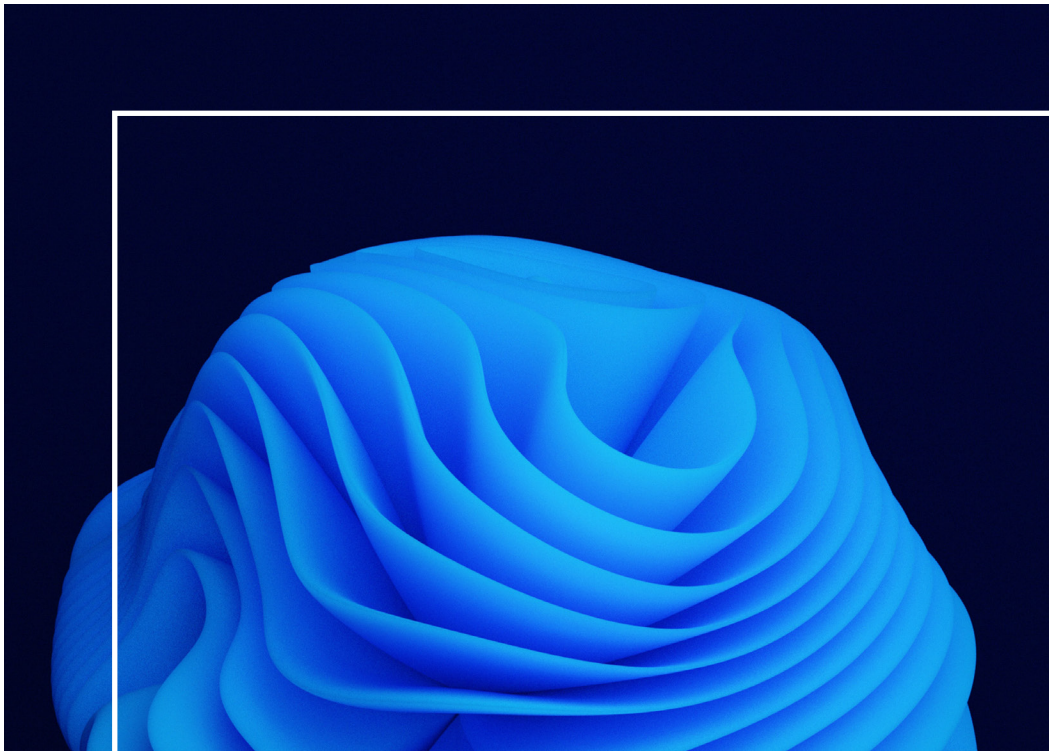


**HALSTON  
GROUP**



Entering the GreenTech Era:  
**TACKLING WASTE  
IN THE NHS**



Developing Data that Drives Healthcare Forwards



SUSTAINABILITY  
PARTNERSHIPS

**HG** Every year, the NHS produce approximately 156,000 tonnes of clinical waste that is either sent to high temperature incineration (HTI) or for alternative treatment (AT), which is equivalent to over 400 loaded jumbo jets of waste. This has a significant environmental impact and is associated with high running costs and carbon emissions. To help tackle this stemming issue, the NHS has introduced its NHS Clinical Waste Strategy in which some of the core targets include:



**ALL CLINICAL WASTE  
GENERATED BY NHS  
PROVIDERS IS REGULARLY  
REPORTED WITH A MINIMUM  
OF 95% ACCURACY BY 2024.**

**100% OF NHS TRUSTS TO  
HAVE A DEDICATED WASTE  
MANAGER ROLE BY 2023.**

**ALL NHS PROVIDERS  
INTRODUCE ARRANGEMENTS  
FOR THE MANAGEMENT  
OF THE OFFENSIVE WASTE  
STREAM BY 2023.**

**ACHIEVE A 50% REDUCTION  
IN THE CARBON EMISSIONS  
PRODUCED FROM WASTE  
MANAGEMENT BY 2026 AND  
80% REDUCTION BY 2028-32.**

# INTRODUCING NUGREEN



**HG** With such urgency associated with the targets, the NHS will need support to achieve these goals. NuGreen, a sustainable consultancy based in Cumbria, has already begun assisting the NHS in its waste reduction ambitions.

**NU** *Our vision is to create a truly sustainable healthcare sector, with strong, long term local networks. We are here to challenge the way of thinking about the environment, educate on options and help with taking steps towards a greener industry. We are not afraid to go where others have failed to go – this is where some of the greatest improvements can be found – we are addressing issues such as contaminated medical waste, improved environmental legislation and whole life cycle device management. By looking where others are not willing to look, we can discover areas for significant improvement and pave the road for future generations.*

*At NuGreen, we use a circular approach to deliver sustainability through our bespoke consultation process, educational packages, and research and development. The 'NuGreen Approach' has four stages and aims to help healthcare save money, reduce emissions, and increase the percentage of recycled materials.*

- 1. First, we collect data.*
- 2. Secondly, we analyse and interpret the data in-house.*
- 3. The third stage is the implementation stage where we collaborate with our partners to action sustainable change.*
- 4. Our final stage is to futureproof by analysing the progress of the implementation stage.*

# THE CARBON IMPACT OF WASTE

**HG** As specialists in the sector, NuGreen initially provides insight into the scope of the problem that is being faced in the healthcare sector when it comes to waste management.

**NU** **AN ARTICLE IN THE JOURNAL OF CLEANER PRODUCTION HAS CITED THAT DISPOSING OF OFFENSIVE WASTE EMITS 249KG CO<sub>2</sub>E/T WASTE, WHEN SENT TO LOW TEMPERATURE INCINERATION WITH ENERGY FROM WASTE (EFW). INFECTIOUS WASTE EMITS A HIGHER 569KG CO<sub>2</sub>E/T WASTE DUE TO THE WASTE REQUIRING TO BE AUTOCLAVED BEFORE GOING ON TO LOW TEMPERATURE INCINERATION AND EFW.**

*These numbers may seem small and insubstantial, but remember these figures equate to a small percentage of the annual waste output, 0.058% of the hospital's annual infectious production and 0.33% of its offensive waste production to be exact. If one were to extrapolate the numbers to an annual figure and by using the average of 46% incorrect, the hospital would be overspending £48,653 each year (£46,438 infectious and £2,215 offensive) and be unnecessarily emitting an extra 49.4t of CO<sub>2</sub>e (48.5t infectious and 0.9t offensive).*

*The emissions from both waste streams would be higher, if it were not for the offsetting caused by the production of energy from waste. This offsets roughly 167kg CO<sub>2</sub>e/t waste. In comparison, domestic waste when used for EfW only emits 172kg CO<sub>2</sub>e/t waste, which is 70% lower than infectious waste and 30% lower than offensive. As well as the emissions, domestic waste is far lower in cost than the other two waste streams. Although the price varies from contract to contract, on average the cost of disposal per kg of waste is £0.50 for infectious, £0.30 for offensive and £0.12 for domestic.*

*The issue is not the higher costs and emissions from infectious and offensive waste compared to domestic, the disposal methods are more cost and energy intensive so it is expected for them to be more expensive. The problem arises when waste is incorrectly segregated at disposal.*

**A RECENT WASTE AUDIT, WHICH WE CARRIED OUT AT A LOCAL HOSPITAL, SHOWED THAT OUT OF THE 155.57KG OF INFECTIOUS WASTE WE COUNTED, 71.76KG OF IT WAS DISPOSED OF INCORRECTLY.**

*That is 46% of infectious waste, by volume, which should have been disposed of in a domestic waste bin. In the same audit we counted 90.56kg of offensive waste, 41.43kg of that total should have been segregated into domestic waste, that is 46% incorrectly disposed of.*

*This means the, just from the waste we counted, the hospital overspent by £34.73 (£27.27 infectious and £7.46 offensive) on the disposal of their infectious and offensive waste, due to domestic waste being incorrectly segregated into those waste streams. As well the overspending, the hospital unnecessarily emitted an extra 68.73kg CO<sub>2</sub>e (61.76kg infectious and 6.97kg offensive) due to the incorrect segregation.*

# CORE CHALLENGES

**HC** Whilst Trusts and health care providers will differ in many ways, there are similarities in terms of waste management. Below, NuGreen has highlighted some stereotypical challenges that are faced by numerous health care providers.

**NU** 1. ***Incorrectly Segregated Waste***

*The data from our waste audits so far show a huge percentage of incorrectly segregated waste, with examples of 67% inaccurate by item. The challenge comes from hospital waste being disposed of by visitors and other members of the public, as well as the staff. Staff can be trained and developed by the NHS on correct segregation, but how do they educate the public? There is a general lack of education and understanding of the NHS Net Zero plan, by both the public and NHS employees. If people are unaware of what is required to reach Net Zero, targets will become harder to meet.*

2. ***Overuse of Single-Use Items***

*NHS moved away from reusable items, which are required to be sterilised before being used again, towards single-use items which come sterilised and can just be thrown away. From an IPC perspective the single-use method is an easy way to be compliant; however it comes at a great detriment to the consumption and disposal of materials. There are certain items where it is much more cost and carbon effective to revert back to the reusable option, such as the disposable tourniquet.*

3. ***Long-Term Contract***

*Long term waste management contracts tie the NHS down and block sustainable progress within their scope 3 emissions. Along with the long contracts, some waste management companies do not always fulfil their contractual obligations to separate and recycle waste. Our recommendation is for healthcare facilities to seek agility in their next steps, before signing traditional waste management contracts, given that there is so much technology available to change the way waste is managed; from increasing autoclaving capacity, small scale microwave sterilisation devices right through to larger onsite or close proximity machines for on location management. This would give autonomy back to the hospital, allowing them to manage costs and scope 3 emissions using the right tech and on the right scale for their site.*

# CORRELATIONS IN WASTE MANAGEMENT

**HG** After conducting various projects, there are no direct correlations found between Trusts in terms of waste management, but NuGreen has discovered correlations between hospitals within the same Trust.

**NU** *The main offender across each hospital has been the disposal of domestic and recyclable waste into infectious and offensive waste bins. Within those categories of domestic and recyclable waste being incorrectly disposed of, the top three items found were medical packaging, surface wipes and paper towels.*

*Medical packaging is sterile packaging, usually found in the form of a blister pack consisting of paper and plastic. It has had no contact with the patients and should be placed into the domestic bin, once all contents are removed, or separated for recycling where available. From surveying the hospitals and staff, we have gathered that this is mainly due to two reasons. One, it is convenient to pack all packaging, PPE and equipment used to treat a patient together and dispose of all of it into one bin. Two, there isn't enough access to domestic or recyclable waste bins within treatment rooms or patient beds.*

*Paper towels are there for drying hands after they have been washed. Often infectious or offensive waste bins are placed next to sinks, and when there are no other bins or they are the closest, it is completely understandable as to why paper towels end up in the incorrect waste streams.*

*Surface wipes, as they are namely called, are there to wipe down and sanitise surfaces e.g. desks, chairs, and keyboards. The surface wipes we have been recording as incorrect, are a well-known branded wet wipe, which comes packaged and soaked in an anti-viral solution. These wipes, if unsoiled, should simply be placed into a domestic waste bin.*



# STAGES OF WASTE MANAGEMENT ANALYSIS

**HG** With so many components contributing to the overall waste volume, it's integral to investigate the core contributors and understand the root cause of the problem. NuGreen supports Trusts with in-depth investigations to identify areas that require action.

**NU** We believe good data is the foundation for effective change; data creates a baseline to highlight key areas of best practices and areas of concern. By analysing this data, we can make informed decisions to implement long term sustainable change. This is why we take a four-stage approach when tackling waste management.

## **Stage 1 - Collect**

The first step is to collect the data through waste audits, questionnaires, stakeholder interviews and other research.

## **Stage 2 - Analyse**

Secondly, we then analyse and interpret the data in-house to identify impact areas, behaviours, and patterns within waste disposal practices.

## **Stage 3 - Implement**

Thirdly, we work with our partners to create change campaigns, educational programmes, sustainability strategies, and innovative waste management solutions to set them up for the future. The implementation plan we design is pulled from the raw data we collected and our own external research.

## **Stage 4 - Futureproof**

Sustainability is not a one-time action, it is a continuous effort. Our final stage is to futureproof the work we have done and analyse the success of the implemented campaigns and strategies, by reauditing the same criteria. By comparing the results with the baseline data, we can tangibly track meaningful change and create quick

*interventions where necessary. This is important as our approach needs to be kept dynamic, responding to the ever-changing progress.*

*Through this approach we gain a holistic overview of a hospital's or trust's waste stream, create robust strategies with data driven decision and science base targets to generate positive sustainable change, and ensure long term sustainable success within their waste management.*

**HG** The NHS creates an immense amount of data, but through NuGreen's expertise, they are converting this into actionable insight that is accessible. It also supports more granular targets that are specific to an individual Trust.

**NU** With our collated data, we will be able to highlight where sustainable change needs to happen. We can give insight into the impact of costs and emissions from their waste disposal, how much of that impact is due to incorrect segregation and the behaviours behind it, and the consumption and flow of materials.

*From the baseline data, the NHS can make data driven decisions to create science-based targets and robust strategies to action positive sustainable change and determine where investment is needed. For example, if it was highlighted that there is a large overconsumption of disposable gloves, they would know to invest in a 'Gloves Off' campaign to reduce consumption.*

*From a behavioural perspective, the NHS will be able to educate and develop staff on sustainable topics, by identifying where training is required from the data. Education and employee engagement are vital to push through sustainable change; continual staff development will drive it through for the long term. Staff need to both be aware and buy into the NHS Net Zero plan, for it actioned effectively.*

**HG** Due to the immense size of the NHS, it can often become siloed between departments, and hard to coordinate activities across a group. NuGreen is able to provide a more holistic view of waste operations that can even be drilled down to pinpoint departmental data to understand the operational flow better and make those all-important changes.

**NU** *We take a bottom-up approach to sustainability. Everyone creates waste, so waste is where we start. By looking at and auditing waste, we give insight into the worst and best performing areas across the Trust. This data is localised by department and ward too, which negates the need to make assumptions, giving the baseline data a high degree of accuracy. This also enables us to assist with the supply chain as we can physically see the flow of materials.*

*But we don't just collect the data and then hand it over, we follow our four-stage approach. Once we have analysed the data, we create bespoke training modules and tailored change campaigns, designed*

*to improve the highlighted impact areas. We will also personally carry out the training modules for our partner's employees, and design and implement the marketing material for the change campaigns e.g. if a Trust is disposing of hand towels into infectious waste bins, we may carry out training on waste segregation and design displays to go above bins which nudge people into disposing of their hand towels correctly. By following our fourth stage of futureproofing, our reaudits not only track the progress of previous stages against the baseline data, but also track seasonal and outbreak trends.*

*Along with our four-stage approach, we are working and carrying out research to build circularity within healthcare waste through on-site sterilisation. On-site sterilisation machines, as well as sterilising, blend and reduce the volume of the waste into a material called floc. This material has the potential to be used in low carbon construction, which could help retrofit hospitals when it comes to renovation.*

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# OUTSOURCING: THE DOWNFALLS

**HG** It has become common practice for Trusts to outsource their waste management, but through NuGreen's investigations, it may not necessarily be the best course of action when looking to mitigate the carbon footprint associated with waste management. So why is it that outsourcing is still commonplace?

**NU** *In our view, there are two main reasons:*

*Firstly, there is a conception of 'because that's how it's always been done'. This can be a dangerous attitude to have, especially when we need to evolve our practices to become sustainable and meet Net Zero. But you can see why there is this attitude towards waste management: At home our bins are collected weekly and taken away, restaurants and shops leave their bins outside to be taken away, and the bins from our offices are treated the same; so why should healthcare be any different? In reality, insourcing waste management should not only apply to healthcare. Several solutions would apply to organisations of all different sizes and industries.*

*The second reason is that healthcare waste comes with a stigma, compared to other industries, due to the nature of the waste it produces. It is a lot easier to picture healthcare waste being handled by a clinical waste specialist in a covert location, rather than it going through a sterilisation machine in a hospital car park. Managing waste is a permitted and legislated activity. Initially the only option was to pay for removal via a waste management facility, but new tech has moved this process along whereby material can be sterilised/decontaminated on-site and the future sees a potential for this waste to become a resource.*





# EDUCATION TO EMBRACE SUSTAINABILITY

**NU** *We believe that people are key to creating sustainable and resilient communities. The world needs more education and a better understanding of sustainability and the Net Zero plans, not just for people within healthcare but for everyone. Education can empower people to become sustainability champions within their workplaces and communities.*

*From our experience and data, a lack of awareness of the rules and reasons for correct waste segregation is one of the biggest causes of incorrect segregation. If there was a greater understanding of the processing of different waste streams, we would find less recyclable and domestic waste being placed into bins destined for autoclaving and incineration. If you give people the power of education, they would be able to make well-informed decisions on waste disposal.*

*The NHS was the first health service to commit to reaching carbon net zero. It is an ambitious and commendable commitment, but ineffective if not filtered down to everyone within the NHS. We carry out staff questionnaires in tandem with our audits, and from their responses there does not seem to be a tangible connection between employees and the NHS Net Zero plan. Many were aware of the strategy's existence, but were unaware of what they needed to do for it or how it affected their day to day working lives. A robust strategy needs employee buy-in and understanding to work effectively, and that is exactly what we intend to help with in our work with the NHS.*

**HG** NHS and other health care providers are going to need to redefine the way they conduct waste management, and undertake numerous projects to tackle their carbon impact, but first of all, they need accurate data that pin points areas of concern.  
**NuGreen will support this journey to pave the way for a greener NHS.**



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