

# Executive summary

**This research and development project - *Material Health* - set out to determine the mass balance and ecological footprint of the NHS in England and Wales, and is an important step towards quantifying the environmental impact of the NHS. It also highlights areas, which can most readily be tackled, and will help a move towards a more sustainable future.**

## Key findings of the study are listed below

### Mass balance analysis (pages 7 - 20)

In 2001, the NHS in England and Wales:

- Consumed an estimated total of **12,650 GWh of energy**. This is approximately 0.8% of all energy consumed in England and Wales.
  - 62% was produced from gas, and 4% from renewable electricity.
- Consumed approximately **1.3 million tonnes of products**.
  - 31% was medical & surgical equipment.
  - 73% of NHS spend was on clinical supplies.
- Consumed an estimated **53,256 tonnes of food**.
- Generated an estimated **384,698 tonnes of waste**, of which:
  - 261,086 tonnes was domestic. This represents 1% of all domestic waste generated in England and Wales.
  - 120,547 tonnes was clinical and 3,063 tonnes was special waste.
- Staff, patients and visitors **travelled 25 billion passenger kilometres**, of which:
  - 83% was by car & van and 70% by visitors.

- Consumed an estimated **49.8 billion litres of water**.
- Generated approximately **42.6 billion litres of sewage**.
- Occupied a physical land area of **33,654 hectares**.
  - 6% of NHS land is built land, of which 2% is car parks.
- Generated **3.18 million tonnes of emissions to air**.
  - 99.6% were CO<sub>2</sub> emissions.

Eco-efficiency can be calculated by dividing the resources remaining in the economy by resources consumed. In the case of the NHS, total stock build-up was 1,004,162 tonnes, while resource consumption was 1,388,860 tonnes (excluding water and energy consumption). **Therefore the NHS' eco-efficiency was calculated at 72%**. This means that for every tonne of material and product consumed by the NHS, 72% is retained while 28% is wasted. This compares positively to the UK's eco-efficiency of 52%.

## Ecological footprint analysis (pages 21 - 26)

The ecological footprint is a sustainability indicator, which expresses the relationship between humans and the natural environment. The ecological footprint accounts the use of natural resources by an individual, organisation or region. It is a 'snapshot' measure and typically refers to average annual consumption. Results are usually presented on a per capita basis using a standardised unit of area - the global hectare (gha).

In 2001, the ecological footprint of the NHS in England and Wales was 4,964,825 gha (global hectares) or 0.09 gha per capita.

- **Products and waste was 58%** of the total ecological footprint (2,866,647 gha)  
- 31% was furniture, office & computer equipment.
- **Patient, visitor and staff travel was 22%** of the total ecological footprint (1,115,345 gha).
- **Direct energy was 17%** of the total ecological footprint (865,661 gha).
- **Food was 2%** of the total ecological footprint (97,217 gha).  
- 77% was animal-based food products.
- **Water and built land were both 0.2%** of the total ecological footprint (8,485 gha and 11,470 gha respectively).

## Ecological sustainability of the NHS (pages 27 - 28)

In this study the ecological sustainability of the NHS has been reported in terms of environmental impact associated with the provision of healthcare services in relation to population served. **The ecological footprint of the NHS in England and Wales per capita is 0.09 gha, or 1.8% of the total ecological footprint per person.**

## Scenarios (pages 29 - 40)

Scenarios were developed to meet a set of criteria and were included if they were relevant to current NHS sustainability issues; data on which they were based was sufficiently robust, and realistic implementation is feasible within current NHS activities and structures. Three scenarios were identified and footprinted accordingly: Solar water heating, domestic waste and transport.

For solar water heating, three scenario options are presented. All scenarios calculated can reduce the hot water ecological footprint of the NHS in England and Wales, by between 2 % and 63 %. Associated CO<sub>2</sub> emissions could also be reduced. However, none of the scenarios would reduce the amount of direct energy consumed, and would therefore not contribute towards meeting the NHS' energy reduction target of 15% on 2000 by 2010.

The waste scenarios presented focus on waste recycling, and best practice. The scenarios indicate that waste recycling alone will not reduce the quantity of domestic waste generated by the NHS. For this reason a third scenario was developed to calculate the impact of combining both waste recycling and minimisation. This scenario illustrates that a combination of both recycling and minimisation is necessary to reduce the amount of waste generated by the NHS.

Two scenario options are presented for staff, patient and visitor travel. The scenarios are based on best practice travel plans from NHS case studies, and applied to NHS transport figures. They predominantly focus on modal switching, and illustrate the effectiveness of modal switching and the importance of car sharing to reduce the NHS in England and Wales' ecological footprint.

The scenarios give a clear indication of the power of ecological footprinting in identifying and communicating suitable options for decreasing the environmental impact of an organisation.