



A more sustainable critical care

The County Durham and Darlington NHS Foundation Trust's 360-sustainability assessment showcases how critical care can reduce its environmental impact.

January 2023

Executive summary

County Durham and Darlington NHS Foundation Trust (CDDFT) partnered with Philips to undergo a 360-sustainability assessment, and to reduce the environmental impact in its Intensive Care Unit.

Strategically chosen as a focus area, critical care is a high consumer of electricity and single-use items and is one of the most expensive types of care. Collaborative efforts identified opportunities to reduce the carbon footprint and material waste across patient care pathways and staff workflows. The Trust achieved over 95% compliance with the National Health Service's net zero education module and implemented several initiatives, some of which include:

- Daily sustainability reminders
- Pharmaceutical reviews – ensuring drugs prescribed are still required and, if so, assessing if they can be given via the enteral rather than intravenous route to reduce waste
- Only opening equipment when needed to prevent unnecessary waste
- Ensuring PPE use is appropriate to each patient
- Actively de-medicalizing patients as their health improves, reducing and removing monitoring when clinically indicated

About the customer

County Durham and Darlington NHS Foundation Trust aims to provide safe, compassionate, and joined-up care to a population of 650,000. It is one of the largest Trusts in the United Kingdom geographically, and the largest in the region. With more than 7,500 colleagues working across hospitals and community settings, the Trust is committed to placing people and communities at the heart of all that it does, from acute care in hospitals to essential support community settings and patients' homes.



The challenge

Healthcare's environmental footprint is a global problem. Many organizations are recognizing that they need to take urgent steps to reduce their impact, while planning how to provide holistic care in the future.

In the UK, it's reported that the National Health Service (NHS) accounts for 4% of the UK's carbon dioxide (CO₂) emissions and is responsible for around 20 million tons of CO₂ emissions annually.^{4,5} It is undergoing a journey to be the world's first net zero health service, with a target of reaching net zero by 2040 for emissions it controls directly and 2045 for emissions it can influence.

But the NHS can't do this alone, especially as 62% of emissions are identified as 'Scope 3' (indirect). To succeed, there must be significant collaboration across the public and private sectors, including suppliers and partners. CDDFT understands that a sustainable future for the Trust and the wider NHS will be one that embraces partnerships and innovation, and identifies ways of driving the highest quality clinical care through environmental improvements.

Philips was the first private-sector organization to approach CDDFT, offer a collaborative hand, and support its aims to become an exemplary Trust for environmental sustainability in human healthcare.

We share a common purpose: to enable sustainable high-quality healthcare that improves, maintains, or restores health, is affordable to all now and in the future, while minimizing negative impacts on the environment.

Approach

County Durham and Darlington NHS Foundation Trust is one of the largest integrated care providers in England, employing over 7,000 members of staff and serving a population of over 650,000 people.

The Trust recognizes that it has a key role to play in reducing its carbon emissions and, as an anchor institution, supporting the local community in adapting

to climate change. Today, it's still in the early stages of its sustainability journey.

"Working with Philips, who also has a strong interest and footing in sustainability, has complemented our efforts and opened our eyes to other key focus areas," said Sue Jacques, Chief Executive, County Durham and Darlington NHS Foundation Trust. "The team that we worked with are a credit to the business – amazing individuals, who were focused, hard-working and engaging, with unbounded enthusiasm."

The solution

'Greening critical care' is a joint response between the Trust and Philips. Through the Trust's existing Managed Service strategic partnership in radiology, Philips suggested a holistic analysis of the existing care environment with a focus on material and waste management.

The aim of the program was to identify critical opportunities to reduce carbon emissions and material waste across patient care pathways and staff workflows.

Critical care was strategically chosen as a focus area as per patient, it is a high consumer of electricity and single use items and is one of the most expensive types of care. The program fosters sustainable optimization across all aspects of critical care: clinical process, supply chain, technology, and healthcare environments.

"There was an early realization that we shared the same understanding about what collaboration really means, as with climate change, we either all cross the line together or no one crosses it at all," said Dr Richard Hixson, Consultant in Anesthesia and Critical Care Medicine at County Durham and Darlington NHS Foundation Trust.

Consultants with environmental and clinical expertise from the Philips team applied a 360-degree methodology, including extensive data analysis and observation, as well as discussions with medical and administrative staff in the ICU. This took place over a six-month period.

Sustainable healthcare challenges in the UK



£1,621

per bed, per day: UK critical care is expensive¹



125kg CO₂

emissions per bed, per day:
UK acute care CO₂ footprint makes up 56% of the NHS footprint, with critical care being a part of this²



+9%

demand for critical care:
Unlike most other categories of hospital beds in the NHS, the total number of critical care beds has increased³

¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7045184/>

² [https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196\(20\)30271-0.pdf](https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196(20)30271-0.pdf)

³ <https://www.kingsfund.org.uk/publications/nhs-hospital-bed-numbers>

⁴ <https://www.england.nhs.uk/greenernhs/national-ambition/>

⁵ <https://www.kingsfund.org.uk/projects/time-think-differently/trends-sustainable-services>

In addition, the Philips team interviewed stakeholders from areas such as clinical services (nurses, physicians, physiotherapists, rehabilitation specialists), facilities, waste and sustainability management, as well as procurement, supply chain and real estate.

In partnership with staff at CDDFT, Philips consultants analyzed current state data, made on-site field visits for key stakeholder interviews, and held shadowing and observation sessions in the areas of clinical workflow, supply chain and procurement, medical technology, and experience design.

Hixson said that the team from Philips took a holistic approach.

“They didn’t just come in and say, ‘let’s talk carbon’, they were open to discuss our interests too,” Hixson said.

Because of the collaboration, Hixson and the Trust recommended that Philips sign the ambition statement for the Aspen Institute’s Cargo Owners for Zero Emission Vessels (coZEV), sending a signal of urgency across industries to accelerate decarbonization of the maritime value chain.

“There was an early realization that we shared the same understanding about what collaboration really means, as with climate change, we either all cross the line together or no one crosses it at all.”

Dr Richard Hixson

Consultant in Anesthesia and Critical Care Medicine at County Durham and Darlington NHS Foundation Trust

“Philips was the first healthcare supplier organization to sign, and we hope it will pave the way for others,” Hixson said.

The experienced Philips consultants went through an extensive fact-finding exercise, using proven data visualization tools to analyze the information, exploring the following areas:

- Clinical process – patient flow in, flow-through and flow out of the ICU and the impact this had on carbon and materials consumption.
- Supply chain – ways to reduce waste and CO₂ impact from single use items.
- Staff experience – ways to improve staff engagement in the topic of sustainability.
- Medical technology – ways to reduce power, as well as utilize central integration and Artificial Intelligence (AI).
- Spatial – ways to optimize space, adapt existing building stock and climate management.



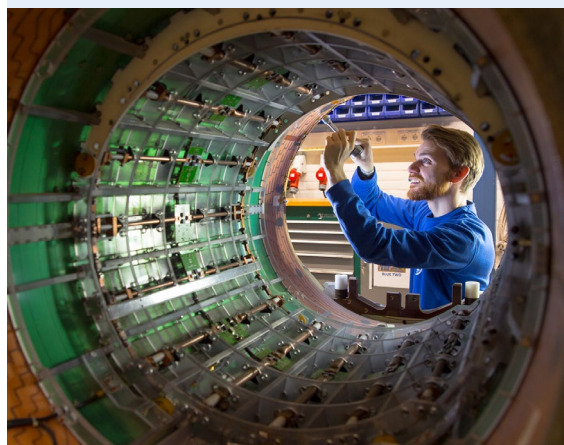
Outcomes and results

The team then produced a detailed report, highlighting key sustainability opportunity areas and recommendations for targeted improvements, which will now serve as a blueprint for further change. These were showcased at a joint workshop event, with a particular focus on medical equipment, estates and facilities, clinical operations, and supply chain. The following areas were outlined, alongside specific key performance indicators (KPIs) to measure:

- **ICU discharge optimization:** including resolving bottlenecks, optimizing staff capacity planning, reducing resources that patients do not require when getting ready for discharge, and reuse of consumables. Example KPIs: patient outcomes realized per CO₂ emissions produced, total CO₂ emissions produced per year.
- **Reducing waste in the supply chain:** including reducing the CO₂ and waste volume impact associated with single use items; saving costs by using less and moving to reusable equipment where possible. Example KPIs: number of projects / improvement cycles conducted, percentage of consumables re-used in ICU and total volume of consumables used.
- **Staff experience:** driving cultural change by training staff on the latest sustainability requirements, identifying sustainability ambassadors, enabling staff to share ideas, measuring success, and recognizing staff for their efforts. Example KPIs: number of staff trained on sustainability, number of sustainability projects initiated by staff.
- **Medical technology:** reducing excessive noise in the ICU from patient alarms, as well as power reduction and effective management of assets. Example KPIs: reduction in measurable power waste.
- **Strategic refurbishment masterplan:** reducing CO₂ emissions by appraising the existing building stock and exploring ways to retain and adapt. Example KPIs: extending lifespan of existing buildings, reduction of costs and CO₂ emissions.

Partnering with Philips to drive sustainable and equitable healthcare:

- Since 2020, we have been carbon neutral in our operations (scope 1 and 2).
- We have ambitious targets to decarbonize the value chain. Teaming up with suppliers and customers has a potential sevenfold impact compared with only reducing CO₂ emissions from our own operations.
- As an advocate for globally aligned [green purchasing criteria](#), we consider sustainable procurement one of the critical strategies that care providers and governments can adopt.
- Circularity can drive a lower material footprint per patient, creating the opportunity to reduce costs, emissions and waste, while improving healthcare efficiency. By 2025, we aim to design all new product introductions in line with our EcoDesign requirements.



During the workshop, stakeholders from Philips and CDDFT discussed the importance of the findings and demonstrated a commitment to driving them forward. The Trust is already implementing some of the recommended initiatives, including:

- Sustainability reminders in the daily ICU huddle
- Environmental impact assessment line in daily reviews led by Dr Richard Hixson
- Pharmaceutical reviews – ensuring drugs prescribed are still required and when they are, assessing whether they can be given via the enteral rather than the intravenous route to reduce waste
- Only opening equipment when needed to prevent unnecessary waste
- Ensuring PPE use is appropriate to each patient, not a blanket policy
- Actively de-medicalizing patients as their health improves, reducing frequency of monitoring and removing monitoring when clinically indicated
- Sustainability included in Quality Improvement projects

In addition, CDDFT has achieved over 95% compliance with the National Health Service's net zero education module. The team is now planning to measure the impact of the interventions made.

The report-out session included key team members along with senior management. Commitments were made to drive key changes and ensure they move forward.

"It was very helpful to be doing a piece of work that was structured in a different way to what we've done before, and it was a real delight for the teams that were working with Philips," Jacques said. "The relationship with Philips is going to be important for the next phase of our sustainability work and it's great to have such a trusting, productive and innovative partnership."

Healthcare in the UK has made progress towards becoming more sustainable and less carbon-intensive,

Over six months, consultants with environmental and clinical expertise from the Philips team applied a 360-degree methodology, including extensive data analysis, observation, and interviews with stakeholders from across clinical services and hospital operations.

said Aylin Groenewoud, Senior Experience Lead Sustainability at Philips, who led the study. Philips is keen to support other Trusts in identifying critical sustainability patient and staff experience touchpoints, and improvement and optimization opportunities, to reduce carbon emissions and material waste.

"Working with the team at County Durham and Darlington NHS Trust was a fantastic opportunity to not only support them with their sustainability goals, but also pilot a new proposition for Philips, which we are now excited to take to market," Groenewoud said.

Hixson, who was the planetary health lead at the Trust at the time, called the outcomes 'enlightening.'

"We knew there were going to be areas to address, but Philips took time to undertake quantitative analysis which validated our suspicions and provided outputs we could present back to the wider Trust," Hixson said. "For me, I believe the quality of care we provide on the unit has improved because of the work, as well as through the direct way we serve certain groups of patients. For example, by looking at patient flow and de-medicalization of patients, we are helping to ease demand on critical care by adjusting medication, removing monitoring that is no longer required and moving patients onto new pathways, in a positive way."

