Design for Life: Reuse as a case study

Michael Hopkinson

Head of Supply Resilience and Sustainability

Medical Technologies Directorate

Department of Health and Social Care
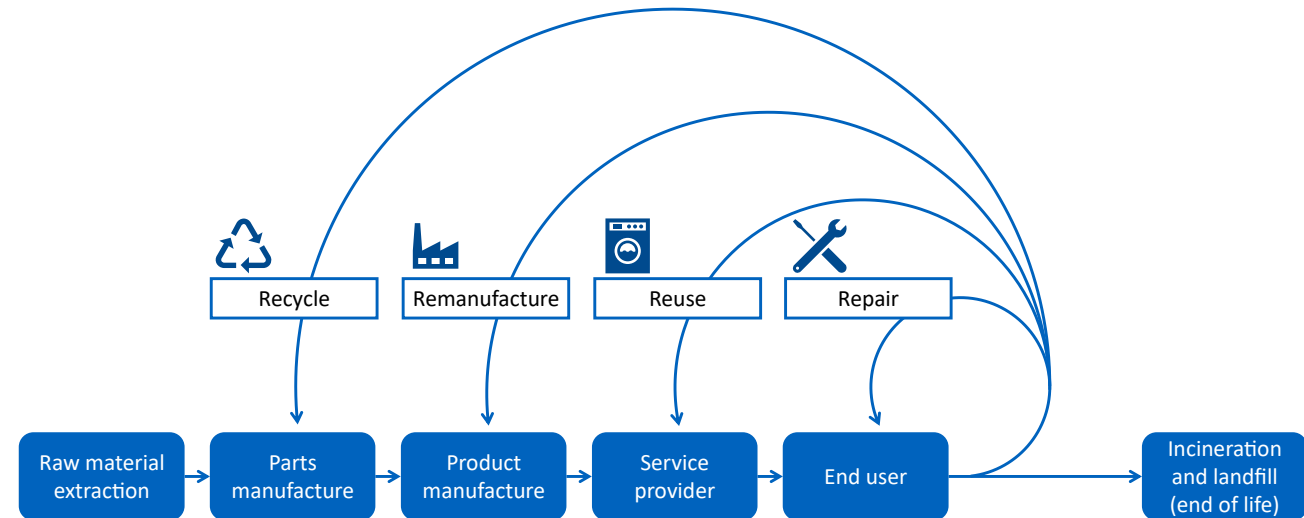
Rachel McLean

Sustainability in Quality Improvement (SusQI) Programme Lead

Centre for Sustainable Healthcare

What is Design for Life (DfL)?

The government programme to build a circular economy for medical products by 2045

Within the **Circular Economy** principle of maintaining products in their highest value state for as long as possible, Design for Life will specifically focus on:

- **Reuse:** the repeated use of a product for its intended purpose through processes such as sterilisation.

- **Remanufacture:** Returning a product to as-new condition with the same, or improved, level of performance.

- **Recycling:** Disassembling a product into its basic components, materials, or substances to be used again in the medtech sector or beyond.

Recycle	Remanufacture	Reuse	Repair

Raw material extraction → Parts manufacture → Product manufacture → Service provider → End user → Incineration and landfill (end of life)

Definition of 'medtech products'

All devices, PPE and other physical products that support delivery of care are potentially within scope.

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DfL Objectives

Savings
Switching to reusable alternatives for just three products across the NHS - scissors, forceps, and tourniquets - could generate between £5.3-10.6m per year.[2]

Growth
An economy-wide shift to circularity (all sectors, not just medtech) is estimated to bring £75bn to the UK economy and create half a million new jobs by 2030.[4]

Resilience and patient safety
During the COVID-19 Pandemic, 66% of Belgian companies who employed circular techniques experienced considerably less disruption than those that did not.[1]

Sustainability
Circular approaches will support delivery of a net-zero NHS. Reuse of medical devices as opposed to single use is associated with an average decarbonisation of 38-56% within their whole lifecycle.[3]

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1. https://www.ellenmacarthurfoundation.org/articles/building-resilience
3. https://www.bsms.ac.uk/_pdf/about/environmental-impact-nhs-devices-report-finalv2.pdf
2. Internal analysis - DHSC
4. Six-point plan for post-COVID growth | WRAP - The Waste and Resources Action Programme

POLICY BRIEF

Transition to reusable medical products in NHS hospitals: Current practice and challenges

August 2025

Findings

Rachel McLean, SusQI Programme Lead, Centre for Sustainable Healthcare

Project Team

Centre for Sustainable Healthcare (CSH)

- Dr Frances Mortimer, Medical Director
- David Cameron, Education Director
- Rosie Hillson, Sustainability Analyst
- Rachel McLean, SusQI Programme Lead

Brighton & Sussex Medical School (BSMS)

- Professor Mahmood Bhutta, Chair in ENT Surgery, Director of Green Healthcare Hub
- Professor Carrie Llewellyn, Professor of Applied Behavioural Medicine, Head of Department of Primary Care & Public Health
- Petar Tabakov, Research Fellow in Sustainable Healthcare
- Anya Robinson, Researcher

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Aims

- To quantify the benefits to NHS Trusts and Health Boards from transitioning to a reusable alternative compared to a single-use version for a selection of 'high-potential' products.

- To better understand difficulties faced when undergoing such a transition, what actions can be taken to enable transition despite these difficulties, and best practices.

Approach

1. CSH: Recruited 10 sites (4 working as a collaborative) and evaluated 6 different items (did not oversee full transition)
2. BSMS: 13 qualitative interviews to NHS sustainability, procurement and clinical staff, data analysed and sorted into themes.

Sites / participants recruitment via an expression of interest form

Items selected

Reusable at point of care

- Diathermy pad
- Blood pressure cuffs
- Patient warming devices

Reusable through sterile services / laundry

- Slide sheets
- Bronchoscopes
- Tray wrap

Outcomes explored

- Process and approach
- Barriers
- Patient experience or safety
- Staff experience
- Carbon emissions cost/saving
- Financial cost/saving

Sustainable value

Outcomes for patients and populations

Environmental + social + financial impacts

Participating sites

Process and Approach

- **Similar governance & approval requirements:**
  - Clinical, e.g., standard operating procedures, product identification/trial
  - Procurement, e.g., product identification, ordering, supplier engagement/contracts
  - IPC, especially for items reused at point of care
  - Sterile services / laundry
  - Finance sign off
  - Senior leadership/Board sign-off

- **Implementation Approaches Varied**
  - Governance/approval order, stakeholders, oversight/planning can range from one individual to structured product review groups
 - Trials, phased rollouts, trust wide implementation

Perceived barriers to the transition.

- **Lack of formal governance processes**
  - Inconsistent product usage across organisations
  - Steps and stakeholders for transition not always clear to those driving change
    - Key staff may be left out, e.g. porters
    - Huge number of stakeholders – requires a lot of back and forth.
  - **Change driven by motivated individuals** – vulnerable to losing momentum

- **Training & Communication challenges**
  - Limited training capacity
  - Training may not reach all staff → incorrect use & reduced confidence

- **Clinical Acceptability & Perceptions**
  - Specialty-specific variation in acceptance
  - **Conflicting guidelines and research (e.g. single use bronchoscopes).**
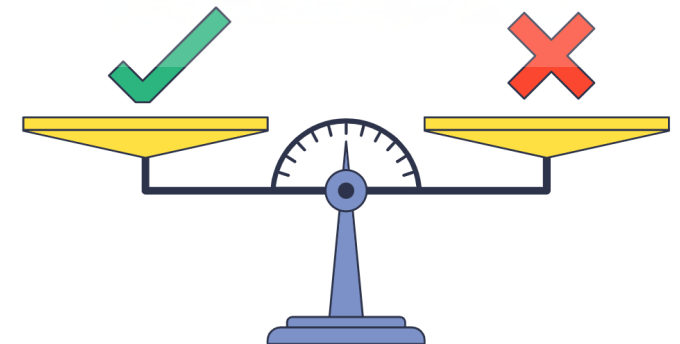
Perceived barriers to the transition.

- **Infrastructure, Capital Investment and costs**
    - Storage, compatibility and item tracking
    - Perceptions on suitability vary, e.g. tray wrap vs rigid containers
    - Capital costs (e.g., £240k washer)
    - Higher upfront costs, annual budget constraints
    - Savings lost if items underused, e.g. patient warming

- **Data & Carbon Accounting Gaps**
    - Few sites conduct carbon analysis at product level
        - Staff lack time, expertise and confidence
    - Lack of transparency or inconsistent data from suppliers
    - Conflicting guidelines and research
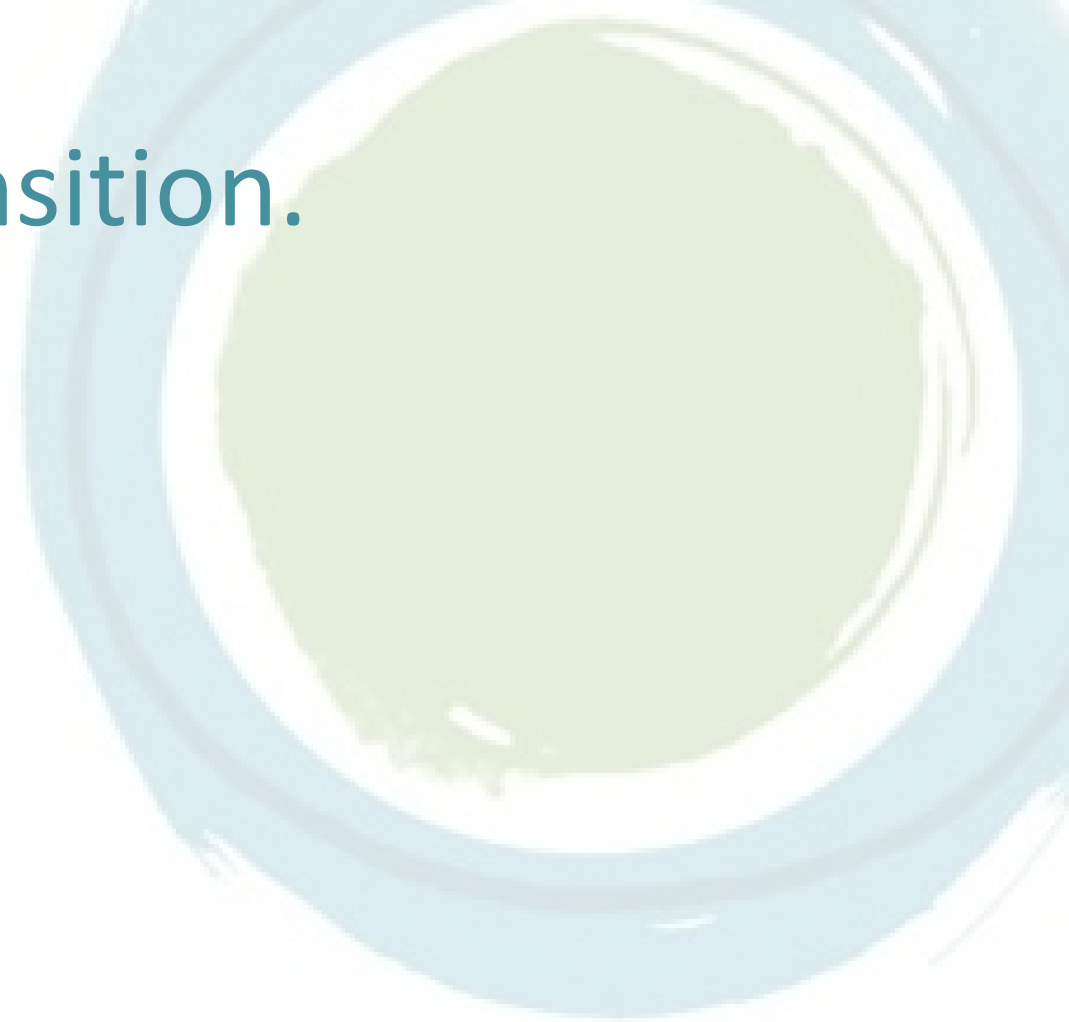
Perceived change to patient safety

- Risks due to training gaps/confidence, not products

- Improved clinical effectiveness
  - Bronchoscopes: increased functionality
  - Diathermy pads: reduce risks (though risk already low)

- Infection Prevention and Control (IPC)
  - In all cases, risk perceived to be extremely low with standards and processes agreed
  - IPC engaged and willing to explore change at all sites
  - IPC keen to see case study examples
  - IPC staff acknowledge there is variations in risk acceptance within own specialty.

Perceived change to patient and staff experience

Patients

- Often under anaesthesia
- When likely to be awake reusables look and perform like single use

Staff

- Positive experiences - ease of use, reliability, and environmental impact.
- Concerns
  - increased workloads, e.g. sterilisation, training
  - inefficiencies in current systems, e.g. sterilisation of unused equipment

All items saved CO2e
- 168 kgCO2e (bronchoscopes)
  - 495 miles driven
- 31.5 tonnes CO2e (reusable tray wrap)
  - 92,800 miles driven
- **However**: Risk of increasing CO2e in some circumstances, e.g. energy intensive washer
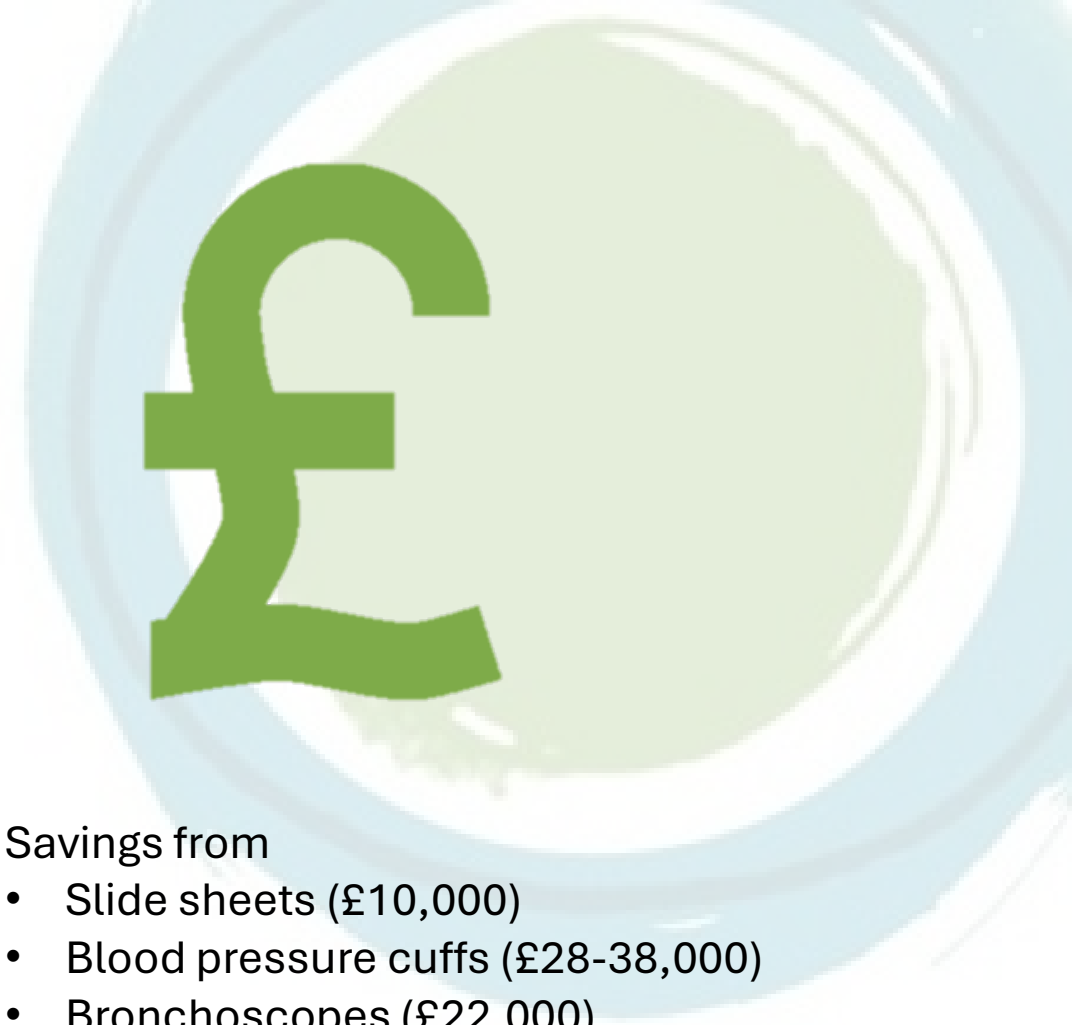
Savings from
- Slide sheets (£10,000)
- Blood pressure cuffs (£28-38,000)
- Bronchoscopes (£22,000)

Costs impact varied for diathermy, patient warming and tray wrap.

CO2e and £ impact dependent on many local factors

Patient Warming Devices

NHS Northampton General Hospital — NHS Trust

Aim: Compare single use 'Bair Huggers', with reusable 'Hot Dogs'

Context: Using Bair Hugger for many years. 6x Hot Dogs purchased in 23/24 financial year. Training for use and cleaning guidance awas provided.

Challenges:

- Audit found a decline in core body temperature for patients who had a Hot Dog.
- Improper usage, such as only placing them under patients (instead of above and below)
- Confidence of staff

Impacts:

- Clinical audit confirmed patients are being adequately warmed despite mixed usage.
- Reusable option reduced background noise in theatre.

- 3,515 kgCO2e, equivalent to driving 22,437 miles in an average car

- Main theatres: £10,276 saved. All theatres: £8,926 cost

- Staff survey (47 responses): 38% preference for Hot Dogs. 13% preference for Bair Huggers.
- Staff saw lots of advantages (more comfortable for patients, patient can be warmed earlier), reduced noise pollution, easier workflow)
- But also saw disadvantages (staff training, some patient safety concerns, cleaning time, unfamiliarity with equipment)

Change driven by motivated individuals
"Surgeons are really the ones driving it forward because they are the ones on the front line using these products. They understand limitations there might be and barriers they need to get over."
Participant 8, Head of Sustainability

Lack of Clarity in Transition Processes
It's a very, very slow progress and it can be quite frustrating and disheartening"
Participant 8, Head of Sustainability

Limited organisational awareness and engagement
"I find it sad that that our leaders in the Trust aren't dictating more."
Participant 12, Sustainability Programme Manager

Competing priorities and staff capacity limit adoption
"There's all sorts of competing priorities, and I would say everybody pretty much everyone in the Trust is willing, but logistically, making it happen in practical terms [is different]" Participant 11, Contracts and Procurement Manager

Financial and procurement challenges
"We're locked into this this unhelpful 12-month finance cycle" Participant 11, Contracts and Procurement Manager

Infrastructure, training and monitoring challenges
"We're going to have a situation where we have disposables and reusables in parallel while we build up the logistics to get more reusable surgical gowns in"
Participant 3, Sustainability Project Manager

Infrastructure Challenges
"We've got a lot of limitations on space and capacity across our sites. So that is that is an issue." Participant 4, Sustainability Manager

Key Insights

- Leadership and governance structures absent
- Operational and infrastructure challenges restrict adoption
- Procurement systems fragmented
- Staff awareness and training limited
- Infection Prevention and Control (IPC) concerns can stop adoption

- Staff and patient experience is variable
- There is no central depository of evidence
- Financial concerns can be barriers to adoption
- Carbon accounting is uncertain
- Case studies and networks can support transition
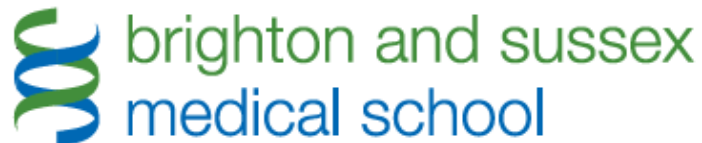
Positive takeaways

- Despite all the challenges – **change is happening.**
  - But **people** can be better supported for faster, consistent transitions

- **There is willingness to transition -** Many staff report good usability, reliability, and are motivated by the environmental impact of sustainable alternatives.

- **Clinical effectiveness can be improved** - Products like bronchoscopes and diathermy pads offer enhanced functionality and safety benefits – Aligning with core NHS priorities, e.g., safety, quality, and value

- While there is local variation – there is strong support that **reuse lowers environmental impact**

Recommendations
for Policy makers and Government

1
Strengthen System-Level Leadership, Governance and Infrastructure

2
Provide a Structured Framework for Planning and Implementation

3
Address Knowledge Gaps and Build the Evidence Base

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1 Strengthen System-Level Leadership & Governance

- Centralised national guidance & policy for scale & speed of change needed

- Shared prioritisation frameworks: high volume, high cost, and direct benefits

- Exploration of
  - existing infrastructure for decontamination & modelling future needs
  - financial investment & funding mechanisms required

- Accountability mechanism with realistic timeframes, such as 'comply or explain'

2 Provide a Structured Implementation Framework

- Standardised implementation framework: central coordination, local flexibility
  - Clear roles, responsibilities & wide stakeholder engagement
  - Key decision points
  - Sequenced steps for transition
  - Risk management
- Align with existing change management structures, e.g., product review mechanisms, Quality Improvement
- Time and training built into roles
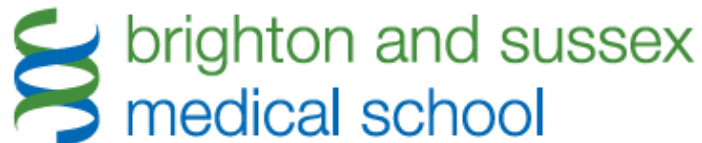
3 Address Knowledge Gaps & Build the Evidence Base

- Share case studies: successes and challenges
- Capture full value: clinical, carbon, financial, social (patient / staff)
- Raise the credibility of local QI evidence
- Promote cross-organisational learning through local, regional and national networks
- Don't confine to sustainability forums – use clinical, procurement, operational, etc.
- Align with core NHS priorities, e.g., safety, quality, and value.
- Patient role in change needs further consideration

Resources

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The **Community**

An inclusive community of healthcare professionals, patients, researchers, students and more.

SCAN ME

29+ specialty and discipline specific networks

Carbon Footprinting for Healthcare

Mental Health Sustainability Network

Allied Health Professions Sustainability Network

Green Space for Health

Primary Care Sustainability Network

Nursing Sustainability Network

sustainablehealthcare.org.uk   @sushealthcare

More About SusQI

What is SusQI?

The SusQI Education Project

Meet the Team

Helping you to Use SusQI

Step by Step Guide

Join the SusQI Academy

Green Team Competition

Helping you Teach SusQI

SusQI Course

Teach SusQI Resources

Teach SusQI Course

Join the SusQI Network

Become a Beacon Site

CSH Networks

SusQI Projects

Our Programmes

Equip healthcare professionals and organisations with methods and metrics for sustainable models of care.

Sustainability in Quality Improvement (SusQI)

Green Team Competition

Sustainability Impact Analysis

Green Space for Health

Education & Training

Sustainable Specialties

sustainablehealthcare.org.uk

@sushealthcare

The DfL Roadmap

Design for Life
Roadmap

Building a circular economy for medical technology

Design for Life has been designed with a collaborative of over 80 stakeholders from across the **medtech industry, health family**, and **academia.**

designforlife@dhsc.gov.uk

Leadership & Alignment
Unclear direction and misaligned strategies across the value chain leads to inconsistencies, inefficiencies, and inertia, hindering meaningful, coordinated progress.

Behavioural Change
The medtech landscape is one in which linear products are the default choice, maintained by a lack of value placed on circular systems and limited support for change.

Commercial Incentivisation
Stakeholders are insufficiently incentivised, or in some instances are disincentivised to choose and deliver circular solutions.

Regulations & Standards
UK regulatory regimes and technical standards predate circularity and have potential to further enable the medtech sector to recognise opportunities and align internationally.

Physical & Digital Infrastructure
Existing physical and digital infrastructure and supporting services hold back the scaling of circular solutions, both locally and nationally.

Transformative Innovation
The innovation ecosystem is not tailored to circular objectives, leading to impeding solution developments.

DESIGN FOR LIFE

WHAT IS THE DESIGN FOR LIFE PROGRAMME?

The Design for Life (DfL) programme is an initiative of the Department for Health and Social Care dedicated to delivery of a circular approach to medtech.

Its vision is that, by 2045, the UK will have transitioned away from all avoidable single-use medtech products towards a functioning circular system that maximises reuse, remanufacture, and recycling. The intention is that this will safely transform the sector to deliver enhanced resilience, increased economic growth, better value for patients and the NHS, and minimised environmental impacts.

The programme is a collaborative effort between government, industry, the health and care system, and academia, with over 80 stakeholders involved to date.

Department of Health & Social Care

Thank you