

How Sustainable Are Our Hospitals?

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In 2003, the NHS outlined its commitment to sustainability as: “A sustainable health and care system works within the available environmental and social resources protecting and improving health now and for future generations. This means working to reduce carbon emissions, minimising waste and environmental pollution, making the best use of scarce resources, building resilience to a changing climate and nurturing community strengths and assets.”¹

There are countless reasons why sustainability is an ever increasing criteria across the healthcare sector, and is becoming increasingly important to the NHS. In this report I will explore why it is necessary for the NHS to become a more sustainable organisation, what measure they can and are taking to achieve this and what issues they face when doing so.

The Climate Change Act of 2008 is an example of a political factor that has shaped the NHS's approach to sustainability. It requires that all organisations in the UK must reduce their carbon emissions by 34% by 2020, then to 50% by 2025 and 80% by 2050. The NHS is also bound by further legislation: The Civil Contingencies Act of 2004 makes it mandatory for public bodies, like the NHS, to make preparations for future unpredictable and harmful extreme weather conditions; and The Public Services (Social Value) Act of 2012 specifies that commissioners need to consider economic, environmental and social benefits when developing their businesses in order to ensure they give a “value for money approach” when buying goods and services.² As a result of these legislations, the NHS face several challenges in embedding these values whilst providing healthcare services free of charge. The funding for improvements and the short time scale for the set targets being among these challenges. However, the set criterion ensures all members of the public who receive NHS healthcare are delivered a better quality healthcare and live in a

healthier environment, resulting in reduced health issues in the first place.

Financial penalties are another example of an incentive for hospitals to consider sustainability. The Carbon Reduction Commitment ensures that businesses like the NHS follow its Energy Efficiency Scheme. If the NHS does not meet the scheme's requirements, then they face consequential penalties. The act states that the businesses will be taxed for every tonne of carbon they emit from their buildings. As it currently stands, the tax rate is £15.60/tonne and the NHS' forecast energy bill for 2020 is £1.2bn. Equating to roughly 3.4million tonnes of CO₂ emissions, as a result of this. Therefore, just under half (£53m) of this bill is to taxes alone. Furthermore, the NHS are required to find £22bn worth of savings in efficiency by 2020/21 due to a £30bn funding gap (with £8bn promised by the UK government).² Economically, the business will benefit widely from increasing their energy efficiency and the resultant reduction in financial penalties will contribute to helping them bridge the funding gap.

According to The Lancet (an international medical journal) “Climate change is the biggest global health threat of the 21st Century.”²

In 2012 NHS England reported that their carbon footprint was roughly 20,000,000 tonnes of CO₂, this is almost equivalent to the value of CO₂ released by all of the aircrafts from Heathrow Airport in 10 years.⁴ The Newcastle upon Tyne NHS Hospitals' Sustainable Healthcare Strategy 2016-20 report expressed a very proactive attitude towards tackling the NHS' sustainability crisis and had much to say about the matter and their plans. When taking into account the impact of the legislations facing them they stated: “with the Carbon Reduction Commitment and the European Union's Emissions Trading Scheme leading the way. The cost of energy and carbon will continue to be a priority when planning how we deliver our healthcare activities in a changing climate. The benefit of operating a more sustainable organisation means that significant financial gains can be made from efficiency savings through environmental and socially focused projects”.²

The NHS are also faced with pressure from societal expectations, they're one of largest employers in Europe, they have a key role to play in reducing the effects of climate change. The NHS's sole purpose is to ensure good health of the general public across

the country, if they do not pay attention to the damages they are inflicting upon society as a result of their current methods of delivering healthcare, then they are not fulfilling their purpose. In 2015 a survey was conducted on people's view on the NHS's role in leading sustainability, out of the 1000+ members of the general public asked, 92% of them shared the belief that it was important for the NHS to work in a more sustainable way. A quarter of these people believe that it should be a top priority.²

In April 2014 the Green Investment Bank published a report – A Healthy Saving: Energy Efficiency and the NHS - where many strategies were proposed in aid of the operation to increase the business' sustainability. GIB says that they can see changes the NHS can install which could decrease their total energy bills by 20% in addition to reducing their greenhouse gas emissions by a quarter, which, in total could save up to £150 million.³ In the report they've outlined a list of possible solutions to resolve some shortcomings of the current NHS systems:

Lighting



Upgrading to light emitting diodes (LED) and other high efficiency lighting can reduce lighting energy costs by 50 – 80 per cent and extend replacement cycles which will have significant associated labour saving. Lighting quality has improved considerably in the last few years and in many instances is a marked improvement on the existing technology which degrades over time. Studies have also shown that improving the lighting can have benefits for patient care and recovery.

Waste management measures



Clinical waste incinerators and waste heat recovery systems could be designed into the overall energy centre solution to meet the heat and electricity requirements.

CHP



Combined heat and power (CHP) systems – also known as cogeneration systems – use a reciprocating engine or gas turbine to simultaneously generate both electricity and heat. They convert waste heat from electrical generation into energy that can be used for heating and cooling. Acute care facilities are ideal candidates for CHP systems because they function 365 days a year, 24/7, and require round-the-clock heat and electricity. CHP systems enable hospitals to reduce energy costs, improve environmental performance, and increase energy reliability.

HVAC



Heating, ventilation and control systems can be upgraded to be more energy efficient by providing heating and cooling as required and controlling the temperature within a much closer tolerance.

Building fabric



Building fabric upgrades will include such measures as increased insulation of roofs, cavity walls, solid walls and floors and replacement of single glazed windows with double glazed windows.

Biomass boilers:



A 4 MW biomass boiler, which has the capability of reducing CO₂ emissions by as much 4,500 tonnes each year, can be installed as part of a hospital wide central plant installation or can be installed as a standalone measure. Biomass boilers also benefit from the subsidies through the Government's Renewable Heat Incentive (RHI).



Service specific measures

Water/waste water/effluent systems can be made more energy efficient with specific measures in hospital laundries, catering facilities, compressed air systems, vacuum pumps, hydraulic systems, services to medical equipment, lift controls and other niche and specialist uses.



Fuel cells

Fuel cells are relatively new to commercial CHP and storage use in the NHS but are gaining popularity in large office developments where back-up and security of supply is just as important as the cost savings and ability to deploy these on constrained city centre sites. Carbon dioxide emissions are low during operation, but life-cycle emissions vary with fuel type. Although emerging quickly, the technology is not yet proven at scale in the UK.



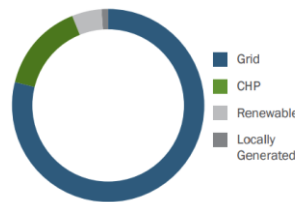
Other generation methods

Ground source heat pumps may be suitable as part of new build or refurbished health facilities where a constant heat load is required (similar to biomass this will benefit from RHI). Other alternative generation methods include solar panels (either thermal to heat water or photo-voltaic to generate electricity) and wind turbines on large sites outside of towns and cities.

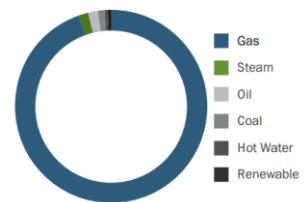
With these suggested improvements, the NHS have the opportunity to continually deliver high quality healthcare whilst reaping the economical benefits of utilising more efficient systems and resultant savings. Furthermore, as several of these suggestions reduce CO₂ emissions it helps the NHS to reduce the negative effects of their business on the environment and therefore overall improves society's quality of life.

As the NHS system is operative 24/7 they require electricity round the clock and heating on demand. The figure below is taken from GIB's report:

Electricity Usage by Source, NHS England



Heat Usage by Source, NHS England



As you can see, the percentage of electricity and heat usage from renewable sources is significantly low. Thus highlighting a great opportunity for the NHS to start investing more in renewable forms of energy when it comes to helping them power and heat their hospitals. The consequences of relying on these unsustainable sources mean that the NHS suffer as a business by paying higher energy bills as they aren't investing in smarter systems which can use the wasted energy usage and convert it back into useful sources again. Furthermore, when disastrous weather conditions strike, the hospitals are likely to take a hit due to the majority of their electricity being sourced off the grid. As a solution to these issues the hospitals could look into installing some of the GIB suggested sustainable measures. A further simpler solution could be to hand out heated blankets to patients in beds rather than heating whole wards. By implementing these suggested installations, like renewable energy generators on site, then the NHS can become a more environmentally friendly business.

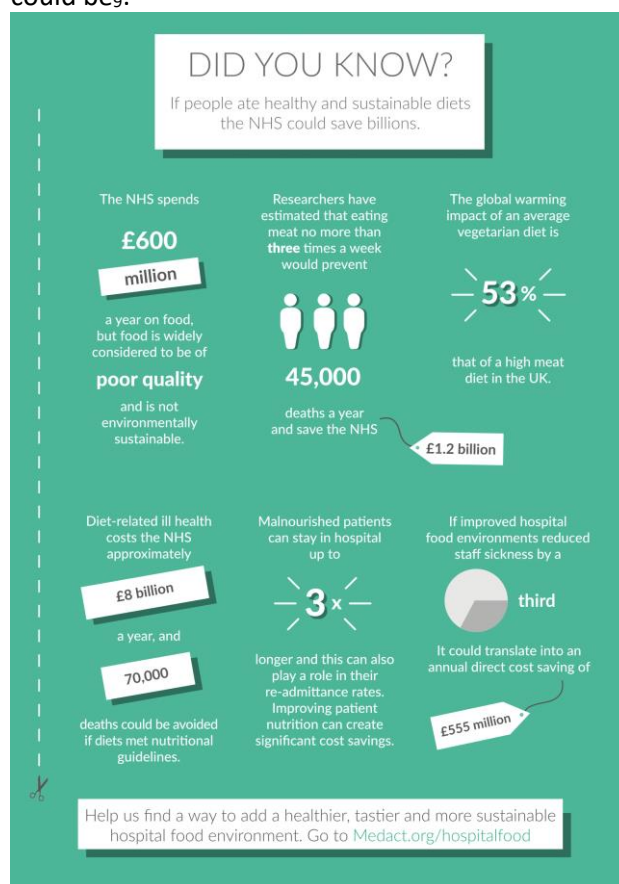
Other NHS Trusts have begun to make strides in improving their sustainability across the board. One example would be the Barts Health NHS Trust, who have made it their aim to be the most sustainable NHS trust by 2020₅. Already they've added several sustainable measures that have managed to save the NHS £9,221,966 and reduced their CO₂ emissions by 48,511 tonnes. The trust achieved this through implementing innovative solutions, like their staff "TLC" policy; an energy saving strategy where staff must Turn off computers, switch off Lights and Close doors to prevent heat loss. As a result of this new policy it has saved them £400,000 in savings and they received a third less sleep disruption complaints from patients. As an additional solution, they have introduced solar powered "Bigbelly" bins which compact down waste making it more transport friendly and increasing their sources of renewable energy. Plus, all their food waste is now diverted away from landfill and used in biogas generators for the hospitals or outsourced as fertilisers. Furthermore, to encourage patients and staff to live a healthier

active lifestyle, they handed out maps advising them on walking and cycling routes with less air pollution.⁶

Another pathway being pursued in the healthcare sector is the migration of medical care over to internet based interfaces. Earlier this year, Pharmacy2u published an advert which brought to light the fact that over 40% of people use repeat prescription drugs however, only 10% of people manage their prescriptions online. If all repeat prescription users were to utilise these online alternatives, like the free “delivered to your door service” that Pharmacy2u offer, then this could save the NHS £300 million alone on prescription costs.⁷ Plus, it would save people waiting in queues at pharmacies and GP surgeries when they could do other jobs they need to during the day and decrease further carbon emission. However, the elderly population are the most reliant on repeat prescriptions and in our current society there is a greater proportion of them when compared to the younger generation. As the elderly population have not grown up with many today’s technologies embedded in their life then they are at a disadvantage and find it much harder to get to grips with the fast paced interfaces. Also some patients have health issues – like arthritis - which restrict them to using traditional methods of healthcare treatments. Also those that have trouble reading require a GP/pharmacist to explain how to use their medications. Furthermore, many people might prefer the personal touch of traditional methods, particularly for some elderly patients it could be one of the few social interactions they get daily. Nevertheless, this is not to say that the aging population is unable to adapt, but maybe that the NHS could do more in helping them to adapt.

In spite of these changes, a challenge that the NHS face is the lack of awareness of the topic in some hospitals and many patients. However, staff cannot be expected to have a great knowledge of the sustainability concept if they have not come across the term before, and therefore they will not realise how they can help resolve the issue. Also if the NHS want their patients to reduce their carbon footprints then they need to be made aware and educated on how they can contribute. Currently, staff are only likely to hear about increasing sustainability measures through word of mouth or searching for the NHS solutions. Organisations like Care Without Carbon⁸ run seminars on sustainability and how staff can improve their

hospitals. Their website also advertises how people can get directly involved with the movement. But, more needs to be done to make this information more readily available. It is only when you go searching for information do you find out the severity of the matter and how it can be improved upon. And only when visiting GP practices and hospitals are you likely to be exposed to the NHS’s sustainability campaigns as they often promote educational posters for good healthcare practices in these places. I believe that if more was invested in advertising this information through additional platforms - like workplaces, gyms, schools etc. – then they would see an increase of awareness and hopefully in sustainable actions of the general public. One example of these promotional posters could be:



Due to the nature of many the services that the NHS provide, there is a substantial amount of waste produced – often it is infectious or toxic so it has to be incinerated. Obviously, this causes a detrimental amount of pollutants released into the atmosphere such as CO₂, mercury, nitrus oxides and harsh sterilisation chemicals. There is definitely room for improvements to be made in the way that they dispose of their waste or the products that they use for their services in the first place. For example, a group of healthcare representatives in America

discovered that that they could use a different type of endoscope needle for some of their surgeries which can be sterilised through steaming rather than their original needles used which required a chemical sterilisation pack. From implementing this change they saved \$1m every year and meant that they no longer needed these 17,000 sterilisation packs per year¹⁰.

The breakdown of the NHS's 20 million tonne carbon footprint is as follows: 17 percent is a result of staff and patient travel, energy usage contributes to 24 percent but alarmingly, almost two thirds of their emissions are linked to procurement of goods; of which 22% is due to pharmaceutical production alone. In the persute to lessen the impact of their carbon footprint and meet the set reduction targets, NHS Digital have made a Sustainability Plan 2017-20¹¹ in which they've decided on four main areas for the business to improve upon:

- Estates Emissions: reduce their gas, energy and water consumption by 30%.
- Transport Emissions: descrease rail travel and replace with video conferencing.
- Procurement Emissions: embed values of Government Buying Standards in their contracts, plus buying "greener" products/services.
- ICT emissions: reduce impact of IT related energy consumption, reduce the impat of data centres.

Overall I feel that the NHS has made a good start in trying to improve their sustainblilty, however the scale of their footprint still seems uncesserarily large despite the changes that are occurring; with little evidence of improvements being made to the major contributor - the procurement of their goods. This should be a top priority for the NHS to address moving forward. However, with the recently published Sustainable Development Plan 2017-2022 they have outlied that they want to tackle this issue so in the next few years to come it will be interesting to see how they go about sustaining their procurement chain. Addionally, the NHS's current method for disregarding their waste is a major issue needing to be addressed as the pollutants they release mainly have a negative effect on the environment and general public. Furthermore, if awareness of the sustainability issue had a greater presence around local communities then this would benefit the NHS in gaining more support from the public and MPs if they saw a shift in public attitudes as a result of this.

Finally, collaboration between hospitals could yield many benefits, and speed up development of sustainable practices, then collectively this would make the NHS significant savings and decrease its overall carbon footprint at a faster rate.

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