

## Energy efficiency in buildings

The goal is to continue the effective reduction of Scope 1 and 2 CO<sub>2</sub>e emissions to achieve a 40% saving by 2017 (currently over 30% from the 2007/8 baseline) and meet a very demanding energy performance retrofit target for existing buildings of 63GJ/100m<sup>3</sup>. Supporting the sustainable growth of the Campus and effectively managing the incorporation of the new Energy Innovation Centre and the additional benefits this will bring from 2016 onwards.



The Trust has an excellent record in actively

managing and subsequently reducing energy consumption and improving its efficiency in use (the bulk of the Scope 1 and 2 emissions). Despite significant site growth (from approx 500,000m<sup>3</sup> in 2007/8 to almost 670,000m<sup>3</sup> in 2012/13, an increase of around 25%), gross energy use from Scope 1 and Scope 2 emissions is approximately 16% less than it was in 2007/08 and stands at approximately 153,000MWh (by comparison a fully occupied medium usage 3 bedroom home would use approx 17MWh/year, i.e. heating and powering CUH is equivalent to 9000 such homes or approaching the domestic consumption of a town the size of King's Lynn).

These gross figures are even more impressive when adjusted for growth to produce building energy performance and carbon intensity figures. The former has fallen steadily from 133GJ/100m<sup>3</sup> in 2007/8 to 83GJ/100m<sup>3</sup> in 2012/13 (a year by year drop of 7-9% with 15% achieved in 2012/13) – for a rolling programme of individual retrofit projects (from lighting, to BMS connections, to heat exchangers to draught-proofing) this is an impressive record compared to the mandatory NHS figure for a full refurbishment of 55-65GJ/100m<sup>3</sup>. CO<sub>2</sub>e emissions, have fallen in line with this reduction by over 30% in terms of tonnes of CO<sub>2</sub>e/m<sup>2</sup> since 2007/8 – this compares very favourably with the NHS target of reducing all emissions

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by 10% by 2015 (CUH local target is 15%) and reemphasises the importance and weighting of Scope 3 emissions.

As an intense energy consumer, the importance of these reductions to the Trust cannot be underestimated. The Trust not only pays directly for its energy use but also for the carbon emissions it is responsible for. Achieving best value from the latter requires a full working understanding of the implications of the Carbon Reduction Commitment Energy Efficiency Scheme (CRC), the European Union Emissions Trading Scheme (EU ETS) including the new floor price for carbon and the Climate Change Levy (CCL) and any associated Climate Change Agreements (CCAs).

The building and infrastructure development associated with the Trust's role in the 2020 expansion of the wider Cambridge Biomedical Campus will bring very significant changes to how energy and carbon reduction is managed on site. The new Energy Innovation Centre (EIC) will establish new norms in heat and power generation, distribution and billing and the programming of energy efficiency work. There is also potential interim disruption to the routing of the CHP gas main which will have significant operational implications. On-site cooling plant is also currently subject to review.

In order to maximise site-wide opportunities, and to ensure that an expansive 'sustainability gap' does not open up between the existing older buildings/ infrastructure and the new development associated with campus expansion, it will be important to marry up the 2020 masterplan with a similar retrofit and refurbishment plan for the existing facilities. The use of data from individual Display Energy Certificates for these existing buildings may provide a useful means of prioritising work.

The Trust also acts as a provider of heat and power to most of the other partner organisations on the Biomedical Campus through carefully managing a mix of site inputs from national electricity and gas grid supplies to access to the CUH district heating system that draws on heat generation from the energy centre (gas-fired combined heat and power (CHP), incinerator and boilers). In 2012/13 the gross campus electricity bill was approximately £7.2m of which 56% was recharged back to other site partner organizations, for gas it was £3.5m with 35% recharged (total CUH energy utility bill of approx. £5.5m including some oil for back-up generator supply). This is therefore a complex system that needs to be rigorously managed and monitored to ensure best value is achieved in terms of both cost and carbon reduction. Transition to the new technology, system design, supply arrangements and energy performance contracts that will come with the new EIC will need to be managed with the same rigour and care.