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Future-Proofing Healthcare: How Technology Can Deliver a Healthier, More Sustainable Future

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Why Sustainability Matters to the National Health Service

Sustainability is no longer just a policy requirement, it is a fundamental shift in how the National Health Service (NHS) delivers high quality care, manages costs, and builds resilience. As one of the U.K.'s largest public institutions, the NHS has a significant environmental impact, contributing nearly 4% of England's total carbon footprint[1]. With healthcare demand rising and financial pressures mounting, today sustainability is more than an ethical obligation, it is also an operational attribute, necessary to move towards more effective and efficient care models. To this end, the NHS has set ambitious decarbonisation targets, aiming to be the world's first net-zero health system, making sustainability a core pillar of future-proofing its operations.

AT A GLANCE

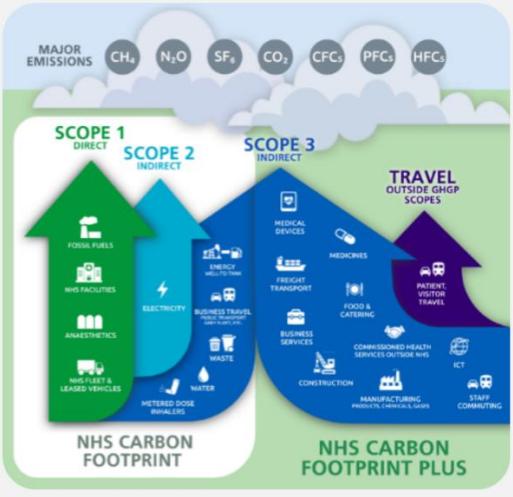
KEY STATS

- The NHS accounts for about 4% of England's total carbon footprint.
- NHS facilities account for 15% of its carbon footprint, whereas 62% stems from supply chain activities.
- Two-thirds of European healthcare organizations are investing in network-enabled smart hospital capabilities.
- £259 million smart hospital NHS investments are expected to deliver annual net savings of £120 million and CO2 emission reduction of 2.3%.

FIGURE 1: THE NHS NET-ZERO TARGETS

Greenhouse Gas Protocol (GHGP) scopes in the context of the NHS

- **Direct Emissions (NHS Carbon Footprint): Net Zero by 2040** for emissions directly under NHS control, such as energy use in buildings and NHS-owned vehicles.
- **Supply Chain and Indirect Emissions (NHS Carbon Footprint Plus): Net Zero by 2045** for emissions influenced by the NHS, including those from suppliers, products, and outsourced services.



Source: NHS, July 2022

[1] NHS England, Delivering a 'Net Zero' National Health Service, October 2020, updated in July 2022 (https://www.england.nhs.uk/greenernhs/publication/delivering-a-net-zero-national-health-service/)

Key Drivers for an NHS Organisation's Sustainability Strategy

Regulatory Compliance

Policies such as the NHS Net Zero Supplier Roadmap[2] and the Health and Care Act 2022[3] have embedded sustainability into NHS governance. By 2027, all NHS suppliers must provide carbon footprint data and reduction plans, creating a clear regulatory imperative for transparency and sustainability across the supply chain.

Efficiency & Cost Reduction

Rising energy costs are an increasing burden, with £1 in every £187 of NHS spending allocated to building energy use[4]. According to the 2024 "Lord Darzi's report,"[5] public sector decarbonisation projects are estimated to reduce NHS energy bills by £260 million annually, while cutting 3 million tonnes of CO_2, emissions. Investing in energy-efficient buildings, as well as in low-carbon digital infrastructure, offers tangible financial returns while reducing operational waste.

Impact on Patient Outcomes

The climate emergency is fundamentally a health emergency. Environmental factors such as air pollution and extreme weather directly impact public health, while inefficient hospital environments affect care quality and patient outcomes. Smart, energy-efficient hospitals deliver multiple benefits: reduced infection rates through better ventilation, improved indoor air quality, and enhanced healing environments that support faster patient recovery. By strategically leveraging digital tools and predictive analytics, NHS trusts can simultaneously address both clinical and environmental challenges, creating a virtuous cycle where sustainability initiatives directly contribute to better patient care.

Why Chief Information Officers Should Care About Sustainability

For NHS chief information officers (CIOs), sustainability represents an opportunity to build a smarter, more efficient, and patient-centric healthcare system. As the NHS accelerates its journey toward net-zero, CIOs are at the forefront, leveraging digital transformation to cut emissions, reduce operational costs, and enhance care delivery. The NHS England's Estates 'Net Zero' Carbon Delivery Plan[6] demonstrates that investing £1 million in initiatives such as energy efficiency improvements and smart energy systems can result in annual carbon savings of 1.33 $ktCO_2e$ with a cost recovery period of just 3.8 years.

[2] NHS England, NHS Net Zero Supplier Roadmap, September 2021 (https://www.england.nhs.uk/greenernhs/get-involved/suppliers/ and https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2024/04/NHS-Net-Zero-Supplier-Roadmap-2024.pdf)
[3] Health and Care Act 2022, April 2022 (https://www.legislation.gov.uk/ukpga/2022/31/contents)
[4] James Paget University Hospitals NHS Foundation Trust, Estates 'Net Zero' Carbon Delivery Plan, August 2021 (https://www.jpaget.nhs.uk/media/588250/Estates-Net-Zero-Carbon-Delivery-Plan.pdf)
[5] Department of Health and Social Care, Independent investigation of the NHS in England, September 2024 (https://www.gov.uk/government/publications/independent-investigation-of-the-nhs-in-england)
[6] NHS England, Greening the business case, May 2023 (https://www.england.nhs.uk/long-read/greening-the-business-case/) and James Paget University Hospitals NHS Foundation Trust, Estates 'Net Zero' Carbon Delivery Plan, August 2021 (https://www.jpaget.nhs.uk/media/588250/Estates-Net-Zero-Carbon-Delivery-Plan.pdf)

How CIOs Can Drive Impact

Sustainable IT Infrastructure

Digital systems, datacentres, and networks consume vast amounts of energy, often running on outdated hardware. IDC's research[7] shows that over 85% of healthcare organisations are already prioritising energy-efficient cloud migration to reduce Scope 2 emissions while improving IT resilience. NHS CIOs can lead this transition to low-carbon computing, leveraging cloud-based data processing to significantly reduce the organisation's carbon footprint.

New Care Models and Smart Healthcare Facilities

Achieving impactful decarbonisation requires extending digital transformation beyond data centres and into physical healthcare infrastructure and new care delivery models. Smart hospitals and connected healthcare are emerging as the foundation of energy-efficient and sustainable care delivery. Healthcare sustainability also depends on developing less carbon-intensive approaches to delivering high-quality patient care.

For outpatient services, AI-powered diagnostics, virtual wards, and remote monitoring simultaneously reduce emissions from hospital visits and travel while enhancing care accessibility and efficiency. NHS CIOs can advance sustainability objectives by modernising infrastructure to support digital-first care models that reduce environmental impact and improve patient outcomes.

According to IDC research[8], more than two-thirds of European healthcare organisations are investing in network-enabled smart hospital capabilities. These advanced networks serve as the backbone of these intelligent systems, enabling hospitals to adapt to internal policies and external conditions while optimising performance and reducing patient risks through:

- **Future-ready networks** acting as the hospital's critical nervous system, connecting thousands of IoT sensors and controllers to power intelligent building management and real-time data processing.
- **AI-driven automation** leveraging the network to optimise energy use by dynamically adjusting HVAC, lighting, and power distribution based on occupancy, weather, and clinical needs.
- **Remote monitoring technologies** utilising secure, resilient network connections to deliver real-time insights on air quality, space utilisation, equipment performance, and real-time carbon tracking, helping facilities teams identify inefficiencies and drive improvements.

This interconnected ecosystem turns static infrastructure into responsive environments, reducing energy waste while enhancing clinical effectiveness — all enabled by enterprise-grade network architecture designed for healthcare's specific needs. A real-world example from Imperial College Healthcare NHS Trust shows how automated power management software led to annual savings of £440,000 and a reduction of 590 tonnes in carbon emissions by automatically shutting down

[7] IDC *Sustainable IT Infrastructure Survey*, August 2023, n=122, 82
[8] IDC *Worldwide Digital Transformation Use Case Taxonomy, 2024: Smart, Sustainable Cities and Communities* (IDC #US52501324, August 2024)

idle computers overnight[9]. This example highlights the need for advanced networks and real-time carbon-tracking tools, allowing NHS CIOs to monitor, measure, and support data-driven sustainability improvements across healthcare infrastructure.

Monitoring Organisational Impact

CIOs play a crucial role in sustainability reporting and compliance. By 2027, the NHS Net Zero Supplier Roadmap mandates emissions disclosure, requiring greater transparency in carbon tracking. Without automated solutions, NHS Trusts risk failing to meet reporting obligations. CIOs need to:

- Implement systems that monitor IT-related emissions in real time
- Leverage network analytics to aggregate data on resource usage
- Assess supplier carbon footprints as part of procurement
- Deploy dashboards that visualise sustainability progress

For example, according to BT's data, its future-ready networks and digital sustainability monitoring tools enable customers to reduce CO2 emissions by an average of 15%.

With the NHS's 80% emissions reduction milestone approaching in 2028–2032, organisations must establish baseline emissons, reinforcing the principle that "you cannot reduce what you cannot measure." By adopting low-carbon IT strategies, leveraging intelligent automation, and ensuring regulatory compliance, CIOs position themselves as strategic leaders in healthcare transformation — demonstrating that IT investments are not a cost burden but a strategic enabler of net-zero healthcare.

Benefits of Sustainable Practices for the NHS

Evidence shows that sustainable practices[10] in healthcare effectively reduce emissions while delivering operational savings and maintaining care quality. Within the NHS, energy-saving strategies like overnight ventilation shutdowns in high-energy areas like operating rooms present significant cost-saving potential. These focused energy-saving measures can amplify broader decarbonisation efforts. Intelligent, real-time energy monitoring is projected to contribute up to 2.3% of the NHS's required carbon reduction targets. With upfront investments, these systems are expected to pay for themselves within two years, yielding net annual savings of £120 million by 2034[1]. With the support of advanced network solutions, these digital tools are projected to improve energy efficiency across NHS facilities. These technologies provide greater visibility into emissions data and operational inefficiencies, empowering trusts to prioritise decarbonisation initiatives effectively. Transparent data reporting, a cornerstone of the NHS Net Zero Supplier Roadmap, ensures suppliers meet mandatory requirements for carbon footprint disclosures and carbon reduction plans (CRPs), driving accountability across the supply chain. As the NHS transitions to digital-first systems and migrates on-premises infrastructure to the cloud, it will lower energy consumption from legacy hardware and reduce embodied emissions across the

[9] NHS England, Digital solution to reduce computer energy use at Imperial College Healthcare NHS Trust, 2024 (https://www.england.nhs.uk/greenernhs/whats-already-happening/digital-solution-to-reduce-computer-energy-use/)

[10] including use of renewable energy, green IT procurement, sustainable lifecycle management of devices and hardware, and energy-efficient facility refurbishment and design

supply chain. By adopting cloud technologies and scalable IT systems, the NHS reduces its operational footprint and enhances resilience against future challenges. In addition, by aligning IT investments with sustainability goals, the NHS strengthens both financial stability and operational efficiency, creating a pathway to deliver high-quality, sustainable healthcare while advancing its net-zero targets.

How BT Can Support NHS CIOs in Advancing Sustainable Digital Transformation

BT provides comprehensive digital sustainability solutions that enable NHS CIOs to reduce carbon emissions, optimise IT efficiency, and ensure compliance with net-zero mandates. By integrating low-carbon networking, cloud-based IT infrastructure, and real-time emissions tracking, BT allows NHS organisations to align digital investments with sustainability objectives while enhancing operational resilience and financial performance. As NHS Trusts face growing pressure to reduce their environmental impact, digital transformation should be seen as a strategic enabler. A significant portion of NHS carbon emissions (and operational costs) comes from energy-intensive on-premises IT, outdated networks, and inefficient data processing. **BT's Health Cloud Services** allow Trusts to **transition to energy-efficient cloud environments**, reducing scope 2 and 3 emissions while improving IT resilience. Cloud migration helps NHS organisations **minimise reliance on high-carbon infrastructure**, improving operational efficiency while enabling greater scalability and security. Additionally, **BT's low-carbon networking solutions**, powered by 100% renewable electricity, help NHS Trusts lower the environmental footprint of their datacentres and IT operations, ensuring that digital infrastructure meets sustainability targets without compromising performance.

Beyond IT infrastructure, hospital estates contribute over 15% of NHS carbon emissions[1], making energy-efficient buildings and smart hospital solutions critical to achieving net-zero objectives. **BT's network-integrated smart building solutions** provide real-time monitoring of air quality, occupancy, and energy consumption, allowing Trusts to implement automated adjustments to heating, ventilation, and lighting. Through integration with Cisco Spaces and Johnson Controls OpenBlue, NHS Trusts can optimise hospital operations and reduce unnecessary energy use, ensuring that buildings are only using energy when and where it is needed, without impacting patient care quality.

The NHS Net Zero Supplier Roadmap[2] mandates carbon footprint disclosure by 2027, requiring NHS Trusts to enhance emissions tracking and reporting for regulatory compliance. However, many NHS organisations lack the tools to measure digital emissions in real time, hindering their ability to demonstrate progress. **BT's Carbon Network Dashboard** provides real-time insights into IT energy consumption, allowing CIOs to track emissions and prioritise the replacement of high-carbon assets. Meanwhile, the **Digital Carbon Calculator** helps NHS organisations track scope 2 and 3 emissions from IT infrastructure, supporting data-driven procurement decisions and sustainability reporting. These tools help improving NHS-wide carbon transparency, ensuring Trusts can effectively measure, manage, and mitigate their environmental impact.

The NHS Net Zero Strategy emphasises financial accountability, requiring CIOs to justify digital sustainability investments also through ROI. Therefore, sustainability investments should deliver measurable cost savings. By integrating AI-driven energy optimisation, cloud-based IT models, and real-time emissions tracking, BT aims to enable NHS Trusts to lower energy consumption, reduce IT-related emissions, and improve financial resilience. CIOs who embed low-carbon IT strategies and sustainability compliance measures into digital transformation efforts will ensure their organisations are both financially and environmentally sustainable in the long term.

Challenges

Many sustainability initiatives are already underway across various NHS organisations[11], but the NHS still faces several key challenges in reaching its net-zero targets, which CIOs must navigate. These include:

Budget Constraints and Spend Controls

Limited budgets and high upfront costs restrict investment in long-term decarbonisation projects despite their potential for cost savings. The NHS Net Zero Strategy emphasises local spend controls on technology, requiring CIOs to provide concrete evidence of energy efficiencies and cost reductions to secure funding for IT modernisation.

The use of real-time energy monitoring, sustainability dashboards, and financial modelling tools can help build a strong business case for continued investment in low-carbon digital infrastructure.

Legacy IT Infrastructure and Slow Modernisation

Many NHS Trusts operate on aging IT systems and outdated network infrastructure that contribute to higher energy consumption and operational costs. The shift to cloud-based, energy-efficient IT models is essential but challenging, due to capital requirements and integration complexities. Upgrading to advanced modern network infrastructure helps NHS facilities optimise power, implement AI driven automation, and reduce emissions, but limited funding slows progress. Additionally, workforce engagement is low, with limited sustainability training and inadequate leadership involvement in digital transformation initiatives. IDC research identifies the lack of senior support as a key barrier to adopting sustainable IT infrastructure[12].To embed sustainability in the NHS culture, universities and professional training programs must integrate sustainability principles into IT and estate management curricula, preparing future NHS leaders to drive digital decarbonisation efforts.

Compliance and Reporting Obligations

New sustainability mandates require NHS Trusts to track, report, and verify carbon emissions. The NHS Net Zero Supplier Roadmap requires all suppliers to disclose their carbon footprint by 2027, making carbon transparency a procurement priority. Without automated carbon tracking tools, Trusts may struggle to meet these obligations. CIOs must integrate emissions monitoring directly into IT systems to align investments with carbon reduction goals, leveraging tools such as sustainability dashboards and network-based carbon tracking solutions. By incorporating

[11] NHS England, System progress, 2024 (https://www.england.nhs.uk/greenernhs/whats-already-happening/)
[12] IDC Sustainable IT Infrastructure Survey, August 2023 n=122

sustainability metrics into financial planning and procurement, NHS Trusts can align IT investments with carbon reduction goals, ensuring regulatory compliance and measurable progress toward sustainability targets.

Futureproofing the NHS: Actionable Steps for a Sustainable, Resilient Healthcare System

For NHS CIOs, the shift toward sustainable digital infrastructure represents an opportunity to future-proof operations, reduce costs, and enhance the strategic value of IT infrastructure to the organisation. Rather than being another financial burden on already constrained budgets, investments in low-carbon, energy-efficient networks generate measurable returns by reducing operational expenditure, avoiding future compliance penalties, and optimising resource allocation. These investments pay for themselves through decreased energy consumption, lower maintenance costs, and extended equipment lifecycles — transforming what might be seen as "green spending" into strategic financial stewardship that simultaneously enables improved clinical outcomes and operational efficiency. By reframing sustainability as an investment rather than a cost, CIOs can lead initiatives that strengthen the organisation's core objectives while advancing its environmental goals.

Modern network infrastructure plays a crucial role in decarbonisation efforts. By transitioning to cloud-first IT strategies, energy-efficient networking, and real-time carbon tracking tools, NHS Trusts can significantly reduce energy waste while optimising IT resources. BT's solutions demonstrate how low-carbon networking can cut emissions while improving performance, ensuring every digital investment aligns with both sustainability and operational objectives.

Investing in energy-efficient IT infrastructure and advanced networks boosts cost efficiency. As energy costs rise and the Net Zero Strategy requires financial accountability, AI-driven workload management, real-time power monitoring, and network automation can help Trusts optimise IT consumption, reduce expenses, and demonstrate ROI on sustainability initiatives.

With the NHS's direct carbon 80% emissions reduction target for 2028-2032 approaching rapidly, CIOs have a critical window of opportunity to lead the digital sustainability transition. The ability to reduce carbon emissions, optimise IT spend, and improve operational efficiency depends on taking decisive steps today. By embedding low-carbon IT strategies, implementing intelligent automation, and ensuring compliance with NHS sustainability mandates, NHS CIOs can be strategic leaders in healthcare transformation.

The time to act is now. Investing in modern, sustainable infrastructure is no longer optional — it is a strategic necessity for resilient, net-zero healthcare operations.

About the Analysts

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Silvia leads the team of IDC analysts covering the EMEA healthcare providers market and the Worldwide Connected Health and Medical Devices Digital Strategies research program. Her research provides strategic advice to end users and vendors in healthcare and life sciences, assisting organisations in understanding how technologies are disrupting and transforming traditional business models. Her analyses offer a comprehensive perspective on the foundational elements shaping the health industry's evolution.

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Federico Mayr is a senior research analyst for IDC Health Insights in Europe. He focuses on providing healthcare and life science organisations and their technology suppliers with the most relevant evidence and advice to navigate this fast-evolving industry. Before joining IDC, Mayr worked as a sales professional, realising how having reliable insights and up-to-date data is of paramount importance for the development of business opportunities and for strategic decision making.

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