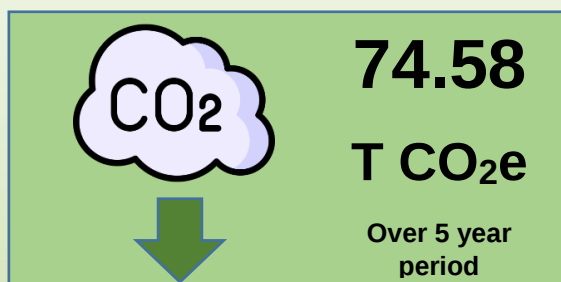


National Green Theatres Programme

Prògram Nàiseanta Lannsaireachd Uaine

Transitioning from single-use to reusable air-assisted mattresses for patient transfer

September 2025



1. Description of action

- 1.1 This action aims to reduce the environmental impact associated with transferring patients using air-assisted mattresses, by transitioning from single-use to reusable devices.

2. Background

- 2.1 Hover mattresses are medical devices (class II) designed to assist with patient movement, more commonly used to transfer bariatric patients. The devices allow patients to be moved safely and comfortably reducing the risk for both the patient and staff¹. Currently these devices are designated as single patient use (SPU), meaning after each use the devices are thrown away.
- 2.2 The devices are commonly used across NHS Scotland, in the past year over 3,390 (SPU) devices were ordered through National Procurement, incurring costs just under £340,000². In addition to the financial impact, the devices generated over 2.3 tonnes of physical waste, adding strain to Scottish waste streams. Furthermore, this corresponds to almost 16 tonnes of embodied carbon annually. It is important to note that this figure accounts solely for cradle-to-gate emissions; incorporating the use and end-of-life phases of the devices lifecycle would result in a higher overall carbon footprint. From both a financial and environmental standpoint, the case for transitioning away from the current linear, disposable model is clear. Adopting more sustainable, circular solutions presents an opportunity to reduce costs, minimise waste, and lower carbon emissions for NHS Scotland.
- 2.3 In an effort to address the issue the Gynaecology theatre department within NHS Highland began exploring alternatives to the SPU devices. Upon auditing their usage they identified that on average 15 SPU devices were being used per month, generating over 10kg of waste³ and costing around £1,500⁴. The solution proposed was to move to a reusable model that could be wiped down after each use and, where necessary, laundered. The reusable devices

¹ [HoverMatt® - HoverTech International](#)

² Based on National Procurement Data accessed October 2024.

³ Average weight of devices at 0.693kg

⁴ Average cost across the available devices.

required upfront capital but the team within NHS Highland identified the costs could be recouped in approximately 20 uses of the reusable device. Additionally, the reusable devices are on the national framework making the process simpler for purchasing the devices.

2.4 The team in NHS Highland received support from key stakeholder groups (see 3.1) to order two reusable devices and began trialling them in the department in August 2024. To support the trial, a Standard Operating Procedure (SOP) was developed ahead of the devices being used to ensure team members had knowledge of the cleaning regimes required. The SOP developed by the team is available within Appendix 2 of this document. It was also essential to engage with Infection Prevention Control (IPC) colleagues to ensure they were aware of, and consulted on, the change. Local IPC colleagues conducted a local risk assessment and provided advice on how to safely manage the change in practice.

2.5 Initial feedback from the trial has been very positive; the team within NHS Highland now intends to purchase a further 4 reusable devices. It is predicted that 6 reusable devices will cover the 10 theatres within their unit and allow for the successful transition from single use to reusable patient transfer mattresses.

2.6 Figure 1 provides an overview of the key characteristics of the SPU and reusable devices. The data highlights that switching to reusable devices will reduce waste generated, reduce raw material extraction, and thus reduce carbon emissions. Additionally, based on the pilot work from NHS Highland which suggests 6 devices is sufficient to cover 10 theatres, we can infer that there would be a requirement for a minimum of 232 reusable devices to cover the 386 theatre estate within NHS Scotland⁵. This, of course, is indicative and demand will vary by board and department.

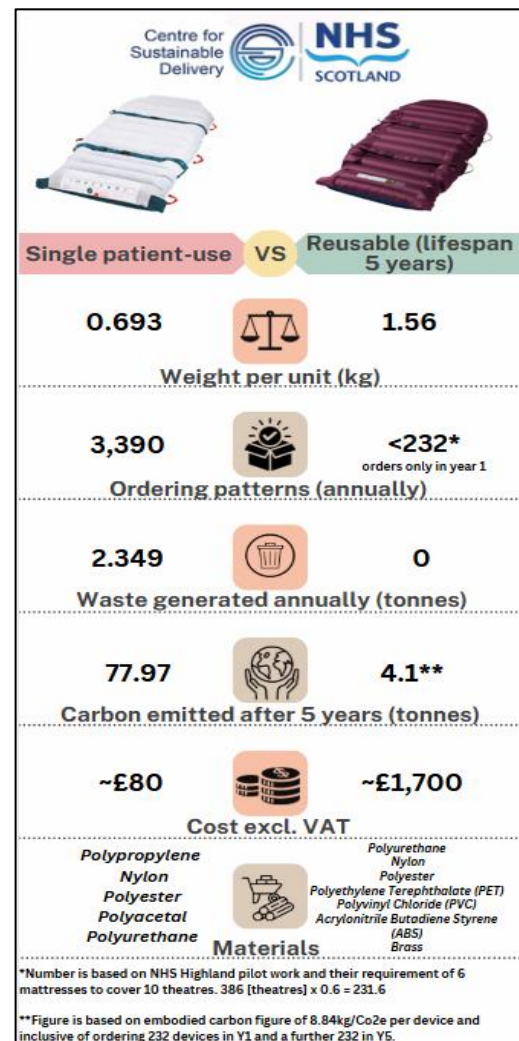


Figure 1 – key characteristics of SPU vs Reusable Hovermattress

⁵ Theatre number accurate as of January 2025 and sourced through Measurement discussions within the NGTP.

2.7 Figure 2, below, uses the indicative cost projections across a 10 year period. This provides clear evidence of the long-term savings achievable through investment in reusable devices.

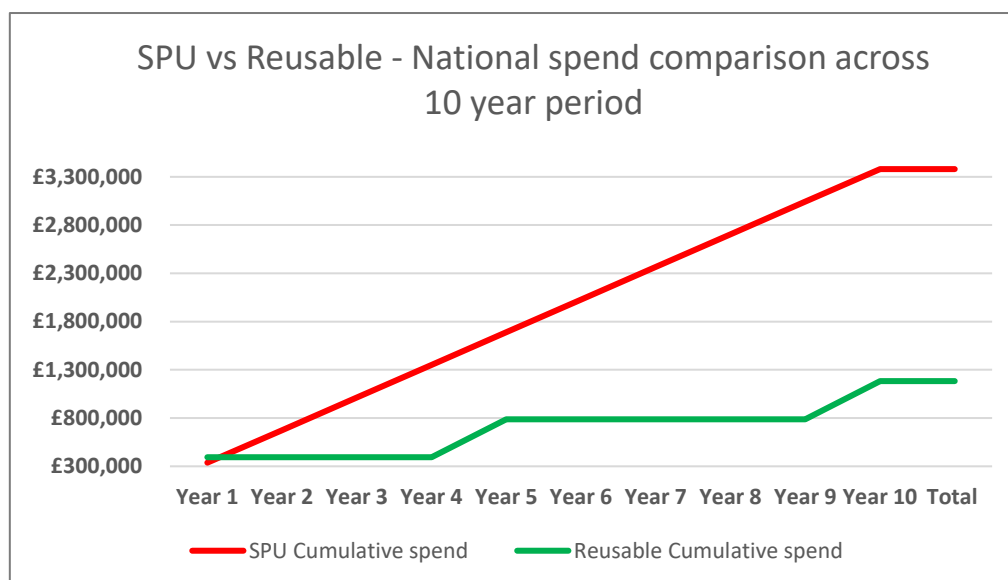


Figure 2 – national spend across 10 year period

2.8 To conclude, this paper recommends that Health Boards assess their current demand for, and usage of, SPU devices and evaluate the feasibility of transitioning to reusable alternatives. The shift would lead to a reduction in the extraction of raw materials and, consequently, lower the volume of pollutants entering Scottish waste streams. Additionally, Health Boards stand to achieve significant long-term cost savings.

3. Who needs to be involved in this change locally?

3.1 To allow for successful transition it is recommended that the following stakeholder groups be consulted:

- **Nursing teams and Operating Department Practitioners** - colleagues will provide on-the-ground support and will be heavily involved with implementing the change and adopting new cleaning protocols.
- **Infection Prevention Control** – colleagues should be made aware as soon as possible to ensure local risk assessments can be conducted to ensure safe practice and where necessary implement monitoring controls.
- **Procurement** – colleagues should be alerted to the change to ensure new devices are ordered and previous ordering patterns amended. Procurement colleagues may also engage with suppliers at this stage.

- **Laundry services** – although the devices will predominantly be decontaminated following manufacturer's instructions and local and national decontamination guidance, in cases where the devices are heavily soiled they are suitable for laundering. Ensure that manufacturers reprocessing guidance is followed and local laundry services consulted before laundering.
- **Finance** - should be consulted to ensure that initial capital is available to invest in the reusable devices.
- **Surgeons** – should be consulted to address any possible concerns they may have.
- **Anaesthetists** - should be consulted to address any possible concerns they may have.

4. Boundaries

4.1 The table below identifies the boundaries for this action:

In scope	Out of scope
• All theatre departments across NHS Scotland.	• Can be determined at a local level.

5. What is the change and how will it be implemented?

5.1 The proposed change is a move from single patient use transfer mattresses to reusable alternatives. This change will be driven by clinical colleagues and implementation will be achieved through collaboration with the key stakeholders outlined in section 3.

6. What are the potential co-benefits of this change?

Outcome	Potential Benefits
Carbon Savings	74.58 tonnes of embodied carbon saved over 5 year period
Cost Savings	£901,340 spend reduction across a 5 year period
Staff experience	Good communication during implementation phase will be important alongside setting clear expectations to ensure no negative experience felt by staff who are required to wipe down reusable devices.

7. Risks and Issues

7.1 As part of the development of this action there has been one risk identified to date, outlined below:

Description of risk or issue	Mitigation / Action Plan
• Risk that the reusable devices are not cleaned properly leading to higher risk of infection.	• Early engagement with IPC colleagues and risk assessment conducted, where appropriate. Training designed in collaboration with IPC colleagues to ensure alignment with guidance.

• Risk that health boards do not have the capital required to invest in reusable devices.	• This Opportunity for Change will be shared with finance colleagues in each health board outlining the invest to save proposal.
• Risk that local laundry services don't accept the reusable devices when they are required for full clean due to soiling.	• Health Boards should engage with their local laundry services before purchase to ensure the service has the ability and capacity to reprocess the devices.

8. Implementation Guidance

- 8.1 The Opportunity for Change highlights the importance of implementing this action. This change will help your site and NHS Scotland achieve net-zero emissions by 2040 as stated in NHS Scotland's Climate Emergency & Sustainability Strategy 2022-2026.
- 8.2 Below the National Green Theatres Programme has provided guidance on how you can implement this change within your area. If you require any further information or guidance, please contact the National Green Theatres programme team on: cfsdgreentheatres@gjnh.scot.nhs.uk

Local Sustainability or Green Theatre Group:	
1.	Review opportunity for change and validate what this means locally.
2.	Provides National Green Theatre Programme Team with validated information/local targets.
3.	Convene a discussion with the staff who need to implement it and those who are impacted by the action.
4.	Understand what the opportunity is for implementing the action locally: work already undertaken and challenges.
5.	Agree a local implementation plan.
6.	Implement local plan.
7.	Provide data as per measurement plan.
8.	Monitor implementation of action.

9. Evidence

Appendix 1: Carbon calculations of both single patient use devices and reusable devices

SPU Device	Material	Weight of materials per device (kg)	Carbon emissions factor (kg/Co2e) – ICE Database figures	Carbon emission factor per device (kgCo2e)
	Nylon (50.3%)	0.348	9.14	3.18072
	Polypropylene (26.7%)	0.185	4.49	0.83065
	Polyester (4.6%)	0.032	5.56	0.17792
	Polyacetal (6.5%)	0.045	2.19**	0.09855
	Polyurethane (12%)	0.083	3.76	0.31208
	TOTAL WEIGHT*	0.693		4.59992
	* Based on avg of 3 avail. sources			
	** https://www.sciencedirect.com/science/article/pii/S2095809923004629			

Reusable device (Double – coated)	Material	Weight of materials per device (kg)	Carbon emissions factor* (kg/Co2e)	Carbon emission factor per device (kgCo2e)
	Nylon(28.8%)	0.45	9.14	4.113
	Polyurethane (52.9%)	0.83	4.84	4.0172
	PET (0.7%)	0.01	2.08	0.0208
	PVC (13.5%)	0.21	3.1	0.4599
	Polyester (0.1%)	0	5.56	0
	ABS Plastic (3.8%)	0.06	3.76	0.2256
	Brass (0.2%)	0	2.64	0
	TOTAL WEIGHT*	1.56		8.84

*Taken from Inventory of Carbon Emissions database

Appendix 2: NHS Highland SOP

This is an example that Health Boards may refer to and adapt to suit local policy.

Title	Cleaning and maintenance of reusable HoverMatts	
Date	August 2024	
Reason / Background for SOP: HoverMatts are used for the moving and handling of patients weighing over 100kg. At present we only use single use HoverMatts, costing £88 each with an average use of 15 units per month, totalling £15,840 per year. We are introducing brand new reusable HoverMatts which should be cleaned and maintained in theatres between use, but can be sent to laundry for a “deep clean” once per year or when heavily soiled. The cost of one HoverMatt will be regained after around 20 patient uses and from then on will bring financial savings every year as well as a reduction in waste.		
Step	Operating Step	
1	Routine cleaning of HoverMatts between patient use. To be decontaminated as per local policy for patient care equipment. **Where blood and/or body fluid contamination occurs, undertake disinfection of the device using the appropriate product in accordance with manufacturer’s instructions and local policy for the decontamination of patient care equipment** NOTE: Risk assess the risk of blood and bodily fluid leakage and mitigate using a sheet and absorbent pads.	
2	Sending of HoverMatts to laundry services. **Local laundry service approval required** If a reusable HoverMatt becomes heavily soiled, it can be sent to laundry services. Follow locally agreed policy and process for laundry management of the device. The below information is specific to the process set up and agreed within Raigmore Hospital, NHS Highland. This process will vary from board to board and in agreement with laundry services: - Place HoverMatt in large clear plastic bag, and clearly label with “Theatre HoverMatt single wash, do not tumble dry” - Use Synbiotix to request a theatre orderly to take the HoverMatt down to laundry services.	

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|--|---|
| | <ul style="list-style-type: none">• The HoverMatt will be returned the same day, or morning after. Laundry services will page 1089 to inform theatre staff that it is ready for collection. 1089 page holder should then use Synbiotix to request a theatre orderly to collect from laundry services. |
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