Sustainability in Healthcare Environments

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Strategic Estates Adviser to NHS North East
SHA Estates
### Climate Change Agenda

#### The Journey So Far

<table>
<thead>
<tr>
<th>Year</th>
<th>NHS Agenda</th>
<th>External Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>Bruntland Report, Hurricane hits England</td>
<td></td>
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<tr>
<td>1988</td>
<td>Establishment of Intergovernmental Panel on Climate Change (IPCC)</td>
<td></td>
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<tr>
<td>1990</td>
<td>UK temperatures reach record high 37.1 c</td>
<td></td>
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<tr>
<td>1992</td>
<td>Earth Summit, Rio – Agenda 21</td>
<td></td>
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<tr>
<td>1994</td>
<td>NHSE’s Achieving Energy Efficiency in Hospitals</td>
<td>UK one of 1st countries to respond with Sustainable Development Strategy</td>
</tr>
<tr>
<td>1995-6</td>
<td>Low Energy Hospital Reports</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>Earth Summit, Rio – Agenda 21</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>NHSE Environmental Policy</td>
<td>DETR’s green Guide to Construction</td>
</tr>
<tr>
<td>1999</td>
<td>NHS Estate Strategy Guidance (Environmental Impact prominence)</td>
<td>UK Round Table on Sustainable Development</td>
</tr>
<tr>
<td>2000</td>
<td>NHS Plan- 100 new hospitals</td>
<td>Increasing sustainable Development awareness across Government</td>
</tr>
<tr>
<td>2001</td>
<td>Sustainable Development in the NHS</td>
<td>OGC – Achieving sustainability in construction procurement</td>
</tr>
<tr>
<td>2002</td>
<td>New Environmental Strategy for NHS</td>
<td>World Summit on Sustainable Development - Johannesburg</td>
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<tr>
<td>2003</td>
<td>Estatecode – Environmental Management (Sixth Facet)</td>
<td>Our Energy, our future – Creating a low carbon economy</td>
</tr>
<tr>
<td>2004</td>
<td>NHS Carbon/Energy management</td>
<td>BRE Sustainability lessons from PFI</td>
</tr>
<tr>
<td>2005</td>
<td>Building for Health – London SHA’s</td>
<td>Securing the Future</td>
</tr>
<tr>
<td>2008</td>
<td>NHS Carbon Reduction Strategy &amp; HTM07-07</td>
<td>Climate Change Bill Implementation</td>
</tr>
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<td>2009</td>
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<td>NHS Carbon Reduction Strategy &amp; HTM07-07</td>
<td>Climate Change Bill Implementation</td>
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</tbody>
</table>

#### NHS England CO₂ baseline to 2020 with Climate Change targets

- **NHS England**
- **NHS England forecast**
- **2007 baseline**
- **Carbon Reduction Strata**: 10% target from 2007, 1990 baseline, 64% target from 1990, 80% target from 1990, 34% target from 1990
- **Carbon Budget Target**

**Graph Details**:
- **Y-axis**: Mt CO₂
- **X-axis**: Year (1990 to 2050)
- **Key**:
  - NHS England
  - NHS England forecast
  - 2007 baseline
  - Carbon Reduction Strata: 10% target from 2007, 1990 baseline, 64% target from 1990, 80% target from 1990, 34% target from 1990
  - Carbon Budget Target
The Route Ahead
“Climate change is the biggest global health threat of the 21st century.”
Documenting The NHS Climate Change Agenda

Climate Change Bill
Final Impact Assessment
Released for House of Commons introduction
April 2008

NHS England Carbon Emissions
Carbon Footprinting Report
May 2008

Improving the energy efficiency of our buildings
Agenda to display energy consumption and carbon reports for public buildings
• **Heatwave-related health problems:** Heatwaves are projected to become more frequent, resulting in increased heat and pollution-related illness & deaths as a result of hotter, drier summers. The very old & young, chronically ill and poor are most susceptible.

• **Cold-related illness & deaths:** Cold-related illness, falls, crashes and deaths are likely to decline due to warmer, wetter winters.

• **River, coastal flooding & flash floods:** The risk of major flooding disasters caused by severe winter gales, heavy rainfall and coastal erosion will potentially increase contamination of drinking water, increase water borne infections and exposure to toxic pollutants, accompanied with psychological consequences, disruption, injuries and deaths. Later effects of flooding include stress and mental health problems. River floods or storm surges, which can be forecast several days in advance, have fewer casualties compared to flash floods where there is no prior warning.

• **Infectious diseases:** Cases of food poisoning (Campylobacter infections, Salmonellosis) and water borne disease (Cryptosporidiosis) linked to warm weather are likely to increase.
This is underway

35,000 died prematurely as a result of Europe’s heat wave in 2003

Deadly heat wave holds firm in Europe

Temperatures throughout Europe continued above normal, as France reported as many as 3,000 deaths due to the heat.

Difference from normal temperatures Aug. 3 to Aug. 9, 2003

SOURCE: Climate prediction center, NOAA
The DH Response – Heatwaves

Long-term planning
The Department of Health, other government departments, local authorities, the NHS and public health authorities should work in partnership at national, regional and local levels to ensure long-term adaptation for heatwaves and to reduce the impact of climate change by promoting the following measures:

- Maintains a temperature of 26°C or below. Hospitals should aim to ensure that cool areas are created that do not exceed 26°C, especially in areas with high-risk patients.
- If temperatures exceed 26°C, high-risk individuals should be moved to a cool area that is 26°C or below.
- Cool areas can be developed with appropriate indoor and outdoor shading, ventilation, the use of indoor and outdoor plants and, if necessary, air-conditioning.
The DH Response - Flooding

Report on the lessons learned from the Summer 2007 flooding experiences from an Estates & Facilities perspective

DH Gateway Review: Estates & Facilities Division

<table>
<thead>
<tr>
<th>Area</th>
<th>When</th>
<th>No of households flooded</th>
<th>Reported deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central and Southern England</td>
<td>New Year floods, 2002/03</td>
<td>1,029</td>
<td>1</td>
</tr>
<tr>
<td>Wales</td>
<td>February 2004</td>
<td>150</td>
<td>None</td>
</tr>
<tr>
<td>Boscastle, Cornwall</td>
<td>August 2004</td>
<td>60</td>
<td>None</td>
</tr>
<tr>
<td>Carlisle</td>
<td>January 2005</td>
<td>3,000</td>
<td>3</td>
</tr>
<tr>
<td>River Tyne</td>
<td>January/February 2005</td>
<td>100</td>
<td>None</td>
</tr>
<tr>
<td>Central and Southern England</td>
<td>June/July 2007</td>
<td>49,000*</td>
<td>4**</td>
</tr>
</tbody>
</table>
NHS Carbon Reduction Strategy - Saving Carbon
Improving Health
www.sdu.nhs.uk

- Measure progress towards low carbon objective
- Board Approved Carbon Management Strategy (All NHS Organisations by 2009)
- Proposed Extension to Energy Fund
- All new buildings to be low carbon by 2015 & zero carbon by 2018
- Board Approved Travel Plan by 2010
- Target for Waste Management
- Sources of Carbon Emissions to be cut by improved procurement of goods & services
- Appropriate Pricing of Carbon within NHS
- Effective Incentives & Policies
- Annual Reports
Carbon Reduction Strategy
Update, 2010

1. More recent data
2. MAC Curves
3. Policy Wedges
4. Climate Change Act compliant trajectory curve
This table illustrates just some of the carbon saving measures that the NHS could implement. Not all are numbered above. Some CO₂ savings are too small to depict on this scale of graph.

<table>
<thead>
<tr>
<th>Measure</th>
<th>(£/tCO₂)</th>
<th>CO₂ Savings (tCO₂/yr)</th>
<th>£000 Savings (£000/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging of medical equipment</td>
<td>-40,299</td>
<td>2</td>
<td>+81</td>
</tr>
<tr>
<td>Reduce drug wastage</td>
<td>-3,987</td>
<td>22,430</td>
<td>+89,428</td>
</tr>
<tr>
<td>Teleconferencing to replace 5% of business miles</td>
<td>-2,038</td>
<td>6,827</td>
<td>+13,913</td>
</tr>
<tr>
<td>Decentralisation of hot water boilers in non-acute/PCT</td>
<td>-240</td>
<td>10,612</td>
<td>+2,547</td>
</tr>
<tr>
<td>Combined Heat and Power installed in acute trusts</td>
<td>-213</td>
<td>232,331</td>
<td>+49,487</td>
</tr>
<tr>
<td>Variable Speed Drives</td>
<td>-168</td>
<td>5,508</td>
<td>+925</td>
</tr>
<tr>
<td>Introduce hibernation system for ambulance stations</td>
<td>-135</td>
<td>1,096</td>
<td>+148</td>
</tr>
<tr>
<td>Improve heating controls</td>
<td>-134</td>
<td>26,551</td>
<td>+3,558</td>
</tr>
<tr>
<td>Improve lighting controls</td>
<td>-127</td>
<td>29,686</td>
<td>+3,770</td>
</tr>
<tr>
<td>Energy efficient lighting</td>
<td>-91</td>
<td>30,140</td>
<td>+2,743</td>
</tr>
<tr>
<td>Voltage optimisation</td>
<td>-75</td>
<td>29,364</td>
<td>+2,202</td>
</tr>
<tr>
<td>Improve the efficiency of chillers</td>
<td>-71</td>
<td>7,313</td>
<td>+519</td>
</tr>
<tr>
<td>Roof insulation</td>
<td>-65</td>
<td>25,928</td>
<td>+1,685</td>
</tr>
<tr>
<td>Energy Awareness Campaign</td>
<td>-61</td>
<td>92,549</td>
<td>+5,645</td>
</tr>
<tr>
<td>Building Management System optimisation</td>
<td>-56</td>
<td>20,610</td>
<td>+1,154</td>
</tr>
<tr>
<td>Improve Insulation to pipework, and/or boiler house</td>
<td>-55</td>
<td>11,195</td>
<td>+616</td>
</tr>
<tr>
<td>Install high efficiency lighting/controls - ambulance trusts</td>
<td>-55</td>
<td>2,999</td>
<td>+165</td>
</tr>
<tr>
<td>1 degree C reduction in thermostat temperature</td>
<td>-53</td>
<td>49,144</td>
<td>+2,605</td>
</tr>
<tr>
<td>Improve the efficiency of steam plant or hot water boiler plant</td>
<td>-52</td>
<td>8,933</td>
<td>+465</td>
</tr>
<tr>
<td>Upgrade garage and workshop heating</td>
<td>-49</td>
<td>214</td>
<td>+10</td>
</tr>
<tr>
<td>Boiler replacement/optimisation for HQ/control centres</td>
<td>-12</td>
<td>171</td>
<td>+2</td>
</tr>
<tr>
<td>Improve building insulation levels in ambulance trusts</td>
<td>-12</td>
<td>951</td>
<td>+11</td>
</tr>
<tr>
<td>Wall insulation</td>
<td>-8</td>
<td>25,928</td>
<td>+207</td>
</tr>
<tr>
<td>Office electrical equipment improvements</td>
<td>-4</td>
<td>7,957</td>
<td>+32</td>
</tr>
<tr>
<td>Travel Planning</td>
<td>0</td>
<td>81,524</td>
<td>0</td>
</tr>
<tr>
<td>Insulation - window glazing and draught proofing</td>
<td>+6</td>
<td>25,928</td>
<td>-156</td>
</tr>
<tr>
<td>Electric vehicles</td>
<td>+19</td>
<td>36,969</td>
<td>-702</td>
</tr>
<tr>
<td>Wind Turbine</td>
<td>+25</td>
<td>245</td>
<td>-6</td>
</tr>
<tr>
<td>Biomass Boiler</td>
<td>+35</td>
<td>30,533</td>
<td>-1069</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>823,638</strong></td>
<td><strong>179,987</strong></td>
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</table>
Health Technical Memorandum 07-07 draws upon and refers to sustainability policy and procedures that are already in place to direct development in achieving design excellence and national objectives.

Capital development schemes are now required to use the BREEAM Healthcare methodology to demonstrate that healthcare projects are built with sustainability in mind. This document makes extensive references to BREEAM Healthcare and offers guidance on how to comply with its criteria.

Climate-change Impacts

Energy and carbon efficiency

Low- to zero-carbon buildings approach

2.7 The Chancellor in his 2008 budget statement set an ambition for all buildings to be zero carbon by 2019, with the public sector aspiring to be zero carbon by 2018.
Sustainability By Design

Regulations /Planning
Business Case Submission
BREEAM Assessment
BREEAM Healthcare

When is BREEAM Healthcare required?

- All health authorities in the UK expect:
  - All new build schemes to achieve at least an **EXCELLENT**
  - All refurbishment schemes to achieve at least **VERY GOOD** rating using BREEAM Healthcare

  AND

- Note: (For part new build, part refurbishment schemes: If the refurbishment part accounts for 10% or more of the total floor area, the requirement is to achieve **VERY GOOD**)

bre
Scoring

Assessment Credits

- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution

Issue Category Scores → Environmental Weightings → Single Score

BREEAM Score

PASS 30%
GOOD 45%
VERY GOOD 55%
EXCELLENT 70%
OUTSTANDING 85%
Mandatory Credits (*Minimum Standards*)

<table>
<thead>
<tr>
<th>BREEAM : 2008</th>
<th>Minimum BREEAM Standards</th>
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<tbody>
<tr>
<td>Energy</td>
<td></td>
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<tr>
<td>Ene 1 - Reduction of CO₂ emissions</td>
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</table>

<table>
<thead>
<tr>
<th>Rating Level</th>
<th>P</th>
<th>G</th>
<th>VG</th>
<th>E</th>
<th>0</th>
</tr>
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<tbody>
<tr>
<td>Min. credits to achieve rating</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>10</td>
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</table>

To recognise and encourage buildings that are designed to minimise the CO₂ emissions associated with their operational energy consumption.

**Credit criteria**

Up to 15 credits are available:

<table>
<thead>
<tr>
<th>Credits</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>15</td>
<td>Where the building demonstrates an improvement in the energy efficiency of its building fabric and services and therefore achieves lower building operational related CO₂ emissions.</td>
</tr>
</tbody>
</table>
Houghton le Spring Primary Care Centre

First Healthcare BREEAM Outstanding
Thermal Walls- Innovation credit
Solar PV Panels 345m² – 35,200kwh/pa
Solar Thermal 10m² – 5,000kwh/pa
Ground Source Heat Pump
Wind Turbine 5,000-11,000 kwh/pa
Green Roof
Electric Car Charging Points
Transport Plan
Morpeth Health Centre
BREEAM Outstanding (85.5%)
Solar Thermal
Solar PV
Air Source Heat Pump
How far has your organisation got?

- Board level and operational sustainability leads
- Sustainable Development Management Plan
- Good Corporate Citizenship
- Measure footprint – DECs, smart meters
- Energy measurement and saving
- Procurement and Waste reduction
- Investment in renewables
- Carbon Trust NHS Management Plan
- SD Board Development
- Climate change on risk register
- Interest free loans
- Travel planning - reduce cost of business mileage