

# National Green Theatres Programme

Prògram Nàiseanta Lannsaireachd Uaine

## Automated switch off out of hours of Anaesthetic Gases Scavenging Systems

### Opportunity for Change

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*An opportunity to save across NHS Scotland:*



**232**

Tonnes of  
CO<sub>2</sub>e



**£270,000**

## 1. Description of action

- 1.1 This action relates to the management of anaesthetic gases scavenging systems (AGSS) installed in theatre suites across Scotland.
- 1.2 There is a potential that AGSS are left running when theatres are not in use, consuming energy and unnecessarily increasing a health boards carbon emissions.
- 1.3 Steps should be taken to switch off out-of-hours which will provide the co-benefits of reducing carbon emission and reducing costs through reduction in electricity used to run systems when not needed.

## 2. Background

- 2.1 Modern surgical theatres have been equipped with AGSS since concerns over occupational exposure to Nitrous oxide were raised in the 1980s.
- 2.2 Some hospitals have installed automated controls with local over-ride, but many units have person-specific protocols for management that are inherently unreliable, meaning these energy expensive systems can remain switched on 24/7.
- 2.3 A typical AGSS suction pump consumes 500 - 800W of power per hour<sup>1</sup>, a running energy cost roughly five times higher than a 65" LED TV.
- 2.4 Instituting automated systems with occupancy sensors would potentially reduce AGSS energy consumption by 66%. The appendix identifies the potential financial and carbon savings for each health board based on a 50% reduction in running time due to implementing automated controls.

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<sup>1</sup> Pierce T. Domestic energy consumption. Anaesthesia News. 2018; 370

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

3.1 In order to implement this action it is recommended that the following groups should be consulted and involved:

- Anaesthetists;
- Surgeons;
- Theatre staff / managers;
- Estates and Facilities;
- Engineering leads;
- Infection prevention and control.

### 4. Boundaries

4.1 The table below identifies the boundaries for this action:

In scope	Out of scope
All surgical suites across NHS Scotland	Emergency theatres that must run at optimum capacity

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

5.1 Hospital sites will ensure AGSS are switched off out-of-hours.

5.2 This should be implemented at all sites, ideally this should involve linking to automatic controls on-site to make these changes safely.

5.3 On older sites a costing must be determined to retrofit the system before the change is implemented. However where possible a manual process should be developed to ensure there is no delay in achieving the co-benefits identified in 6 below.

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

6.1 The table below identifies the potential benefits at a national level that could be achieved if this action is implemented.

Outcome	Potential Benefits
Carbon reduction	As per the appendix, if this opportunity for change is realised, nationally NHS Scotland will prevent 232 tonnes of carbon being released into the atmosphere annually.
Cost Savings	As set out in the appendix, the implementation of this opportunity for change will save NHS Scotland £270,508.80 annually.
Patient outcomes	The building management system will ensure the correct settings are in place ensuring there is no change to patient outcomes or experience
Staff Experience	As the implementation will be controlled via the building management system there will be no direct impact on staff when action is fully implemented.

6.2 The potential carbon and cost saving for NHS Scotland is available in appendix 2. Health boards have been provided board level information on the potential savings opportunities.

## 7. Risks and Issues

7.1 As part of the development of this action risk and issues have been identified below:

Description of risk or issue	Mitigation / Action Plan
Older hospitals will have to retrofit these changes through their BMS systems at a cost and as such the change is not taken forward.	Discussions will take place with the engineering and finance networks to identify the scale of the issue and determine ways to break through the barriers to change

## 8. Implementation Guidance

- 8.1 The opportunity for change highlights the importance of implementing this action. This modification 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](mailto: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.

## Appendix 1 – Measurement plan

Name of measure (carbon, cost, staff experience and patient outcomes)	Type of measure (Outcome, Process, Balancing)	Concept being measured?	Where is the data available from?	Who is collecting the data?	Frequency of collection?
Carbon	Outcome	The number of theatres within each board that have implemented the automated switch off of AGSS.	Board Contacts	Health Board collects their own data to be made available to CfSD.	Quarterly
Financial Savings	Outcome	The number of theatres within each board that have implemented the automated switch off of AGSS.	Board Contacts	Health Board collects their own data to be made available to CfSD.	Quarterly
Staff Experience and Engagement	Process	Staff pushback.	Verbal	NHS Boards who then feedback to the SDG.	Quarterly

## Appendix 2 – Potential Savings

	Operating Theatres	Total cost assumed at all units running 24/7 per annum	Total cost at 50% running reduction	Saving per annum	Total carbon omitted assumed at all units running 24/7 (tCo2e)	Total carbon omitted at 50% reduction in running time (tCo2e)	Carbon saving (tCo2e per annum)
Total for NHS Scotland	386	£541,017.60	£270,508.80	£270,508.80	463.9	232.0	232.0

The above calculations are based on the following assumptions:

\*Figures are based on each AGSS unit running 24 hours a day at an average of 650W per hour and an average energy purchasing price of 0.246p/per kW

\*Figures are based on 211.07g of Co2 being omitted per kWh

\*Total costs assumed where boards have not already implemented the change