System
Non-medical F-gas use	140 (6)	1,270 (6)	5,487 (9)	Increase 3,819%	Health Board Climate Emergency and Sustainability Reports – 2021/22
Medical gases	32,047	26,511	26,832	- 16%	Scottish Government
Metered dose inhaler propellant	84,844	78,860	83,513	- 2%	Scottish Government
NHS fleet use and business travel	32,307	33,632	36,556	Increase 13%	Health Board Climate Emergency and Sustainability Reports – 2021/22
Waste	3,115 (14)	3,333 (15)	6,271 (16)	Increase 101%	Health Board Climate Emergency and Sustainability Reports – 2021/22
Water	3,397 (16)	1,505 (14)	1,142 (15)	- 66%	Health Board Climate Emergency and Sustainability Reports – 2021/22
Carbon sequestration	0 (0)	0 (0)	1,027 (2)	-	Health Board Climate

					Emergency and Sustainability Reports – 2021/22
Greenhouse gas emissions minus estimated carbon sequestration	607,010	585,822	585,515	- 4%	

Figure 1: NHS Scotland 2040 Net-Zero Target Emissions 2019/20 to 2021/22
(Sources as per Table 1)



1.4 National Sustainability Assessment

NHS Scotland has developed a National Sustainability Assessment Tool (NSAT), which all Health Boards have initially used on an annual basis and will move to a biennial basis from 2024/25. This benchmarks their progress across sixteen different areas of sustainability and demonstrate how local actions are contributing to achieving the United Nations Sustainable Development Goals.

The NSAT replaced the Good Corporate Citizenship Assessment Model (GCCAM) which was widely used by NHS providers and commissioners in England and NHS Health Boards in Scotland from 2008. All assessments for 2021/22 have been reviewed by NHS Assure and an external auditor to ensure consistent, evidence-based scoring. Due to the pressures of the Covid-19 pandemic, reviews of 2020/21 assessments were only carried out on request.

The average 2021/22 score for Health Boards that chose to have their assessments reviewed by NHS Assure in 2020/21 has increased from 49% to 53%. The average score for Health Boards who did not have their self-assessed scores reviewed in 2020/21 has decreased from 53% to 38%. The overall average 2021/22 score has decreased from 49% to 44%.

For 2022/23, the NSAT has been updated to reflect the NHS Scotland Climate Emergency and Sustainability Strategy and other changes to policy, targets, and legislation.

The NSAT scores for 2021/22 can be found in the **Annex.**

2. Climate Change Adaptation

While efforts to reduce the rate and scale of climate change continue, we must also adapt to the new conditions we are facing. Indeed, there will continue to be climactic effects even if net-zero targets are reached, due to the delay between reducing emissions and their effect on the atmosphere.

The changing climate is increasing risks for health, healthcare assets and health services. More information on these risks in the UK can be found in the UK Climate Change Committee's Health and Social Care Briefing available here: www.ukclimaterisk.org/independent-assessment-ccra3/briefings/

In June 2019, NHS Chief Executives committed to each Health Board undertaking a Climate Change Risk Assessment covering all operational areas and producing a Climate Change Adaptation Plan to ensure climate-resilient health systems under changing climate conditions [NHS Chief Executives minutes: June 2019 - gov.scot (www.gov.scot)]

Fifteen Health Boards have completed a Climate Change Risk Assessment. Building on this, these Health Boards are developing Adaptation Plans. Due to the important role the NHS plays in local communities, this work will contribute to public sector-wide local and regional adaptation planning activity. Further details on progress will be included in future annual reports.

3. Building Energy

The NHS uses electricity to power its buildings, equipment and (increasingly) its vehicles. It also needs to heat its buildings. Greenhouse gases are emitted through the burning of fossil fuels for heat at NHS sites and also in the generation of electricity supplied through the national grid.

Reducing emissions in building energy use is part of the NHS's 2040 net-zero target. The NHS also has a target of using renewable heat for all the buildings it owns by 2038.

Figure 2 below shows how NHS Scotland's emissions from building fossil fuel use, district heat networks and biomass, and electricity have changed over the last seven years. **Figure 3** shows the overall trend of emissions. These figures include emissions released from burning the fuels and by the processes of extracting and suppling the fuels to the NHS ("well to tank emissions"). A table of these figures is included in the **Annex.**

Figure 2:
Source: NHS National Services Scotland - National Energy Management System

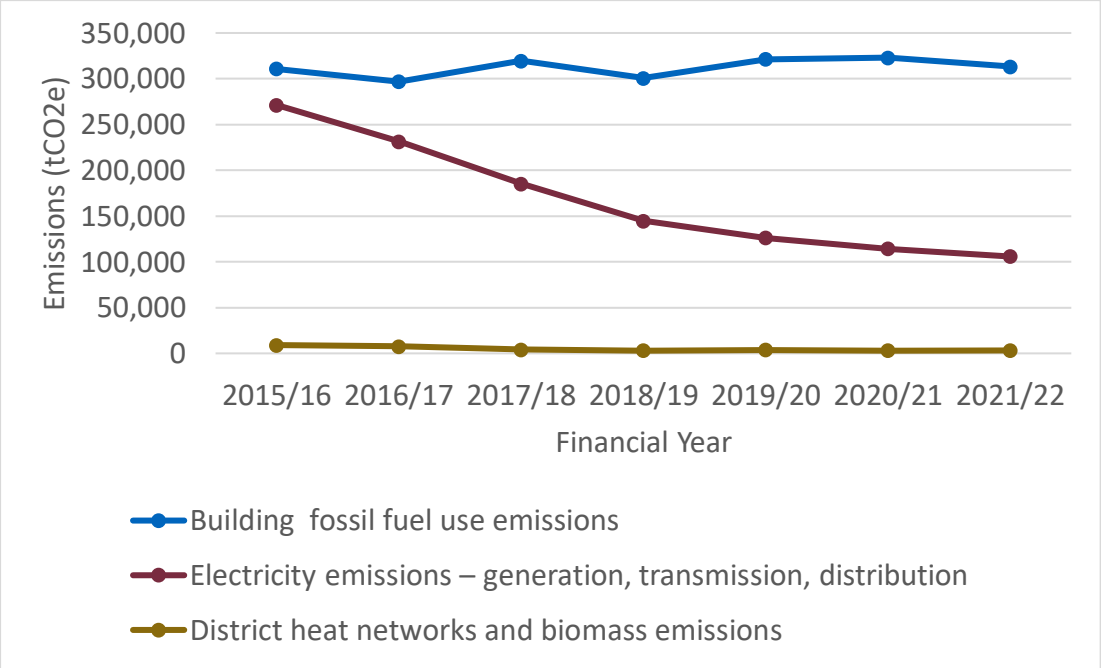
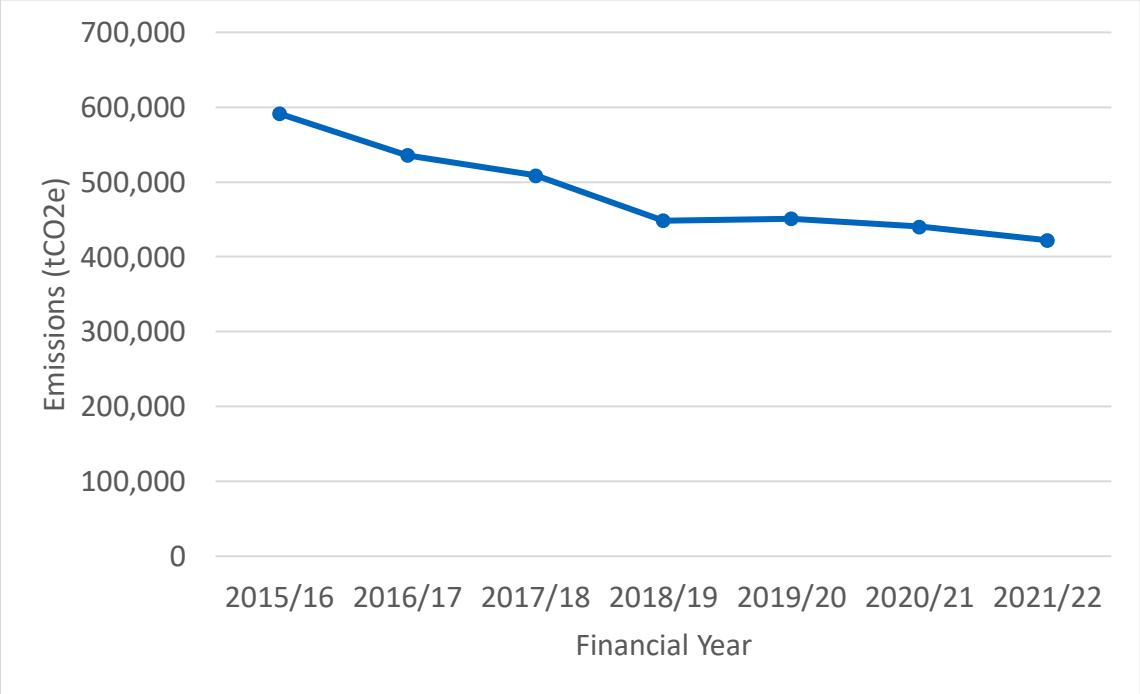


Figure 3:
Source: NHS National Services Scotland - National Energy Management System



3.1 Building fossil fuel emissions

Building fossil fuel emissions have not decreased over the last seven years – they were 311,000 tCO2e in 2015/16 and 313,000 tCO2e in 2021/22. This can be attributed to a focus on decreasing electricity consumption but it underlines that a change in approach is needed. A consistent decrease in building fossil fuel emissions is needed to meet the 2038 renewable heat target and the overall 2040 net-zero target.

3.2 District heat networks and biomass

There has been a decrease in emissions from district heat networks and biomass. In general, zero emissions heat networks are likely to be a preferred heating option for a number of NHS sites. Health facilities can provide a baseload of heat demand, increasing the economic viability of heat networks and contributing to heat decarbonisation beyond the boundaries of the NHS. However, at this stage the decrease in emissions from district heat networks and biomass emissions can be considered neutral – no positive or negative conclusions can be drawn from it.

3.3 Electricity

Emissions from NHS Scotland's use of electricity decreased by 61% between 2015/16 and 2021/22 because the electricity supplied through the national grid in the UK has become a lot less carbon intensive over the last seven years and the NHS has reduced its electricity usage.

Over the last seven years, the use of coal to generate electricity has significantly reduced. 360 g of CO2 equivalent was produced for every kWh of electricity in 2015. That fell to 149 g of CO2 equivalent for every kWh in 2021. The amount of CO2 equivalent produced in generating electricity is forecast to fall even further (to 18 g per kWh in 2038 and 2 g per kWh by 2050[i]) as electricity is increasingly produced by renewable power.

The NHS has also reduced its electricity consumption over the last seven years from 546,159 MWh in 2015/16 to 457,877 MWh in 2021/22, a decrease of 16%. Reducing electricity consumption is essential not only for reducing emissions in the short-term, but also to allow for more electricity to be used for electric vehicles and for producing heat.

Information on building energy emissions at Health Board level is set out in the Annex to this report.

3.4 Actions taken

As of February 2023, the Scottish Government's Central Government Energy Efficiency Grant Scheme is supporting six Health Boards with capital funding of £11.8 million to deliver projects and six Health Boards with £285,000 of revenue funding to prepare a programme of decarbonisation and energy efficiency projects. Funding had been awarded to ten Health Boards in total. This scheme is an open fund meaning that Health Boards can continue to submit applications to it for funding. The following Health Boards had funding agreed as of February 2023

Table 3: Summary of funding allocated to Health Boards from Central Government Energy Efficiency Grant Scheme Source: Scottish Government

Organisation	Funding type	Project value	Completion year
1. Ayrshire and Arran	Capital	£873,000	22/23
	Pre-capital	£47,000	22/23
2. Borders	Pre-capital	£50,000	22/23
3. Fife	Pre-capital	£48,000	22/23
4. Forth Valley	Capital	£1,962,000	23/24
5. Grampian	Pre-capital	£50,000	22/23
6. Greater Glasgow and Clyde	Capital	£1,312,000	23/24
	Capital	£498,000	22/23
	Capital	£432,000	22/23
7. Lanarkshire	Pre-capital	£50,000	22/23
8. Lothian	Capital	£2,000,000	22/23
9. Orkney	Capital	£3,987,000	24/25
10. Tayside	Capital	£761,000.00	23/24
	Pre-capital	£40,000	22/23
Total	**Pre-capital**	**£285,000**	**22/23**
	Capital	**£11,800,000**	**22/23**

4. Sustainable Care

Staff must be at the heart of work to achieve a culture of stewardship within NHS Scotland, where resources are safeguarded and responsibly used to provide environmentally sustainable healthcare. Improving patient care is fundamental and all steps taken are with the dual focus of improving outcomes for patients and reducing environmental impact. There are three national priority areas for making care more sustainable; surgery (through the National Green Theatre Programme), anaesthesia and respiratory medicine.

4.1 Medical gases

The gases that are used for anaesthetics and pain relief are potent greenhouse gases. These are nitrous oxide (laughing gas), Entonox (which contains nitrous oxide) and the "volatile gases" - desflurane, sevoflurane and isoflurane. For example; desflurane, isoflurane and sevoflurane have global warming potentials that are respectively 2540, 510 and 130 times more potent than carbon dioxide.

Throughout 2021/22, efforts to reduce these emissions continued to be made through various anaesthetic environmental networks, including Green Anaesthesia Scotland. The Centre for Sustainable Delivery, which is part of NHS Golden Jubilee, has set up the National Green Theatre Programme (NGTP), which is now supporting Health Boards with lowering emissions from anaesthetic gases.

Key Achievement - Scotland to remove highly polluting anaesthetic gas.

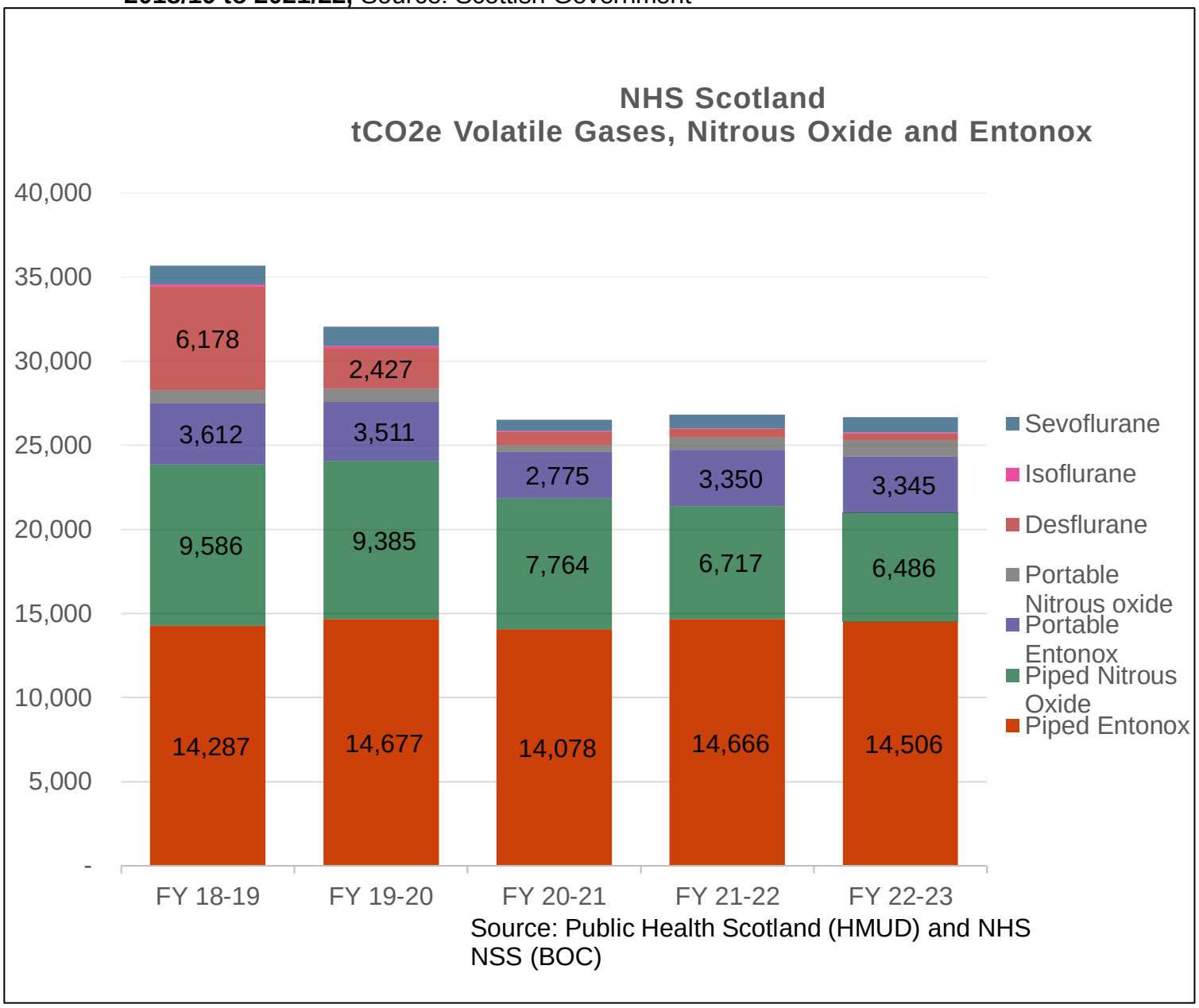
Desflurane, was responsible for most of the emissions from NHS Scotland's use of volatile medical gases (desflurane, sevoflurane and isoflurane).

Green Anaesthesia Scotland, a grassroots group of anaesthetists, started to decrease the use of this drug in 2017, substituting it with another agent, sevoflurane, which is just as safe and effective, reduces carbon emissions by more than 80%, and costs four times less.

This work continued with the establishment of the National Green Theatre Programme and, after consultation with the wider anaesthetic community, it was agreed that desflurane will no longer be available on the National Procurement contract.

Figure 4 below outlines the emissions from the medical gases used in NHS Scotland from 2018/19 to 2021/22. Further data is set out in the Annex.

Figure 4: Emissions from the medical gases used in NHS Scotland from 2018/19 to 2021/22, Source: Scottish Government

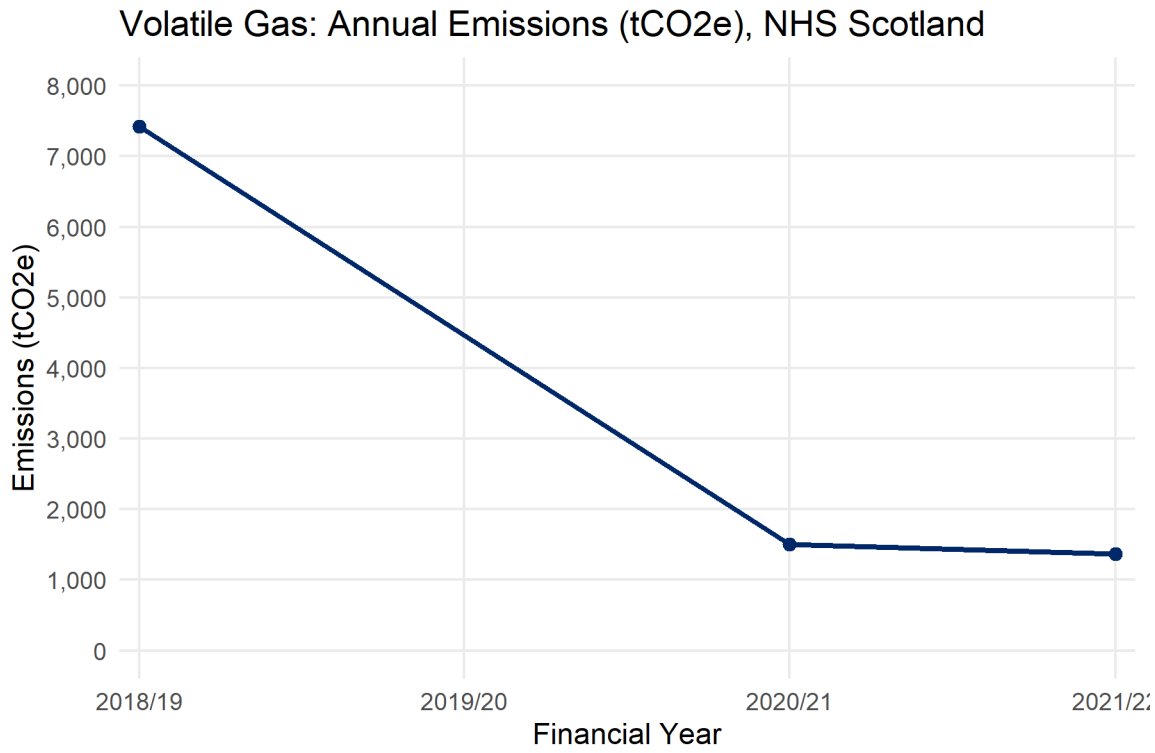


Source: Public Health Scotland (HMUD) and NHS NSS (BOC)

An 82% reduction in volatile gas emissions was achieved over the period 2018/19 to 2021/22 by:

- anaesthetists switching from desflurane in preference for sevoflurane, which has a lower environmental impact.
- using low flow anaesthetic techniques coupled with closed circuit anaesthetic machines, with end tidal control continued to reduce the total volatile consumed through system efficiencies.
- initiating a gas anaesthetic within theatre, as opposed to the anaesthetic room to encourage efficiencies.

Figure 5: Source Scottish Government



There has been a very large decrease in the use of desflurane across NHS Scotland. **In February 2023,** NHS Scotland National Procurement removed desflurane from the national contract. This was following a consultation period with Health Boards. This means that whilst Health Boards will still be able to purchase desflurane themselves, neither desflurane nor the necessary supporting infrastructure, will be available to buy on a national basis.

Figure 6: Source Scottish Government

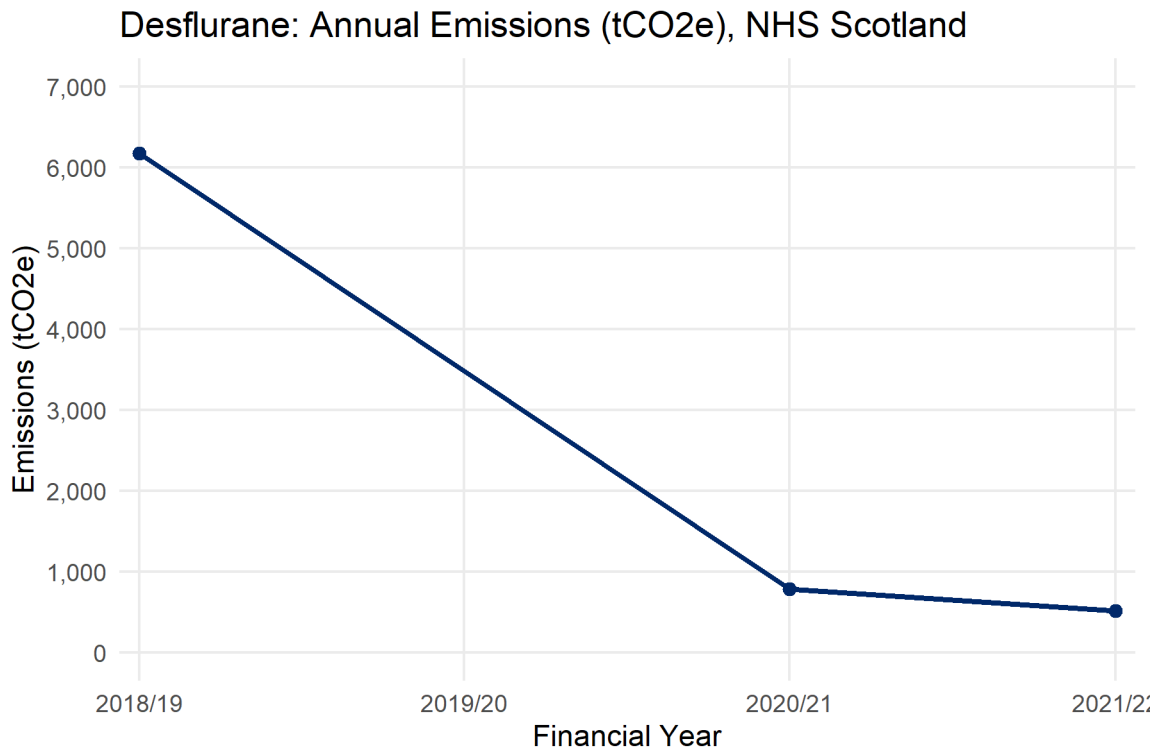
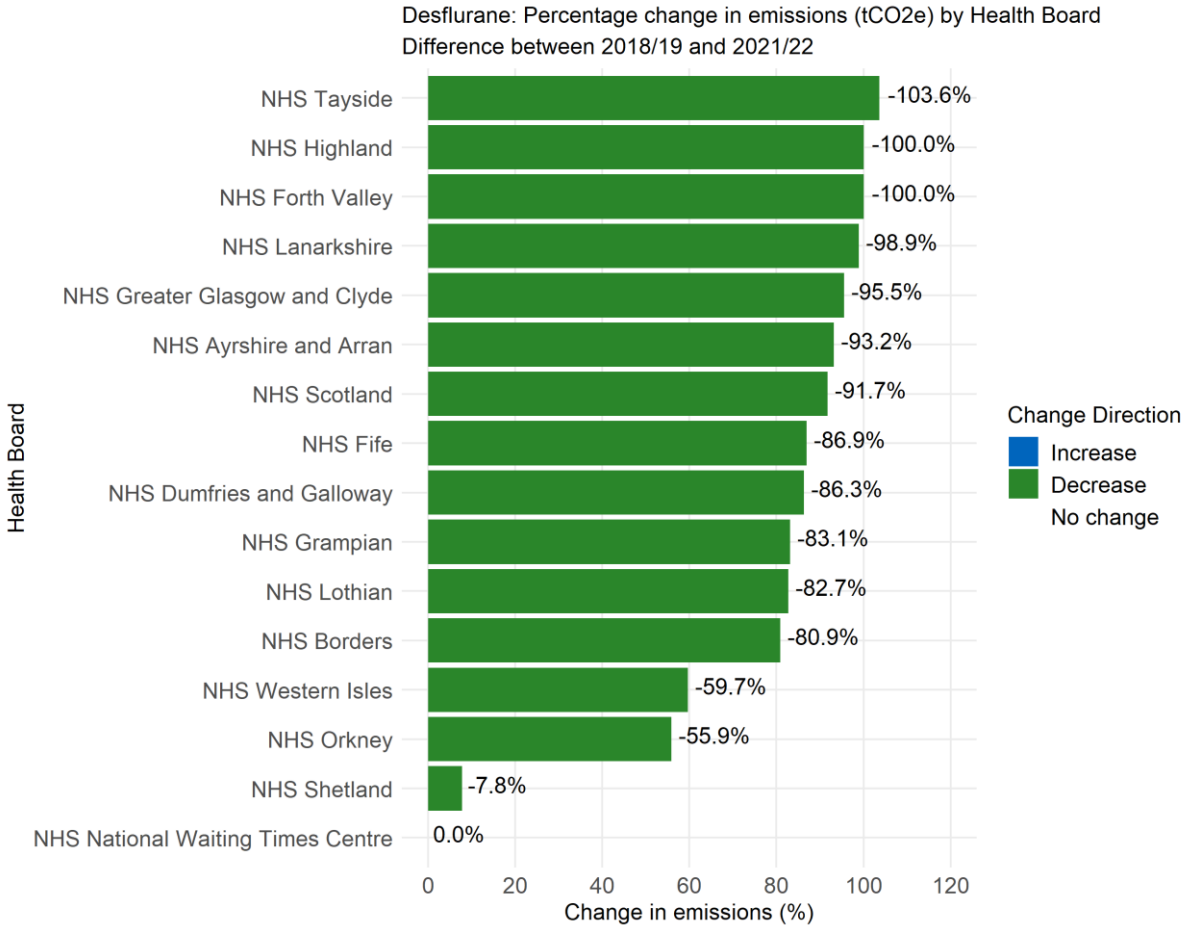


Figure 7: Source Scottish Government



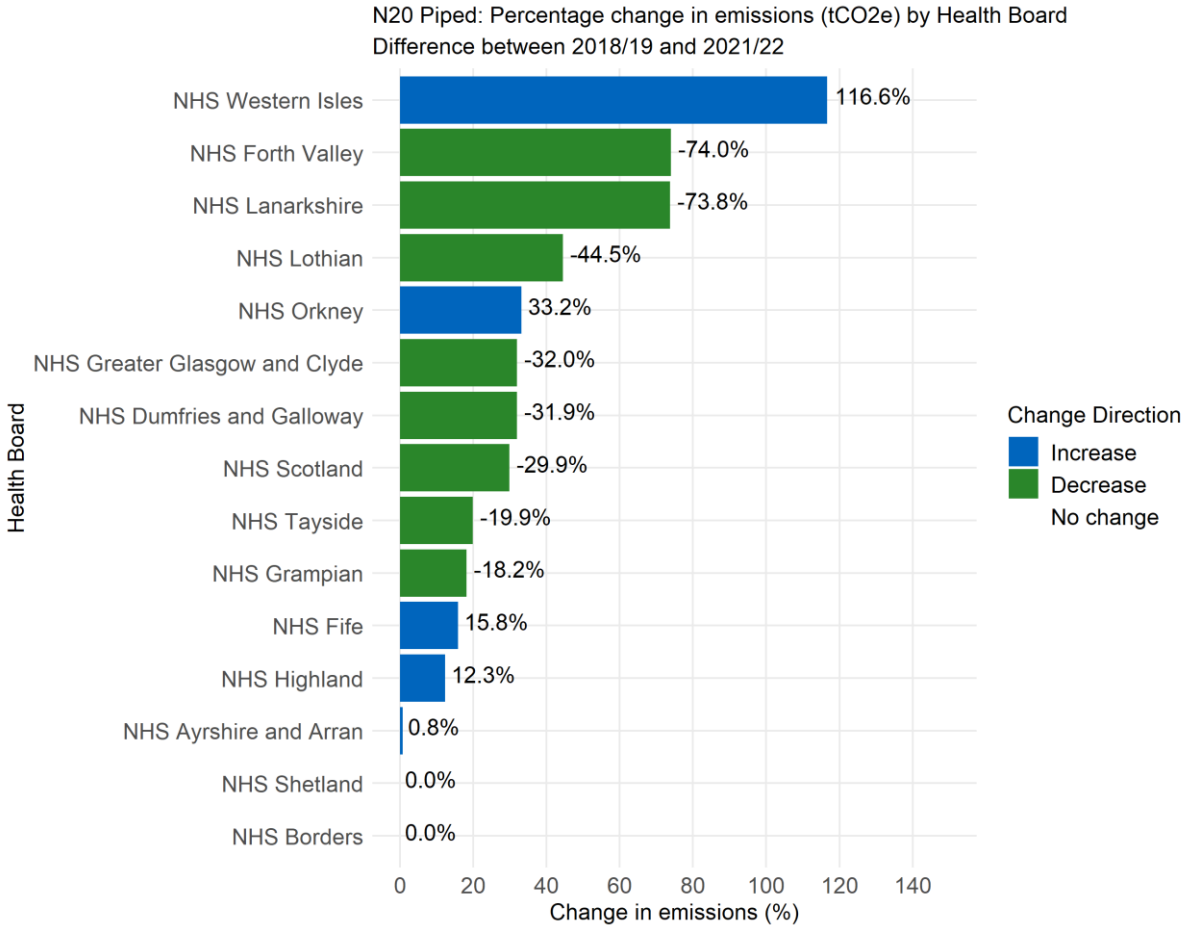
4.2 Nitrous Oxide

Nitrous oxide is used in general anaesthesia and for pain relief (in combination with oxygen, under the brand name Entonox, commonly known as “gas and air”). It is an important source of pain relief, and is particularly important for maternal health when a woman is in labour.

Nitrous oxide emissions are largely caused by leaks in piped medical gas systems. It is also used much less in modern anaesthetic practice than in the past and many piped systems are redundant.

There have been encouraging reductions in emissions from piped nitrous oxide over the period 2018/19 to 2021/22. However, there are variations in trends at Health Board level:

Figure 8: Source Scottish Government



A national programme of work was established in 2021/22 with the aim of supporting further reduction in nitrous oxide emissions. The following documents have been issued to support Health Boards in reducing their emissions of nitrous oxide:

- Interim protocol for decommissioning of nitrous oxide manifolds (scot.nhs.uk)
- Nitrous Oxide mitigation implementation plan (scot.nhs.uk)
- Technical update: Anaesthetic nitrous oxide system loss mitigation and management (scot.nhs.uk)

Unlike nitrous oxide for general anaesthesia, Entonox continues to be commonly used for pain relief. NHS Scotland aims to ensure that Entonox is available for pain relief while also minimising the gas which escapes to the atmosphere.

4.3 Respiratory medicine

Greenhouse gases are used as a propellant in metered dose inhalers prescribed for the treatment of asthma and COPD. Most of the emissions from inhalers are from the use of reliever inhalers – Short Acting Beta Agonists (SABAs). By helping people to manage their condition more effectively, we can improve patient care and reduce emissions. There are also more environmentally friendly inhalers such as dry powder inhalers which can be used where clinically appropriate. **Table 4** below sets out the

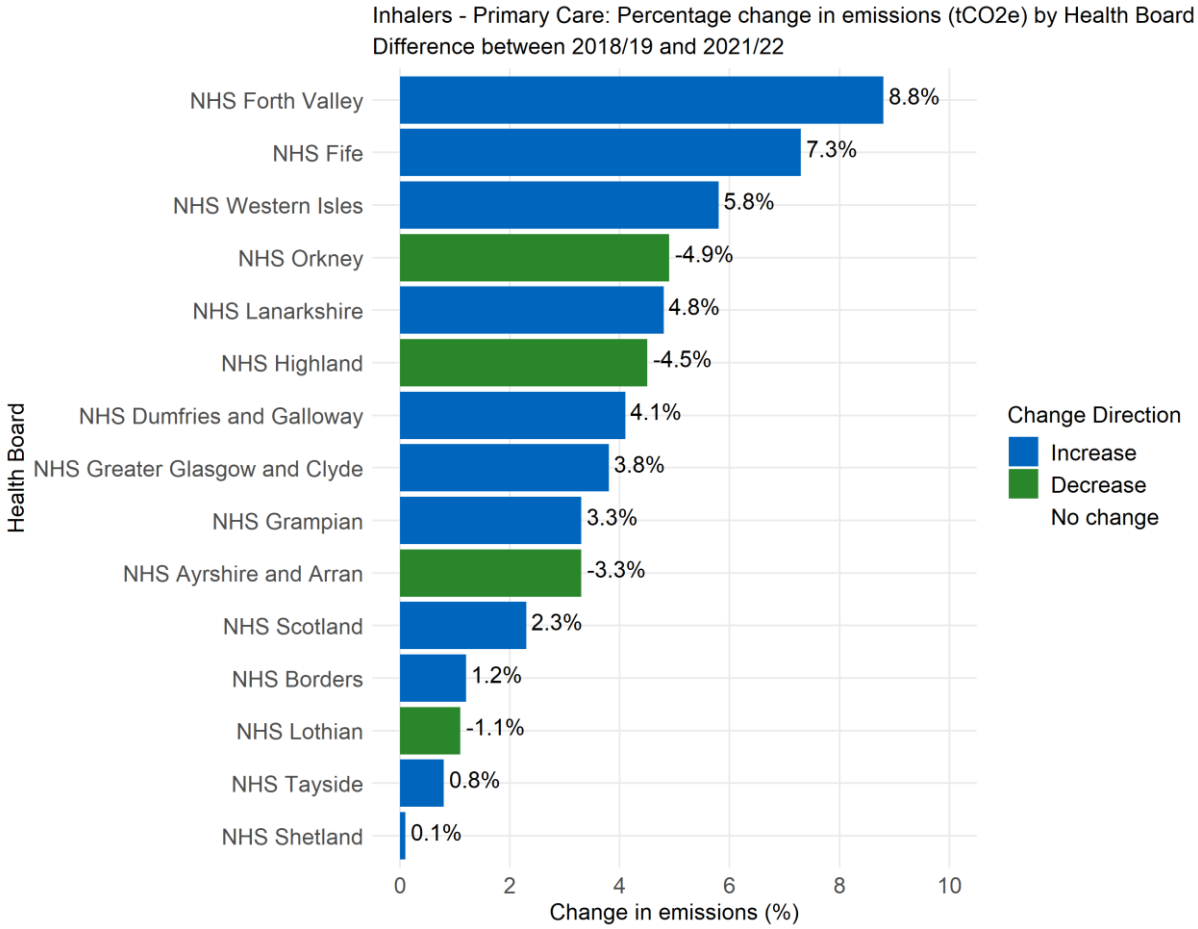
emissions from this source in NHS Scotland over the last four years. Further data is set out in the Annex . Emissions from inhalers dispensed in secondary care are only included from 2021/22 onwards.

Table 4 - Emissions from metered dose inhaler propellant
Source: Scottish Government

Indicator	**Emissions (tCO2e)**			
	2018/19	**2019/20**	**2020/21**	**2021/22**
Primary care - inhaler propellant emissions	79,535	84,844	78,860	81,351
Secondary care - inhaler propellant emissions				2,162
Total - inhaler propellant emissions	79,535	84,844	78,860	**83,513**

Emissions from this source have remained constant at a national level over the last four years. This has not been a priority area for action by NHS Scotland until recently and so no decrease in emissions was anticipated. However, there is variation in the emissions at individual Health Board level although it is not known whether they are significant or due to normal variation in prescribing over time (see Figure 9 below). Further information is provided in the Annex.

Figure 9: Source Scottish Government



The National Respiratory Quality Prescribing Guidance was revised during 2022, written by the Scottish Government and NHS Scotland, supported by patients, patient organisations and a multidisciplinary team across primary and secondary care. This builds on the previous 2018 – 21 Strategy and continues to promote good person-centred care and incorporates environmental considerations of prescribing for respiratory conditions.

The guidance will be published in Summer 2023 for a full public consultation, aiming for final publication in the Autumn. Specific recommendations to encourage consideration of the environmental impacts when prescribing in respiratory medicine are included, for example, ensuring that local formularies contain information for prescribers on inhalers with a lower global warming potential. Experts by Experience (people with personal experience of suffering from respiratory conditions or caring for someone who has) formed part of the guidance development group, and were given the opportunity to raise any concerns with the guidance which were addressed. The guidance is person-centred, aiming for optimising respiratory care with an emphasis on prescribing the right inhalers for the individual to get better outcomes for them, minimising over-use of reliever inhalers and supporting individuals to use propellant-free options where clinically appropriate. There has also been engagement with stakeholders, for example, Asthma and Lung UK, Chest, Heart and Stoke Scotland, the Scottish Respiratory Advisory Committee, the Scottish Respiratory Pharmacy Special Interest Group and NHS Education for Scotland (Pharmacy and Nursing).

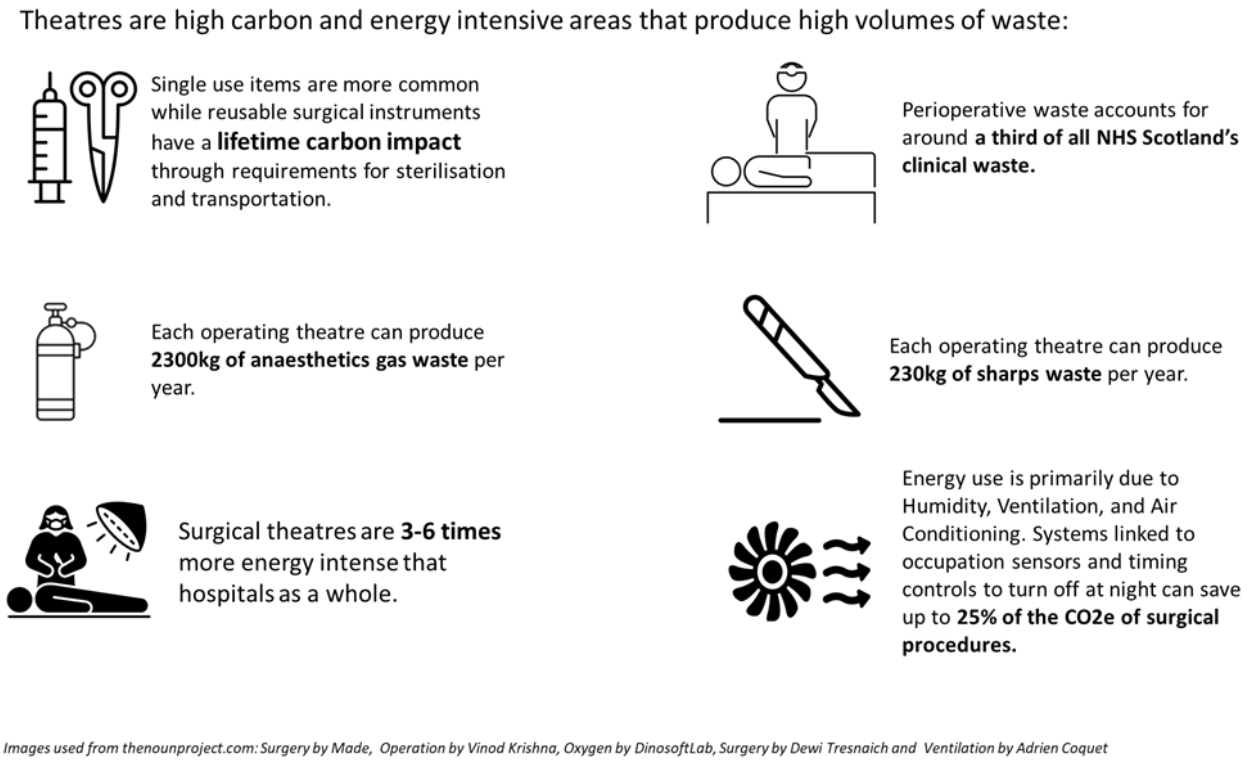
4.4 National Green Theatre's Programme

The Centre for Sustainable Delivery, which is part of NHS Golden Jubilee, has been commissioned to deliver the National Green Theatres Programme (NGTP). The Programme aims to reduce the carbon footprint of theatres across NHS Scotland and enable more environmentally sustainable care, by:

- using the learning from the pilot work done by NHS Highland: assessing and packaging these into bundles of high impact actions.
- coordinating the implementation of these bundles of action across NHS Scotland.
- exploring other potential high impact actions and innovations.
- sharing learning on the wider applicability of these actions to other care settings.

Focusing on reducing the environmental impact of theatres provides a great opportunity to make a positive difference in moving towards net zero targets.

Image 1: Overview of waste produced during theatre



Images used from thenounproject.com: Surgery by Made, Operation by Vinod Krishna, Oxygen by DinosoftLab, Surgery by Dewi Tresnaich and Ventilation by Adrien Coquet

The NGTP is founded on the learning from NHS Highland's Green Theatre Project (GTP). This project was a series of local initiatives which reduced greenhouse gas emissions, resource use and waste associated with surgery. The key actions are outlined below in Image 2.

Image 2: Key actions planned of the National Green Theatre Programme

To ensure clinical leadership is at the core of this work, the NGTP has established the National Green Theatres Specialty Delivery Group (SDG). This group comprises clinical and professional representatives from Health Boards across Scotland, who are able to support the development and implementation of this programme. Their advice, assurance and leadership are key in enabling the success and fully realising the ambition of this work. The NGTP also works closely with colleagues across other organisations including NHS National Services Scotland, Scottish Government, academia and industry. It was launched to NHS Scotland on the 28 March 2023 with a public launch in May 2023.

Dealing with liquid clinical waste

During normal theatre operation a significant quantity of liquid clinical waste (mainly body fluids) is created. Management of this waste has significant financial and environmental costs. The waste is collected in suction receptacles with the addition of a gelling agent to ensure it can be safely transported and is compliant. In some cases, receptacles are placed in additional plastic packaging. Depending on the Board arrangement and waste classification, the waste is treated or sent on for High Temperature Incineration.

The current system uses various single use consumables with high financial and environment cost. The waste is often heavy, which can cause issues in terms of moving and handling that can impact the health and safety of staff.

The NGTP has been reviewing options to improve the management of this waste stream. The review includes systems which allow waste to be collected, filtered and discharged through the sewage system. A discharge system was first piloted at NHS Highland, has since been adopted by a number of Health Boards and is considered to be a viable alternative to single use disposable suction receptacles, offering sustainability, health and safety benefits. The NGTP is currently developing a business case which will support Boards in adopting such systems.

4.5 Realistic Medicine

Delivering Value Based Health & Care: A Vision for Scotland was published on 14 December 2022. It sets out some of the challenges our health and care system is facing and how practising Realistic Medicine can help deliver a more sustainable system. This vision is closely aligned with the NHS Scotland Climate Emergency and Sustainability Strategy; one of its three strategic aims is sustainability and stewardship, which aims for more sustainable and appropriate resource utilisation. The vision sets out that a culture of stewardship must be established in Scotland, where resources are safeguarded and used responsibly to provide environmentally sustainable healthcare. A central theme of Realistic Medicine has been to engage health and care professionals to become the stewards of healthcare resources, given that it is their decisions that commit our precious healthcare resources.

5. Travel and Transport

5.1 Decarbonising our fleet

Road transport accounts for over 20% of greenhouse gas emissions in the UK and causes poor air quality and noise pollution. The Scottish Government aims to transform Scotland's transport system from one based on fossil fuels to one reliant on renewable energy and active travel.

NHS Scotland aims to:

- reduce its greenhouse gas emissions from its fleet vehicles and business travel as part of achieving net-zero
- maximise its contribution to reducing emissions from staff commuting and patient and visitor travel to net-zero by 2045
- contribute to a 20% reduction by 2030 from 2019 levels in the total distance travelled by car in Scotland.

Fleet vehicles are vehicles owned or leased and operated by Health Boards.

Business travel refers to travel by staff for work purposes (not including commuting).

NHS Scotland's total reported emissions from its fleet and business travel are set out in **Table 5** below. Data is not available from all Health Boards for these categories or for all of the last three years. Further, more detailed data is set out in the Annex.

TABLE 5 – NHS Scotland Reported Fleet and Business Travel Emissions 2019/20 to 2021/22 greenhouse gas emissions
Source – Health Board Annual Climate Emergency and Sustainability Reports 2021/22

	Amount of greenhouse gas (tonnes of CO2 equivalent) **(n) = number of HBs to provide figure**			**Percentage change since 2019/20**
	2019/20	2020/21	2021/22	
Fleet	26,507 (12)	30,782 (14)	29,548 (14)	Increase 11%
Business travel	5,812 (9)	2,850 (9)	7,008 (12)	Increase 20%
Total	32,319	33,632	36,556	Increase 13%

The increase in reported total emissions is due to better reporting rather than to underlying changes in actual travel emissions. It is anticipated that all Health Boards will report their emissions for fleet business travel for 2022/23 to allow a better understanding of the effectiveness of actions to reduce these emissions.

Decarbonising the vehicle fleet is a priority for NHS Scotland to help reduce greenhouse gas emissions as much as possible. NHS Scotland is aiming to:

- remove fossil fuel cars and light commercial vehicles from its fleet by 2025
- remove all fossil fuel vehicles from the fleet by 2032 or earlier where possible.

A summary of fleet composition by Health Board as of 31 October 2022 is provided in the Annex.

A number of Health Boards have already made excellent progress in replacing petrol and diesel cars and light commercial vehicles. Over 50% of NHS Tayside's fleet cars are already electric, 100% of NHS Orkney vans are electric and NHS Lothian has 160 electric vehicles. However, there are variations in progress by Health Boards.

Overall, for the 23 out of 24 Health Boards which provided data for 31 October 2022:

- 19% of NHS cars are electric
- 16% of NHS light commercial vehicles are electric
- 1% of heavy vehicles do not use fossil fuels

5.2 Electric Vehicle Charging

To support the transformation of our fleet, and as outlined in our strategy, last year Health Boards continued to expand their infrastructure for electric vehicle charging for corporate fleet, patients, staff and visitor use.

As of April 2021, there were 397 electric vehicle charge points at 123 sites across 15 Health Boards.

As of April 2022, the number of charge points had increased to 538 at 197 sites across 15 Health Boards.

The 15 Health Boards are:

- Ayrshire and Arran
- Borders
- Dumfries and Galloway
- Fife
- Forth Valley
- Golden Jubilee
- Grampian
- Greater Glasgow and Clyde
- Highland
- Lothian
- National Services Scotland
- Orkney
- Shetland
- State Hospital
- Tayside

5.3 Enabling Active Travel

Walking, wheeling and cycling are the healthiest ways to travel, with the lowest environmental impact. The NHS is committed to providing viable sustainable travel options and supporting the shift to active travel by making it easier to walk, wheel, cycle and take public transport to NHS Scotland services for staff, patients and visitors.

5.4 Partnership Working

In 2022, the Sustrans Scotland NHS Workplace Engagement Programme continued with the aim of increasing active and sustainable travel by NHS Scotland staff and creating a culture where this is normalised. The following Health Boards are currently involved in this programme:

- NHS Dumfries and Galloway
- NHS Shetland
- NHS Grampian
- NHS Ayrshire and Arran

As part of this programme, Sustrans works with each Health Board to develop bespoke Active Travel Action Plans for the agreed NHS Scotland sites ensuring tailored, site-specific actions. The activities focus on:

- raising awareness of travel options, routes, information and support for employees interested in changing travel behaviour;
- empowering and enabling employees to consider alternative travel options for their everyday journeys;
- assisting employees to take action to experience travelling actively and/or sustainably;
- establishing strategic opportunities to embed in the core business of NHS Scotland and build legacy.

Key impacts from both past and present Health Boards involved in this Programme are outlined below.

Table 6: Examples of positive impacts in a number of Health Boards

NHS Dumfries and Galloway	Single occupancy car use as a main mode of travel to work has decreased from 71% at baseline (2017) to 59% in 2021.
NHS Shetland	Single occupancy car use as a main mode of travel to work has decreased from 77% at baseline to 51% (2020-2021). Between September 2019 and April 2022, staff have cycled 4,824 miles (7,764km) using the eBike network. Increase walking to work from 12% at baseline to 22% (2020-2021).
NHS Highland	Single occupancy car use as a main mode of travel to work has decreased from 64% at baseline (2016) to 53% in 2021.
NHS Lanarkshire	Cycling as a main mode of travel to work has increased from 2% in 2020 to 6% in 2021.

5.5 Bike use in Health Boards

As outlined in our strategy, NHS Scotland will enable staff, patients and visitors to make sustainable and active travel choices, for example cycling, where they can and work to make such travel options accessible to everyone.

Several Health Boards have already been working to enable active travel to and from their sites by making bikes available for use by staff and patients. A summary of bike use in some territorial Health Boards as of December 2022 is provided in the Annex.

As outlined in **the Annex**, Health Boards have made bikes available for personal loan by healthcare staff for commutes and leisure purposes; pool bikes for business use; and cargo bikes also for business use. In two Health Boards bikes are available for use by patients awaiting some types of surgery; for both weight management and mental health purposes. This work is still at an early stage and further progress is expected in future years in line with the strategy.

Bikes in NHS Lothian

NHS Lothian are trialling a fleet of e-bikes for business travel purposes as part of the Board's sustainability programme.

The 24 bikes being piloted comprise both leased and purchased bikes and will allow approximately 150 staff members to access this healthier and more environmentally friendly mode of transport. The bikes are based across a range of services. Some of the teams using the e-bikes include a Rapid Response Team, a Health Visitors team and a Community Mental Health team.
The e-bikes have a tracker to help understand patterns of use and help enable the pilot to be evaluated. There is also an app for users to support e-bike booking and report faults with the bikes.

NHS Lothian has shared relevant documentation from the pilot with other Health Boards and public bodies with the intention of accelerating the integration of e-bikes into business travel across the public sector.

Image 3: Examples of e-bikes in use in NHS Lothian

6. Greenspace and Biodiversity

NHS Scotland's outdoor estate is a major public asset. As of 2020, its estate was one of the biggest in Europe, with over 1,500 buildings including circa 200 hospitals and assets worth over £7.2 billion. The NHS Greenspace Demonstration Project 2013-2018, was established to show how improvements to outdoor spaces around existing and new hospitals and health centres could be delivered in practice and to assess the benefits of this investment for health and wellbeing, biodiversity and climate change. Work is now ongoing to build on this and realise the full potential of NHS greenspace across Scotland through improved data. National mapping of the whole NHS outdoor estate resource is underway and tools for measuring natural capital value and better managing the resource are in development. This will enable strategic priorities to be identified and support Health Boards in more sustainable management of the NHS estate which will improve outcomes for biodiversity, increase accessible greenspace and support adoption of nature-based solutions to protect and enhance biodiversity, contribute to climate action and improve health and wellbeing outcomes.

6.1 Greenspace and Health

The Our Natural Health Service Programme (ONHS) brings together health, environment and other organisations that provide infrastructure, supportive programmes or promote nature-based activities that can improve health and wellbeing. As part of ONHS, four pilot Green Health Partnerships (GHP) were established in 2018. Led by local health boards and local authorities, these partnerships bring together the health, social care, environment, leisure, sport and active travel sectors in order to make better use of local green space as a health-promoting resource

In 2021/22 the Lanarkshire GHP was integrated within the area health board ensuring the aims of the group can be continued longer term and securing more stable funding for core costs.

A further phase of funding was identified by ONHS partners to enable the Dundee, North Ayrshire and Highland GHPs to continue for two more years with an aim of securing a longer-term future.

In November 2022, the report Green Health Partnerships in Scotland – evaluation of the first three years was published by NatureScot. This will be used to support the work 'to establish and embed GHPs and similar approaches to increasing the use of nature-based solutions to deliver health outcomes'.

NHS Lothian has prepared a Greenspace and Health Strategic Framework (June 2019) and has been guided by the GHP approach. The framework led to a natural capital assessment in 2021 and more work to increase use of the NHS estate for nature-based activities. Other areas, including South Ayrshire, Perth & Kinross, Angus, Glasgow and Fife, have also been exploring how to develop a stronger focus on green health to contribute to better physical, mental and social health.

6.2 Green Exercise Partnerships

In 2021/22, Green Excise Partnerships, a collaboration between NHS National Services Scotland, Public Health Scotland, NatureScot and Scottish Forestry continued to support projects to demonstrate the benefits of improving greenspace at NHS sites. Funding was provided by the Scottish Government to support the following project at the Royal Alexandra Hospital in Paisley:

Case study – Royal Alexandra Hospital Paisley, NHS Greater Glasgow and Clyde - the Pond and Beyond project – phase 1

When the Royal Alexandra Hospital (RAH) was built in Paisley in 1988, the pond area was designed as a space for staff to relax, eat and socialise. However, over time, the pond became neglected and was no longer an inviting space. Invasive vegetation became overgrown within the pond, limiting habitat for wildlife.

In 2019 a project was started to revitalise the hospital's outdoor space which would include restoring the abandoned pond and woodland areas. The aims were to provide staff, patients and members of the local community with the opportunity to use the outdoor space, increase contact with nature and improve biodiversity.

Following delays caused by the Covid-19 pandemic, proposals were developed in consultation with staff and patients and plans made to carry out improvements in three phases. Construction of the first phase started in autumn 2021.

Completed work includes a new pathway around the pond, with a wooden boardwalk and interpretation signage; new benches and seating; natural play equipment; and a 'living archway' made from the canopy of existing trees. The improvements to the pond have created a quiet, reflective spot where staff, patients and members of the community can spend time in nature. There are areas for outdoor meetings and picnic benches. The new footpath around the pond provides access for an extended walk among the trees, wildflowers and wetlands. All these elements provide a wellbeing benefit to users.

Quotes from staff closely involved in the project:
"The pond is lovely to look at through the different seasons, especially when we have the swans, moorhens etc. Staff use the picnic tables, weather permitting. A member of staff commented that the pond was beautiful, calm and very peaceful."

"Staff take an interest in the wildlife that the pond brings – swans, ducks and last year a heron made an appearance."

The project has taken steps to enhance biodiversity, through diverse woodland and wildflower planting, the installation of habitat features including bird and bat boxes, and the clearance of invasive vegetation from the pond. The resident swans have returned, and cygnets have been born recently. Other wildlife which has returned to the pond include a heron, moorhens, and ducks.

It is intended that the expanded nature area at RAH will demonstrate the benefits of this approach for biodiversity, climate, and health and wellbeing. The longer-term

ambition is the development of an overall campus-wide sustainable management plan and approach, providing training opportunities for staff in managing the estate for improved biodiversity.

There are clear benefits to sustainable performance within many areas, including nature, biodiversity, and staff and patient wellbeing. The completed project is already well-used by staff and patients, and the presence of aquatic bird species demonstrates the additional habitat value for local populations. RAH is not alone in having a pond within the grounds, and this project provides a replicable example for similar projects across NHS Scotland.

Image 4: Pond and Beyond project before construction, Royal Alexandra Hospital Paisley

Image 5: Pond and Beyond project after construction, Royal Alexandra Hospital Paisley

Image 6: Pond and Beyond project after construction, Royal Alexandra Hospital Paisley

6.3 Actions underway

Work is underway to support NHS Scotland to take a more consistent and comprehensive approach to improving its greenspace. Public Health Scotland has been working with Health Boards to build a digital mapping tool to allow them to capture the different land use types on their properties. Public Health Scotland and NatureScot have also commissioned work on developing a natural capital assessment approach, to assess the health and wellbeing benefits of greenspace which could be used by the NHS and other organisations. This will allow a method for measuring the progress of improving the outdoor estate's contribution to health, wellbeing and biodiversity.

7. Sustainable Procurement, Waste and Circular Economy and (SPWCE)

The carbon footprint of the £2.4 billion worth of products and services procured by NHS Scotland each year is significant and is thought to account for greater than 60% of the total NHS Scotland footprint. We therefore also aim to maximise our contribution to Scotland and our supply chain achieving net zero emissions by 2045. NHS Scotland is not alone in this endeavour. NHS England has committed to achieving a net zero supply chain by 2045, and through the WHO's "Alliance for Transformative Action on Climate and Health" there are opportunities to work with other health services across the world to influence healthcare's global supply chain.

Work on sustainable procurement, waste management, and the circular economy has the potential to make the largest contribution towards the net zero goal. This workstream relies on joint working and expertise from NHS Scotland National Procurement, NHS Assure, Health Boards and other stakeholders.

In order to achieve our goals, NHS Scotland will need to work in partnership with its suppliers, changing the way it procures goods and the way it manages products and material on its sites and at the end of their useful life. Our strategy sets out the actions that we plan on taking. The following sections provide data which is available for 2021/22 and information on actions which have been taken.

7.1 Sustainable Procurement

During 2022/23, NHS National Procurement has engaged its suppliers and started to collate Climate Change Plans from around 40% of our top 100 suppliers, based on spend, and aims to reach 100% of these suppliers by the end of 2023.

NHS National Procurement has established a Sustainable Procurement Steering Group, which meets monthly, with a focus on identifying and progressing on social, environmental, and ethical considerations across all our procurement activities.

In July 2022, a Climate Change and Circular Economy Lead role in NHS National Procurement was created and appointed, with the aim to accelerate plans to move towards a net zero supply chain by 2040.

7.2 Circular economy

In 2021/22, the Scottish Government established an NHS circular economy programme. An early priority is the development of plans for reducing plastic use and ensuring that the plastics which are used by the NHS retain their value as a material instead of being recycled into materials of lower quality and functionality.

7.3 Waste Data

The NHS produces large volumes of waste. This includes clinical waste, which requires special disposal, and general waste. **Table 7** below sets out the total amount of greenhouse gases emitted for NHS Scotland from the disposal of Health Board's waste, as reported in Health Boards' Annual Climate Change and Sustainability Reports 2021/22. The data for individual Health Boards can be found

in the **Annex.** Over the last few years, there has been increased accuracy in the collection and reporting of data for clinical waste streams. In addition, reports and data are being obtained for a number of other waste streams. The Covid-19 pandemic also resulted in an increase in waste, particularly clinical waste.

There is also work underway to improve waste data collection, as this has been an area where there have been challenges. The table below sets out the current understanding, with the caveat that this is likely to change as data collection improves.

Table 7 - NHS Scotland greenhouse gas emissions from waste disposal Source: Health Board Annual Climate Emergency and Sustainability Report 2021/22

Amount of greenhouse gas (tonnes of CO2 equivalent) **(n) = number of Health Boards reporting**			**Percentage change since 2019/20**
2019/20	**2020/21**	**2021/22**	
3,115 (14)	3,333 (15)	6,271 (16)	Increase 101%

On 9 December 2022, NHS Scotland launched a waste management training package to help staff segregate and better manage the valuable resources in waste, such as high-quality plastic. This work was produced through a Short Life Working Group of Waste Management Officers and led by NHS Assure. It is the first national training package that has ever been in place for NHS Scotland. The aim of the training is to raise awareness of waste management within NHS Scotland and ensure there is understanding of the legal requirements for the handling, segregation, storage, and disposal of waste arising from NHS Scotland activities. The training supports national waste campaigns, which encourage the correct segregation of clinical waste, and builds on previous work on the Scottish Health Technical Note 3 on Waste in 2013 and the Waste Management Action Plan 2016-2020.

Throughout this reporting period, NHS Scotland Health Boards have continued to make use of the 'Warp-it' portal, which facilitates the transfer of goods such as office furniture and equipment that is no longer required by organisations from around the UK. This supports reuse of products, avoiding waste, and keeps products in the economic value chain for longer. Re-use has a significant carbon benefit as it avoids the carbon emissions associated with the manufacture and supply of new products, as well as avoiding the impacts associated with waste disposal.

7.4 Small Business Research Initiative on Reusable Personal Protective Equipment

The unprecedented use of PPE during the pandemic, and a reliance on single-use products, has resulted in a significant environmental issue around PPE.

To help make improvements to future PPE provision, the Scottish Health and Industry Partnership Group launched a Small Business Research Initiative ("SBRI") in 2021, funded by the Scottish Government and Transport Scotland.

The aim of the SBRI, which was launched virtually in March 2021 by the Minister for Business, Trade and Enterprise, Ivan McKee MSP, was to develop solutions that:

- aid prevention or reduce the spread of droplet and airborne biological hazards, thus reducing the need for PPE;
- reduce NHS staff reliance on single use disposable PPE; and
- allow the return of clinical procedures which are currently considered high risk because of their aerosol generating nature.

The SBRI was run by NHS Tayside, with seven companies being selected following open competition. Six of these progressed to the end of the first stage of the SBRI, which concluded in January 2023. NHS Tayside created a Test Bed for the assessment and evaluation of reusable PPE, along with technologies to assist in decontamination of the environment, to co-create and co-develop findings that could be adopted into clinical practice. Test beds offer real time access to professionals, varied clinical environments, and processes to determine how best to meet needs and create impact.

The SBRI Stage 1 helped develop products but did not take them as far as becoming medically and commercially approved. The SBRI highlighted some of the key issues that both companies and NHS Boards in Scotland face when wishing to introduce and procure reusable PPE. One of the main issues with face protection is the decontamination of the PPE, and the need for nationally adopted standards for this. Also, it became clear that meeting decontamination standards is not the only relevant criteria, and there is a need for a wider choice of well-designed and reusable PP3 level protection. This includes provision of customised face masks for staff who have difficulty fitting into standard mask fittings. At this stage, the market does not provide customised reusable masks that meet all relevant criteria, and further SBRI stages to develop reusable masks remain an option. These would depend on agreement by both NHS Tayside innovation and any companies involved.

In terms of decontamination devices, the overall conclusion was that no specific technology showed comprehensive evidence of efficacy and safety within healthcare environments beyond that of high-efficiency particulate air filter (HEPA) based systems. As the market already provides several options for decontamination, no current need for a further SBRI stage was felt to be required. If healthcare facilities wish to use other technology, the manufacturer must unequivocally prove safety and efficacy equal to decontamination standards.

8. Sustainable Construction

8.1 Sustainable Design and Construction Guide

On 4 October 2021, the Sustainable Design and Construction (SDaC) Guide was published to provide guidance for NHS Scotland Boards undertaking new and refurbishment construction projects, and to meet new requirements to address the climate emergency and sustainable development. NHS Scotland Assure has facilitated training seminars and workshops for NHS project teams.

Use of the SDaC became mandatory for Health Boards in August 2022.

In December 2022, NHS Scotland Assure published a single page overview of the SDaC highlighting key sustainability considerations for the healthcare-built environment.

The SDac has been integrated into the process for developing new NHS facilities.

8.2 Children's Theatre Suite, Ninewells Hospital

In 2021, the Scottish Government launched the draft fourth National Planning Framework which among many key policies called for the regeneration and reuse of existing buildings, and infrastructure to "improve wellbeing and transform our places", as well as minimising waste and reducing pressure on virgin resources.

The 2022 winner of the NHS Assure Design Excellence Awards was NHS Tayside Children's Theatre Suite at Ninewells Hospital. The selected site for the project was an old research laboratory used by the University of Dundee. It had some limitations which required extensive consultation. The outcome of this was design principles that put patient experience at its heart. The project demonstrated innovative approaches and the judges said that despite the constraints of redeveloping an existing single aspect 1970s hospital, the design team delivered a scheme which felt purpose built to provide the theatres next to the existing children's wards.

Sustainability is only one of the judging criteria for this award. Other criteria include urban design and public realm, wayfinding, circulation and waiting, materiality and value, light and ventilation (comfort), and futureproofing. However, the NHS Tayside Children's Theatre Suite provides an encouraging example of how retrofitting, as opposed to demolishing and rebuilding, which is likely to come with it a much greater impact on the environment, can provide, as one of the Anaesthetic Consultants stated, "a world class facility".

Image 7: External entrance to the Children's Theatre suite, Ninewells Hospital

Image 8: Anaesthetic Room, Children's Theatre suite, Ninewells Hospital

Image 9: Ward, Children's Theatre suite, Ninewells Hospital

9. Conclusion

We are faced with a triple planetary crisis of three interlinked issues - climate change, pollution and biodiversity loss. At the same time as meeting the immediate health needs of the people of Scotland, NHS Scotland must play its part in resolving the Climate Emergency and be resilient to changes to our climate.

As set out at the start of our report there has been a range of activity to set clear aims for NHS Scotland to respond to this emergency. In November 2021, the Cabinet Secretary for Health and Social Care committed NHS Scotland to the aims of the COP26 Health Programme; to become a climate resilient and low carbon, sustainable health service. The Scottish Government has also issued a new policy for NHS Scotland on the Climate Emergency committed to a 2040 net zero target, published the NHS Climate Emergency and Sustainability Strategy, and established a programme to implement the strategy's national elements.

There are signs of progress across Health Boards in ramping up climate and environmental action towards these aims. However, we have not yet fully mobilised the people and resources we need to deliver. This Annual Report for 2021/22 covers the action taken in that year and reflects the need for greater action across all areas.

The Cabinet Secretary for Health and Sport wrote to Chief Executives and Chairs of Health Boards in March 2023, to emphasise the importance of responding to the climate emergency and the interlinked crises of pollution and biodiversity loss and asking them to accelerate their mobilisation. Health Boards have also been asked to set out their planned actions in their Annual Delivery Plans and Medium Term Plans.

Healthcare can help lead the way in reducing the threat from climate change and realising the opportunities for health improvement from climate action. NHS Scotland is not alone in its efforts. Over 62 countries from all around the world have now signed up to the COP26 Health Programme including the United States, Germany and Spain. The NHS services of each of the four nations of the UK are working towards the same goal. There are opportunities to share the good work which NHS Scotland has performed, such as reducing desflurane usage and the Nitrous Oxide Project, and to learn from others who are facing the same challenges.

Finally, the people who work within NHS Scotland and use its services have fantastic ideas on how to make the NHS more environmental and socially sustainable. If you have an idea you wish to share, please do so at: www.nhssustainabilityaction.co.uk

ANNEX

National Sustainability Assessment Scores

Table 1: National Sustainability Assessment Tool Scores, 2021/22 Source: NHS National Services Scotland		
NHS Board[1]	**2020/21 Score (%)**	**2021/22 Score (%)**
NHS Ayrshire & Arran	71%	55%
NHS Borders	32%	15%
NHS Dumfries & Galloway	29%	39%
NHS Fife	59%	39%
NHS Forth Valley	48%	56%
NHS Grampian	41%	50%
NHS Greater Glasgow & Clyde	39%	48%
NHS Highland	30%	48%
NHS Lanarkshire	57%	67%
NHS Lothian	67%	68%
NHS Orkney	77%	76%
NHS Shetland	49%	52%
NHS Tayside	52%	41%
NHS Western Isles	63%	30%
NHS Golden Jubilee	32%	22%
The State Hospital	30%	15%
Public Health Scotland	-	18%
Healthcare Improvement Scotland	40%	49%
NHS National Education Scotland	51%	55%
NHS National Services Scotland	57%	67%
NHS 24	45%	47%
Scottish Ambulance Service	52%	25%

1) Health Boards highlighted in green had their 2020/21 scores reviewed. The remaining Health Boards opted for self-assessment in 2020/21 and had their 2021/22 scores reviewed.

Building Energy Emissions

Table 2 - Building Energy Use Emissions (tCO2e) Source: NHS National Services Scotland - National Energy Management System								
	2015/16	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22**	**Change 15/16 to 21/22**
Building fossil fuel use emissions	310,944	296,808	319,482	300,682	321,266	323,097	313,164	+ 0.7%
District heat networks and biomass emissions	9,045	7,693	3,975	3,233	3,734	3,212	3,196	-65%
Electricity emissions – generation, transmission, distribution	271,301	231,391	185,420	144,723	126,089	114,184	105,824	-61%
Total	**591,290**	**535,892**	**508,877**	**448,638**	**451,089**	**440,493**	**422,184**	**-29%**

NHS Greater Glasgow and Clyde
Table 3 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	78,153		74,167	-5.1%
District heat networks and biomass emissions	5,559		16	-99.7%
Electricity emissions	83,061		31,571	-62.0%
Totals	**166,773**		**105,754**	**-36.6%**

NHS Lothian
Table 4 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	46,878		48,484	3.4%
District heat networks and biomass emissions	0		72	
Electricity emissions	41,755		17,635	-57.8%
Totals	**88,633**		**66,191**	**-25.3%**

NHS Grampian
Table 5 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	43,083		44,983	4.4%
District heat networks and biomass emissions	1,444		484	-66.5%
Electricity emissions	22,740		6,030	-73.5%
Totals	**67,267**		**51,496**	**-23.4%**

NHS Tayside
Table 6 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	32,179		39,314	22.2%
District heat networks and biomass emissions	0		0	
Electricity emissions	23,358		4,564	-80.5%
Totals	**55,537**		**43,878**	**-21.0%**

NHS Lanarkshire
Table 7 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	18,820		18,458	-1.9%
District heat networks and biomass emissions	0		0	
Electricity emissions	16,975		7,346	-56.7%
Totals	**35,795**		**25,804**	**-27.9%**

NHS Highland
Table 8 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	21,718		20,391	-6.1%
District heat networks and biomass emissions	650		975	49.9%
Electricity emissions	13,645		6,232	-54.3%
Totals	**36,013**		**27,598**	**-23.4%**

NHS Ayrshire and Arran

Table 9 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	14,848		13,994	-5.8%
District heat networks and biomass emissions	445		512	15.2%
Electricity emissions	14,685		6,067	-58.7%
Totals	**29,977**		**20,573**	**-31.4%**

NHS Fife
Table 10 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	16,027		14,899	-7.0%
District heat networks and biomass emissions	368		167	-54.6%
Electricity emissions	11,969		5,329	-55.5%
Totals	**28,364**		**20,395**	**-28.1%**

NHS Forth Valley
Table 11 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	11,999		10,966	-8.6%
District heat networks and biomass emissions				
Electricity emissions	12,340		5,467	-55.7%
Totals	**24,339**		**16,433**	**-32.5%**

NHS Dumfries and Galloway
Table 12 - Building Energy Use Emissions (tCO2e)
Source: NHS National Services Scotland - National Energy Management System

	2015/16	**2020/21**	**2021/22**	**Change, %**
Building fossil fuel use emissions	7,399		11,453	54.8%
District heat networks and biomass emissions	193		145	-24.9%
Electricity emissions	6,274		3,024	-51.8%
Totals	**13,865**		**14,623**	**5.5%**

Medical Gases

Table 12 - N20 emissions (including Entonox) by Health Board, tCO2e Source – Scottish Government			
Health Board	**2018/19 (baseline)**	**2020/21**	**2021/22**
National Waiting Times Centre	192	315	91
NHS Ayrshire and Arran	1344	1480	1257
NHS Borders	632	489	548
NHS Dumfries and Galloway	722	500	565
NHS Fife	1493	1542	1465
NHS Forth Valley	1199	1188	1090
NHS Grampian	4112	3337	3985
NHS Greater Glasgow & Clyde	6448	5524	5065
NHS Highland	1191	885	1258
NHS Lanarkshire	2409	1943	2016
NHS Lothian	4608	4179	4272
NHS Orkney	90	69	109
NHS Shetland	114	75	100
NHS Tayside	2259	2237	2231
NHS Western Isles	127	111	202
Scottish Ambulance Service	1336	1133	1211
Total	**28,274**	**25,009**	**25,466**

Table 2: Volatile gas (desflurane, sevoflurane and isoflurane) emissions by Health Board, tCO2e **Source: Scottish Government**			
Health Board	**2018/19 (baseline)**	**2020/21**	**2021/22**
National Waiting Times Centre	23.9	19.4	22.1
NHS Ayrshire and Arran	569.2	104.8	77.6
NHS Borders	48.6	10.7	15.5
NHS Dumfries and Galloway	74.1	21.7	27.2
NHS Fife	123.4	55.8	49.9
NHS Forth Valley	171.1	38.2	40.9
NHS Grampian	1,014.60	209.2	222.3
NHS Greater Glasgow & Clyde	2,885.40	497.4	393.7
NHS Highland	154.4	35.9	43.3
NHS Lanarkshire	901.3	84.3	77.3
NHS Lothian	1,175.10	288.8	307.7
NHS Orkney	18.2	21.3	10
NHS Shetland	15.1	15.5	14
NHS Tayside	231.5	98.1	55.4
NHS Western Isles	17	0.9	8.7
Total	**7,423.00**	**1,502.00**	**1,365.50**

Desflurane emissions by Health Board, tCO2e **Source: Scottish Government**			
Health Board	**2018/19 (baseline)**	**2020/21**	**2021/22**
National Waiting Times Centre	5.4	6.3	5.4
NHS Ayrshire and Arran	508.2	78.6	34.8
NHS Borders	33	3.6	6.3
NHS Dumfries and Galloway	51.8	5.4	7.1
NHS Fife	67.9	25	8.9
NHS Forth Valley	115.2	8	0
NHS Grampian	896.6	145.6	151.8
NHS Greater Glasgow & Clyde	2,498.80	274.2	111.6
NHS Highland	100.9	0	0
NHS Lanarkshire	795.7	33.9	8.9
NHS Lothian	913.6	126.8	158.1
NHS Orkney	16.1	19.6	7.1
NHS Shetland	11.6	13.4	10.7
NHS Tayside	150	47.3	-5.4
NHS Western Isles	13.4	-0.9	5.4
Total	**6,178.20**	**786.8**	**510.8**
Negative numbers represent pharmacy returns			

Piped Nitrous Oxide emissions by Health Boards Source: Scottish Government				
Health Board	**FY 18-19**	**FY 19-20**	**FY 20-21**	**FY 21-22**
Golden Jubilee	180	130	290	-
NHS Ayrshire and Arran	538	558	699	542
NHS Borders	241	344	251	241
NHS Dumfries and Galloway	231	118	98	157
NHS Fife	188	316	393	217
NHS Forth Valley	246	447	197	64
NHS Grampian	1,601	1,687	981	1,310
NHS Greater Glasgow & Clyde	2,509	2,263	2,106	1,706
NHS Highland	359	364	251	403
NHS Lanarkshire	733	320	256	192
NHS Lothian	1,750	1,566	1,238	971
NHS Orkney	30	54		39
NHS Shetland	30	10	10	30
NHS Tayside	895	1,095	932	716
NHS Western Isles	59	113	64	128
Grand Total	**9,586**	**9,385**	**7,764**	**6,717**

Metered dose inhaler propellant

Emissions from MDI propellant prescribed and dispensed in primary care Source – Scottish Government				
Health Board		**2018/19**	**2020/21**	**2021/22**
NHS AYRSHIRE & ARRAN				
	MDI Total inhalers	341,496	321,008	331,386
	CO2 Equivalent (tCO2e)	**5,892**	**5,526**	**5,700**
NHS BORDERS				
	MDI Total inhalers	106,595	106,784	108,238
	CO2 Equivalent (tCO2e)	**1,840**	**1,840**	**1863**
NHS DUMFRIES & GALLOWAY				
	MDI Total inhalers	162,086	167,497	170,445
	CO2 Equivalent (tCO2e)	**2,885**	**2,961**	**3,002**
NHS FIFE				
	MDI Total inhalers	308,573	315,323	335,584
	CO2 Equivalent (tCO2e)	**5,431**	**5,511**	**5,828**
NHS FORTH VALLEY				
	MDI Total inhalers	214,866	222,993	235,084
	CO2 Equival	**3,926**	**4,079**	**4,272**

	ent (tCO2e)			
NHS GRAMPIAN				
	MDI Total inhalers	393,733	388,356	401,897
	CO2 Equivalent (tCO2e)	**7,380**	**7,377**	**7,626**
NHS GREATER GLASGOW & CLYDE				
	MDI Total inhalers	1,059,467	1,063,050	1,101,702
	CO2 Equivalent (tCO2e)	**18,202**	**18,244**	**18,894**
NHS HIGHLAND				
	MDI Total inhalers	251,466	238,109	239,913
	CO2 Equivalent (tCO2e)	**4,432**	**4,208**	**4,232**
NHS LANARKSHIRE				
	MDI Total inhalers	560,124	570,072	589,763
	CO2 Equivalent (tCO2e)	**9,691**	**9,832**	**10,156**
NHS LOTHIAN				
	MDI Total	705,366	684,477	697,476
	CO2 Equivalent (tCO2e)	**12,042**	**11,684**	**11,905**
NHS ORKNEY				

	MDI Total	17,209	15,495	15,810
	CO2 Equivalent (tCO2e)	**319**	**297**	**304**
NHS SHETLAND				
	MDI Total	19,407	18,297	18,810
	CO2 Equivalent (tCO2e)	**361**	**352**	**361**
NHS TAYSIDE				
	MDI Total	386,520	376,492	391,383
	CO2 Equivalent (tCO2e)	**6,741**	**6,551**	**6,794**
NHS WESTERN ISLES				
	MDI Total	22,594	22,862	23,747
	CO2 Equivalent (tCO2e)	**391**	**398**	**414**
Annual Total CO2 Equivalent (kg)		**79,535**	**78,860**	**81,351**

Table 8: Emissions from MDI propellant prescribed and dispensed in secondary care Source: Scottish Government		
Health Board		**2021/22**
NHS AYRSHIRE & ARRAN		
	MDI Total inhalers	7,892
	CO2 Equivalent (tCO2e)	135
NHS BORDERS		
	MDI Total inhalers	2334
	CO2 Equivalent (tCO2e)	40
NHS DUMFRIES & GALLOWAY		
	MDI Total inhalers	3665
	CO2 Equivalent (tCO2e)	63
NHS FIFE		
	MDI Total inhalers	7451
	CO2 Equivalent (tCO2e)	128
NHS FORTH VALLEY		
	MDI Total inhalers	6483
	CO2 Equivalent (tCO2e)	113
NHS GRAMPIAN		
	MDI Total inhalers	7003
	CO2 Equivalent (tCO2e)	124
NHS GREATER GLASGOW & CLYDE		
	MDI Total inhalers	38899
	CO2 Equivalent (tCO2e)	664
NHS HIGHLAND		
	MDI Total inhalers	4359
	CO2 Equivalent (tCO2e)	75
NHS LANARKSHIRE		

	MDI Total inhalers	14208
	CO2 Equivalent (tCO2e)	244
NHS LOTHIAN		
	MDI Total	21887
	CO2 Equivalent (tCO2e)	373
NHS ORKNEY		
	MDI Total	265
	CO2 Equivalent (tCO2e)	4.7
NHS SHETLAND		
	MDI Total	298
	CO2 Equivalent (tCO2e)	5.2
NHS TAYSIDE		
	MDI Total	10082
	CO2 Equivalent (tCO2e)	173
NHS WESTERN ISLES		
	MDI Total	465
	CO2 Equivalent (tCO2e)	7.9
STATE HOSPITAL		
	MDI Total	203
	CO2 Equivalent (tCO2e)	3.5
GOLDEN JUBILEE		
	MDI Total	526
	CO2 Equivalent (tCO2e)	9
Annual Total CO2 Equivalent (kg)		**2,162**

Travel and Transport

TABLE 5 – Health Board fleet greenhouse gas emissions Source – Health Board Annual Climate Emergency and Sustainability Reports 2021/22				
	Amount of greenhouse gas (Tco2E)			**Percentage change since 2019/20**
Health Board	2019/20	2020/21	2021/22	
Ayrshire and Arran	797	665	712	-10.66%
Borders	220	265	248	13.08%
Dumfries and Galloway	321	275	317	-1.00%
Fife	-	-	-	-
Forth Valley	379	453	296	-21.79%
Grampian	1026	941	1084	5.69%
Greater Glasgow and Clyde	-	4,628	1,365	-
Highland	**-**	-	-	-
Lanarkshire	756	739	600	-20.63%
Lothian	-	1402	1327	-
Orkney	66	67	46	-30.87%
Shetland	**-**	-	-	-
Tayside	769	754	767	-0.35%
Western Isles	-	-	-	-
State Hospital	-	8	19	-
Scottish Ambulance Service	20,557	17,956	19,791	-3.73%
Health Improvement Scotland	20	N/A - offices closed	Fleet reduced to zero	-100%
Golden Jubilee	**-**	-	-	-
NHS 24	12	-	-	-
National Services Scotland	1583.6	1585.6	1737	9.69%
Public Health Scotland	n/a	n/a	n/a	-
National Education Scotland	n/a	n/a	n/a	-

Table 6 – Health Board business travel greenhouse gas emissions Source: Health Board Annual Climate Emergency and Sustainability Reports				
	Amount of greenhouse gas (tonnes of CO2 equivalent)			**Percentage change since 2019/20**
Health Board	**2019/20**	**2020/21**	**2021/22**	
Ayrshire and Arran	1,886	870	1,182	-37.33%
Borders	586.33	358.35	376.05	-35.86%
Dumfries and Galloway	713.7	458	485.4	-31.99%
Fife	-	-	-	-
Forth Valley	601.7	419.8	438.5	-27.12%
Grampian	-	-	-	-
Greater Glasgow and Clyde	-	-	2873.2	-
Highland	**-**	-	-	-
Lanarkshire	-	-	-	-
Lothian	-	1172	1334	-
Orkney	-	-	-	-
Shetland	**-**	-	-	-
Tayside	-	-	877.8	-
Western Isles	-	-	-	-
State Hospital	-	-	-	-
Scottish Ambulance Service	637	473	363	-43.01%
Health Improvement Scotland	132	-	-	-
Golden Jubilee	**-**	-	-	-
NHS 24	118	-	-	-
National Services Scotland	974	98.5	148	-84.80%
Public Health Scotland	Not applicable – organisation formed April 2020	2.9	5.1	
National Education Scotland	163.4	17.7	23.9	-85.37%

Composition of NHS Fleet by Health Board, October 2022 Source: NHS National Services Scotland (National Fleet Management System), NHS Ayrshire and Arran, Scottish Ambulance Service					
Health Board	**Class**	**EV**	**Fossil Fuel/Hybrid**	**Total**	**% EV**
Ayrshire & Arran	Cars	10	203	213	5%
	Light Commercial Vehicles	8	98	106	8%
	Heavy Vehicles	0	2	2	0%
Borders	Cars	11	19	30	37%
	Light Commercial Vehicles	6	33	39	15%
	Heavy Vehicles	0	1	1	0%
Dumfries & Galloway	Cars	1	91	92	1%
	Light Commercial Vehicles	2	33	35	6%
	Heavy Vehicles	0	1	1	0%
Fife	Cars	4	47	51	8%
	Light Commercial Vehicles	24	48	72	33%
	Heavy Vehicles	0	0	0	0%
Forth Valley	Cars	18	40	58	31%
	Light Commercial Vehicles	25	50	65	38%
	Heavy Vehicles	0	0	0	0%
Grampian	Cars	2	173	175	1%
	Light Commercial Vehicles	5	104	109	5%
	Heavy Vehicles	0	18	18	0%
Greater Glasgow & Clyde	Cars	31	94	125	25%
	Light Commercial Vehicles	64	313	377	17%
	Heavy Vehicles	5	94	99	5%
Highland	Cars	43	346	389	11%
	Light Commercial Vehicles	9	219	228	4%
	Heavy Vehicles	0	3	3	0%

Lanarkshire	Cars	0	11	11	0%
	Light Commercial Vehicles	15	42	57	26%
	Heavy Vehicles	0	9	9	0%
Lothian	Cars	104	256	360	29%
	Light Commercial Vehicles	56	109	165	34%
	Heavy Vehicles	0	29	29	0%
National Services Scotland	Cars	0	21	21	0%
	Light Commercial Vehicles	3	40	43	7%
	Heavy Vehicles	0	14	14	0%
Scottish Ambulance Service	Cars	61	158	219	28%
	Light Commercial Vehicles	42	243	285	15%
	Heavy Vehicles	0	868	868	0%
	Motorbikes	0	3	3	0%
Shetland	Cars	11	33	44	25%
	Light Commercial Vehicles	6	11	17	35%
	Heavy Vehicles	0	0	0	0%
State Hospital	Cars	1	0	1	100%
	Light Commercial Vehicles	2	5	7	29%
	Heavy Vehicles	0	0	0	0%
Tayside	Cars	65	61	126	52%
	Light Commercial Vehicles	22	51	73	30%
	Heavy Vehicles	1	15	16	6%
Orkney	Cars	14	17	31	45%
	Light Commercial Vehicles	5	0	5	100%
	Heavy Vehicles	0	0	0	0%

Western Isles*	Cars	N/A	N/A	N/A	N/A
	Light Commercial Vehicles	N/A	N/A	N/A	N/A
	Heavy Vehicles	N/A	N/A	N/A	N/A
Total	**Cars**	**366**	**1577**	**1943**	**19%**
	Light Commercial Vehicles	**273**	**1411**	**1684**	**16%**
	Heavy Vehicles	**6**	**1054**	**1060**	**1%**
	Motorbikes	**0**	**3**	**3**	**0%**

Table 8: Bike Use in NHS Scotland Health Boards as at December 2022
Data from Sustrans Workplace Engagement Programme and Board returns from the NHS Scotland Sustainability Assessment Tool (except Ayrshire and Arran; Borders; Tayside; Western Isles)

Health Board	Bikes on personal loan to staff	Pool bikes	Cargo bikes	Bikes for Patient Use
Dumfries and Galloway	27	14	1	
Grampian	Bike initiative in place	35		
Highland	13		3	
Shetland	14			
Lanarkshire	68			Bikes provided (quantity not available)
Greater Glasgow and Clyde		Bike initiative in place		
Forth Valley		Bike initiative in place		Bike initiative in place
Lothian		24		
Fife	Bike initiative in place			
Orkney		Bikes provided (quantity not available)		
NHS Tayside		12		

Table 9 – NHS Greenhouse gas emissions from waste disposal
Source: Health Board Annual Climate Emergency and Sustainability Report 2021/22

	Amount of greenhouse gas (tonnes of CO2 equivalent)			Percentage change since 2019/20
Health Board	**2019/20**	**2020/21**	**2021/22**	
State Hospital	38	44	37	-1.58%
Scottish Ambulance Service	13	22	24	84.62%
Health Improvement Scotland	6	Not applicable – Offices closed	-	-
Golden Jubilee	-	-	-	-
NHS 24	11	-	-	-
National Services Scotland	28	31	47	71.01%
Public Health Scotland	Not applicable – formed April 2020	-	-	-
National Education Scotland	-	-	-	-
Ayrshire and Arran	325	389	384	18.15%
Borders	-	27.	37	-
Dumfries and Galloway	235	200	176	-25.37%
Fife	-	715	847	-
Forth Valley	271	650	233	-13.95%
Grampian	590	624	545	-7.72%
Greater Glasgow and Clyde	148	351	1766	1095.60%
Highland	-	-	-	-
Lanarkshire	54	51	652	1107.78%
Lothian	-	-	892	-
Orkney	48	39	42	-12.42%
Shetland	-	-	-	-
Tayside	1242	188	557	-55.13%
Western Isles (clinical waste only)	-	2	1	-

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