

Environment

Discovering, developing, manufacturing and selling pharmaceutical and consumer healthcare products uses energy and resources and produces emissions and waste.

Headlines

- **Launched a revised climate change programme which committed us to reducing our energy use from operations and transport and related climate change impact by 20 per cent per unit of sales by 2010 and by 45 per cent by 2015 (from 2006 levels)**
- **We are on track to meet these energy and climate change targets and expect progress to accelerate in 2008**
- **Remained on track for the elimination of CFCs by 2010**
- **Met annual targets for reductions in energy use, water use and wastewater pollution**
- **Did not meet targets for non-hazardous waste disposal or volatile organic compound releases to air but will develop plans to improve performance**

Our most significant environmental impacts are:

- Our climate change impact from operational energy use and propellants released from our inhaler products
- Release of pharmaceuticals into the environment after use by patients
- Raw material and water use
- Disposal of waste
- Emissions of volatile organic compounds during manufacturing

We strive to reduce the environmental impacts of our operations and products. After many years of managing emissions we are now working towards our long-term goal of environmental sustainability, designing more efficient processes that use fewer types and quantities of materials that are less hazardous and produce less waste. As well as benefiting the environment, this approach encourages innovation, helps reduce costs and improves relationships with our stakeholders.

We concentrate our reporting on the environmental issues that are most relevant to GSK and of most interest to our stakeholders. These are:

- Issues with a potential financial benefit or impact for GSK such as materials efficiency and energy efficiency
- Issues directly related to the use of chemicals such as volatile organic compounds, wastewater and hazardous waste

We have set company-wide targets to reduce these impacts (see [page 84](#) and [page 92](#)).

Environmental management

Our approach

Our EHS vision

To achieve sustainable competitive business advantage and environmental sustainability through leadership and excellence.

Overall responsibility for environmental issues rests with the Corporate Executive Team and the Board. The Chief Executive Officer represents EHS on the Board. The Board Chairman is the champion for GSK's climate change programme. The General Counsel has operational management responsibility for EHS on the Corporate Executive Team. The Vice President, Corporate Environment, Health and Safety reports to the General Counsel and has operational responsibility for EHS. The activities of the Corporate Environment, Health and Safety department are overseen by the Risk Oversight and Compliance Council, the Corporate Executive Team and the Audit and Corporate Responsibility Committees of the Board.

See the [background pages of our website](#) for more information.

Management system

We manage our environmental impacts through our integrated Environment, Health and Safety (EHS) management system. This covers risk identification, standards, training, target setting and audits. Our EHS system is aligned with the international standards ISO 14001 and OHSAS 18001.

See the [background pages of our website](#) for more information.

Policies

Our EHS Policy sets out the broad principles we expect our operations to meet. We have also established 64 Global EHS Standards which outline specific requirements for the company worldwide. We provide sites with an EHS management toolkit which contains detailed guidance to help them comply with the standards.

Read our [EHS policy](#) in the background pages of our website.

Stakeholder engagement

We engage with stakeholders at corporate and local level to inform our approach to managing EHS and to help identify emerging issues. This includes *ad hoc* meetings and formalised feedback from our stakeholder panel in the UK (created in 2005) and an EHS stakeholder workshop held in the US for the first time in 2007. We engage with regulators to help them develop controls that protect the environment while safeguarding the development and launch of new medicines. Read more about how we engage with stakeholders and the feedback we received in 2007 in the Stakeholder engagement section of this report, [page 11](#).

Strategy

Our EHS Plan for Excellence sets out our ten-year strategy to improve EHS performance up to 2015. The Plan is reviewed every five years and new targets are set. It is designed to support GSK's business strategies and contains three aspirations:

- EHS fundamentals embedded in the business – to produce and sustain high EHS performance we need to combine structured EHS systems with the attitudes and values that create a positive EHS culture. To achieve this we need to embed EHS awareness and systems in all GSK activities.
- Environmental sustainability – to embrace environmental sustainability as a driver for competitive advantage we need to define the principles of environmental sustainability and progressively integrate them into the business, translating them into practical action.
- Open and transparent EHS external relations – external stakeholders who have a legitimate interest in the company's EHS affairs should have ready access to relevant information and the opportunity for dialogue about issues that concern them. Building open relationships and partnerships can lead to business opportunities, while failure to engage may damage our reputation.

Each of these aspirations is supported by strategic objectives with performance targets in key areas.

Read more about our [EHS Plan for Excellence](#) in the background pages of our website. We use annual action plans based around a specific theme which focus our efforts on priority issues. The theme for 2007 was 'EHS Stewardship'. This means integrating environmental performance into manufacturing and business processes while also building environmental and safety considerations into decision making.

Further information about [our annual action plan](#) is available in the Environment, Health and Safety background section of our website.

Training and awareness

We provide training and awareness programmes to inform employees about risks, to create a culture where environment, health and safety thinking is an integral part of doing business, and to help employees understand the EHS issues specific to their jobs. For example employees handling chemicals need to understand the properties, hazards and necessary precautions associated with those substances.

EHS training is included in induction training for many new employees with EHS responsibilities, with regular training in areas specific to employees' job duties. Regional groups get together to discuss topical issues and to share good practices.

People who are responsible for EHS programmes are encouraged to attend relevant seminars and anyone who deals with EHS issues or programmes receives job training. Some EHS training is also available through *myLearning*, GSK's online training service. Most EHS training is managed at site level and is allocated according to job roles.

For more information see [EHS Communication](#) in the background pages of our website.

Audits and compliance

We regularly audit our operations, contract manufacturers and key suppliers to assess compliance with legislation and implementation of our EHS standards. Audits also assess whether appropriate management systems are in place to improve performance and maintain compliance. Our internal auditors are certified as lead auditors against the ISO 14001 and OHSAS 18001 standards.

We use a risk-based approach to determine the frequency of audits and to focus assessments on the most significant environmental risks. All GSK manufacturing and R&D sites are audited at least once every four years. Sites are also expected to conduct routine self-audits of their EHS programmes. We require sites to develop plans to address any weaknesses identified by audits and monitor progress with implementation of these plans.

In 2006, we began a four-year programme to certify all GSK manufacturing sites to the international environmental standard ISO 14001 and the health and safety standard OHSAS 18001.

Read about our approach to auditing our suppliers in the [Supply chain](#) section of this report, page 70.

Reporting suppliers' EHS performance

We want to understand the total EHS footprint of the processes used to make our products. This means measuring the impacts of our suppliers of active pharmaceutical ingredients and product components, as well as those from our own operations.

Over the past few years it has proved difficult to obtain environment, health and safety performance data from these suppliers just for the products that they manufacture for GSK. In 2007, we surveyed a sample of suppliers to determine their problems with providing the data. As a result of the survey we have refined our parameters for performance measures and conducted a pilot survey.

We have also put in place an electronic system to collect data from critical suppliers. Critical suppliers include suppliers of active pharmaceutical ingredients and product components and other suppliers that present the greatest risk to GSK on issues relating to security of supply, regulation, and process and materials hazards and environmental impacts.

Suppliers' EHS performance

For the first time in 2007 we used an electronic system to collect EHS data from a sample of our suppliers. This was a first step toward determining the total environmental footprint of the processes used to make our products. We recognise that this does not represent a complete picture of the EHS profile of our suppliers and we plan to continue to refine our collection of EHS data from significant suppliers of our active pharmaceutical ingredients and finished products.

This was a test of the capability of the electronic system and of the response rate. We contacted 52 of our 'critical suppliers' (see [supplier section page xx](#)). The electronic system functioned well and 21 of the 52 suppliers responded giving a response rate of 40 per cent.

These 21 suppliers provided the following information about their energy and water use, waste generated and injuries and illnesses.

Energy use

0.5 million gigajoules used by suppliers in addition to 19.0 million gigajoules used by GSK

12.6 per cent of electricity generated from renewable sources compared to 1.8 per cent in GSK

Water use

4.6 million cubic metres of water used by suppliers in addition to 20.9 million cubic metres used by GSK

Hazardous waste

24.9 million kilograms generated by suppliers in addition to 218.4 million kilograms generated by GSK

56.7 per cent of hazardous waste was solvent waste compared to 92.7 per cent for GSK

52.0 per cent of hazardous waste was recycled compared to 68.7 per cent for GSK

Non-hazardous waste

5.9 million kilograms generated by suppliers in addition to 120.1 million kilograms generated by GSK

16.2 per cent recycled compared to 68.1 per cent for GSK

82.6 per cent disposed to landfill compared to 19.2 per cent for GSK

Injury and illness

Reportable injuries and illnesses per 100,000 hours worked were 3.2 compared to 0.66 for GSK

Lost time injuries and illnesses per 100,000 hours worked were 2.4 compared to 0.33 for GSK

Calendar days lost per 100,000 hours worked were 6.7 compared to 7.6 for GSK

Our performance

Targets

We set company-wide targets to manage our most significant environmental impacts (see table). We have revised our energy and CO₂ emissions targets as part of our new climate programme (see [page 80](#)). Our materials efficiency goal aims to reduce consumption of resources which in turn reduces emissions to air and water and production of waste. Targets and performance are normalised by sales based on a constant exchange rate.

	Target	Progress in 2007
EHS audit scores	Average: 82 per cent by 2010 Minimum: 70 per cent by 2010	78% 58%
Energy for operations and transport	20 per cent reduction per unit of sales from 2006 baseline by 2010	reduced* 1%
Climate change impact from energy for operations and transport ¹	20 per cent reduction per unit of sales from 2006 baseline by 2010	reduced 2%
Solid waste	1 per cent annual reduction from 2006 baseline per unit of sales	increased 2%
Water	2 per cent annual reduction from 2006 baseline per unit of sales	reduced 8%
Wastewater (chemical oxygen demand)	3 per cent annual reduction from 2006 baseline per unit of sales	reduced 11%
Ozone depletion ²	100 per cent elimination by 2010 from 2006 baseline	eliminated 54%
Air emissions (volatile organic emissions)	2 per cent annual reduction from 2006 baseline per unit of sales	increased 4%

*attained our 2007 target of 1% energy reduction

¹Climate change impact is measured as CO₂ equivalent emissions

²Includes ozone depletion potential from production and refrigeration losses

Targets and performance normalised by sales are based on a constant exchange rate

Audits

In 2007, we audited 33 GSK sites for implementation of our EHS standards. The average score was 78 per cent (compared to 74 per cent in 2006). The lowest score we consider to be acceptable is 50 per cent. No site scored below this level and there were no critical findings (findings which indicate a high probability of incidents with potentially serious consequences).

Three sites achieved 'leadership' scores above 90 per cent (two in 2006), while a further 14 achieved scores over 80 per cent (ten in 2006).

The best performance on environmental issues was in:

- Waste management
- Energy efficiency
- Water management

Sites were generally weakest on:

- Waste minimising
- Recycling

Twenty-three of our 80 Pharmaceuticals and Consumer Healthcare manufacturing sites are now certified to the ISO 14001 and OHSAS 18001 standards (a further three are certified to ISO 14001 only). One Consumer Healthcare R&D site is certified to both standards and one GSK Biologicals site and one Pharmaceuticals R&D site are certified to ISO 14001. The certified sites are in Argentina, Brazil, China, Egypt, France, Germany, India, Italy, Japan, Kenya, Mexico, Poland, Saudi Arabia, Spain, Turkey, the US and the UK.

See [Health and Safety](#) on page 105 for more information on audit results.

Compliance

There were no fines or penalties reported in 2007.

Awareness

These are some of the ways we raised awareness about EHS in 2007:

- The *myEHS* Community intranet site. This includes the *EHS Manager* information system with policies, standards, guidelines, tools, training materials, examples of best practice and news
- The CEO EHS Excellence Awards (see below)
- Earthweek, run every June to coincide with World Environment Day. In 2007, over 17,000 employees from 61 sites in 39 countries took part. We sent information kits to all sites to help them develop their own activities including tree planting, clearing litter from a local forest and involving local school children in drawing competitions with an environment theme
- An article in our internal magazine, *Spirit*, to raise awareness of our new climate strategy
- A company-wide live broadcast to raise awareness of how employees can be more aware of climate change and help reduce energy use
- EHS bulletins which profile successful EHS projects at GSK sites during the year

EHS Excellence Awards

This recognises people who have done exceptional work in promoting and implementing EHS projects. In 2007 – the sixth year of the awards – there were 86 entries from 30 countries and from all GSK's business sectors. Top honours were made to 11 projects from Australia, Belgium, Canada, Germany, India, Ireland, Singapore and the UK.

Three of the 2007 first place award winners are featured in this report. All the winners act as examples of innovation and best practice for other sites. They receive a trophy as well as a donation to the charity of their choice. See further details on the [CEO's EHS Excellence Award](#) background pages of our website.

REACH preparation

In 2007, we worked to reduce risks to continuity of supply of chemicals presented by the introduction of the EU's Registration, Evaluation and Authorisation of Chemicals (REACH) legislation. This involved:

- Assessing the scope of operations potentially affected by REACH and identifying any substances manufactured by GSK that will require registration in June 2008
- Preparing inventories of all chemicals covered by REACH that we purchase. This involved the evaluation of over 3500 chemicals
- Contacting companies that supply GSK with chemicals covered by REACH to assess their management of potential risks to continuity of supply to GSK. This involved the evaluation of 650 suppliers

Global Harmonisation of Classification and Labelling (GHS)

We continued to prepare for impending changes to classification and labelling of hazards as part of the UN's GHS regulation. This included:

- Changing the way we produce safety data sheets to ensure compliance
- Developing training for employees on new hazard warning symbols and labels introduced as part of GHS

Climate change

Our approach

We are committed to reducing our impact on climate change. This year we launched a new climate programme which focuses on reducing energy use in our operations (facilities and processes) and for transport of products and employees (see feature box). We set new targets to reduce our climate change impact (CO₂ equivalent emissions) and energy use in operations, and transport from 2006 levels by 20 per cent per unit of sales (based on a constant exchange rate) by 2010 and by 45 per cent by 2015. As well as benefiting the environment, taking action on climate change helps us cut costs, improves our reputation with stakeholders and helps us prepare for future legislation on emissions.

Read our [position paper](#) on energy management in the background section of our website.

We are also researching ways to minimise the amount of greenhouse gases released when our propellant inhaler products are used by patients for asthma and chronic obstructive pulmonary disease. These account for two-thirds of our climate impact. Propellant inhalers contain either hydrofluoroalkanes (HFAs) or chlorofluorocarbons (CFCs) which ensure a consistent dose but are thousands of times more damaging to the climate than CO₂. CFCs also deplete the ozone layer (see [page 90](#)).

Our updated climate change programme



Building on our 2001 to 2005 programme to reduce energy use and related climate change impact, we initially established an energy conservation programme in 2005 with an energy reduction target of one per cent per year, normalised by sales, (based on a constant exchange rate). Following the fourth assessment report of the Intergovernmental Panel on Climate Change, published in 2007, we revised our programme and committed to new targets. These are to reduce our climate change impact (CO₂ equivalent emissions) and energy use in operations and transport from 2006 levels by 20 per cent per unit of sales (based on a constant exchange rate) by 2010 and by 45 per cent by 2015.

We will achieve these targets by:

- Making our buildings and equipment more energy efficient
- Installing onsite renewable technologies such as wind turbines and photovoltaic panels
- Buying electricity produced from renewable sources
- Reducing the climate impact of travel and transport by switching from air to sea freight and by transporting more per load to reduce the number of journeys needed

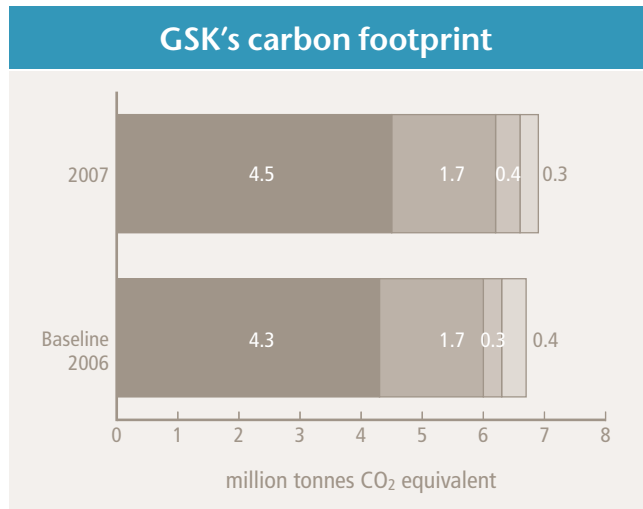
The Corporate Executive Team approved a central fund to finance these energy saving projects. In 2007, the EHS team consulted with GSK businesses to identify potential energy savings at site level. Over 400 projects were identified and a cross-business team has been set up to manage selection and implementation of these projects.

Emissions trading

A number of UK sites participate in the government's voluntary Climate Change Agreement scheme which provides companies with energy tax rebates if they meet agreed energy efficiency targets. Although 2007 was not a reportable year, performance in 2007 indicates that all participating GSK sites will comply with their Climate Change Agreements in 2008.

Several GSK sites participated in the European Union Emissions Trading Scheme. Collectively these sites emitted below their specified CO₂ allowances, generating a surplus of carbon credits. Proceeds from the sale of carbon credits are invested in energy saving projects.

Our performance



Key:

- Climate impact from use of inhalers by patient
- Climate impact from operations energy
- Climate impact from travel and transport
- Climate impact from other³

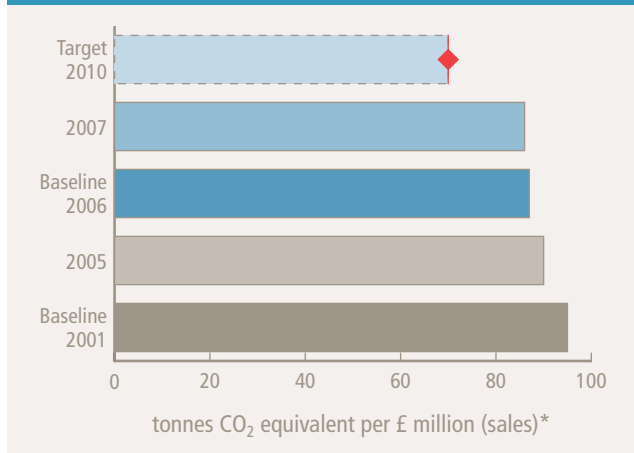
³Includes climate change impact from greenhouse gases released from cooling systems, during the production of inhaler products, from wastewater treatment and other processes.

In 2007, our carbon footprint was equivalent to 6.9 million tonnes of CO₂ compared to 6.8 million in 2006. The majority of our emissions come from the use of inhalers by patients with respiratory disease and in 2007 the use of these medically important devices increased, with emissions from inhalers increasing from 4.3 million tonnes of CO₂ to 4.5 million tonnes.

If we exclude the use of inhalers, our carbon footprint reduced from 2.5 million tonnes of CO₂ in 2006 to 2.4 million tonnes in 2007, reflecting energy efficiency progress across the business. A small component of our carbon footprint is the greenhouse gases emitted during the production of inhaler products, from wastewater treatment and other processes as well as from leakage from cooling systems.

We use the Greenhouse Gas Protocol for all of our calculations of CO₂ emissions.

Climate impact from operations energy and transport



Key:



Climate impact

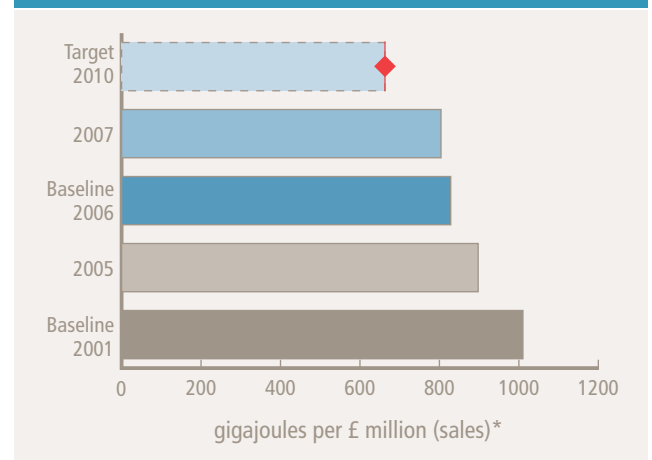
Year	tonnes CO ₂ equivalent per £ million (sales)*
2001	95
2005	90
2006	87
2007	86

*Targets and performance normalised by sales are based on a constant exchange rate.

Thirty per cent of our carbon footprint is attributed to emissions from energy for operations (facilities and processes) and transport of products and employees. While absolute climate change emissions from these sources changed less than a half per cent, our emissions per £ million of sales reduced by 1.6 per cent. We emitted 85.9 tonnes of CO₂ equivalent per £ million of sales at constant exchange rate, compared to 87.3 tonnes per £ million of sales in 2006. We expect progress toward the new 2010 targets to accelerate in 2008 as the climate change programme gets underway.

Our energy use from operations and transport on which these CO₂ emissions are based, decreased 1.3 per cent from 1037 to 1024 gigajoules per £ million of sales.

Energy consumption



Key:



Energy consumption

Year	gj per £ million (sales)*
2001	1010.1
2005	897.5
2006	828.4
2007	804.0

*Targets and performance normalised by sales are based on a constant exchange rate.

Any errors found in data from prior years are corrected so data may vary slightly from earlier reports.

Seventy-nine per cent of our energy use is attributed to energy for operations (facilities and processes). In 2007 our absolute energy use in this category decreased by 1.1 per cent to 19.0 million gigajoules. Global Manufacturing and Supply (GMS), our active pharmaceutical ingredients manufacturing group, Biologicals, our vaccines manufacturing and research group and our Pharmaceuticals Research and Development (R&D) group accounted for 56 per cent, 14 per cent, and 25 per cent respectively.

Between 2001 and 2006 our energy efficiency programme achieved incremental gains in energy efficiency by focusing on operational changes. These included optimisation of equipment use, resetting thermostats and changing to energy efficient lighting. In 2007, our energy use per £ million of sales based on a constant exchange rate, decreased 2.9 per cent, exceeding our previous target of a one per cent per year improvement.

In mid 2007 we revised our climate change programme to include more challenging targets covering energy for operations (facilities and processes) and transport of products and employees. These will be achieved through investment in energy efficiency projects which will bring more significant gains over a longer time frame. We approved funding for these projects in late 2007 and when fully implemented we expect them to deliver significant energy savings.

Since 2006, some parts of our business continued to make incremental gains in energy efficiency but growth in our vaccines business and the associated increases in energy use partially offset these efficiency gains.

For more information on our work to [increase energy efficiency](#), see the background pages of our website.

Saving energy in Singapore

Our site at Jurong in Singapore has reduced its energy use by 13,000 MWh per year since 2002 through a comprehensive energy savings plan. This includes equipment upgrades, installation of environmentally-friendly technologies and a programme to engage and motivate employees.

Jurong manufactures active ingredients for medicines, including those used in the treatment of HIV, hepatitis B and asthma. Over the last ten years the number of medicines in production at Jurong has increased. In 2002 site managers predicted that Jurong's electricity consumption was likely to increase by around 40 per cent by 2006.

A comprehensive energy savings plan was introduced to reduce the site's operating costs and minimise its impact on the environment. This includes:

Involving GSK employees

Regular awareness campaigns are run to educate employees about energy saving behaviour. Energy reduction targets are built into personal development plans and employees who achieve their goals are recognised through excellence awards.

Improving the efficiency of equipment

Manufacturing processes can generate a lot of heat, wasting energy. The site has improved air conditioning and ventilation systems to cool down equipment more efficiently and reduce energy use. Maintenance and repairs on all equipment is carried out on a regular basis. If anything is damaged it is replaced with the most up-to-date and energy efficient part available.

Installing new technologies

Solar panels have been installed to provide renewable energy to the site.

As a result of these measures the Jurong site has:

- Prevented a projected 40 per cent increase in energy usage
- Reduced energy use by an average of 30 per cent per year since 2003
- Saved 22,269 tonnes of CO₂ since 2003
- Created an energy saving culture among employees

Transport of products and employees

In 2007, we estimate that transport of our products and employees accounted for 367 million kilograms of CO₂ compared to 340 million kilograms in 2006. This was equivalent to about 18 per cent of our climate change impact from energy. This increase was due to improvements in our data collection systems. We identified shipping routes by air, sea and road not captured in previous data. 2007 data also include additional air travel originating in the US.

Business air travel accounted for 30 per cent of our travel-related CO₂ emissions. Our global sales fleet accounted for 34 per cent of our travel-related CO₂ emissions.

Transport of our products from manufacturing plants to distributors accounted for 36 per cent of our travel-related CO₂ emissions. The majority of our products were transported by air freight (accounting for 75 per cent of our product transport-related CO₂ emissions). These are some of the ways we aim to reduce the impact of transporting products:

- Consolidating freight shipments
- Reducing the number of shipping points
- Making more use of round tripping (managing inbound freight trucks so they do not return empty)
- Switching from air to sea transport where possible (see case study).

Reducing CO₂ emissions through sea freight

GSK Europe has significantly reduced CO₂ emissions and saved money by distributing goods using sea freight, rather than by air.

Hamburg in Germany – the world's ninth-largest container port – is one of our global distribution hubs. GSK medicines are sent from our Bad Oldesloe distribution centre via the port to the Middle East, Asia and Europe.

GSK products delivered to Dubai, Japan, Singapore and Iceland from Bad Oldesloe are now transported by boat rather than plane. This has reduced carbon dioxide emissions for these routes by 96 per cent – a total of 10,140 tonnes between 2005 and 2007.

Making the switch did not just benefit the environment. It brought a cost saving of €800,000 between 2005 and 2006 and improved product quality. This is because sea containers have better temperature control than those used in air freight. There has also been less theft and damage because containers transported by sea are sealed at the dispatch site and not re-opened until they reach their destination.

We are now planning to switch from air to sea freight for deliveries from Bad Oldesloe to China, Australia and South America.

Travelling to work

We have 'green travel plans' at a number of sites to encourage employees to reduce the environmental impact of their travel to work. For example, at GSK House in Brentford, UK, privileged parking spaces are given to car-sharers and drivers of fuel-efficient cars. Buses powered by biodiesel run to and from the local train station, while changing rooms and showers are provided for cyclists as well as discounts for bicycle equipment and repairs. We are beginning to use hybrid-engine cars for our chauffeur service.

Product climate impact

We have been phasing out CFCs from our inhaler products for the last 15 years. Only two per cent of our inhalers now contain CFCs and we have committed to a complete phase-out by the end of 2010 and we are on track to meet this target.

The replacement propellants, HFAs, have a lower but still significant global warming potential – 16 per cent of the global warming potential of CFCs. GSK also offers dry powder inhalers for asthma sufferers which contain no greenhouse gases. These are not suitable for all patients, particularly children and the elderly, as they do not contain propellants and rely on a person's lung power for the active ingredients to be administered.

We are exploring ways to reduce the amount of HFAs released from our inhaler products. Possible options include:

- Minimising the volume of HFA 134a used per inhaler by either changing the product or the way it is delivered
- Reducing HFA 134a emissions in manufacturing

Read more about the environmental impacts of our inhalers in [Ozone depletion](#) on page 90 of this report.

Product stewardship

We take the environment into account across the entire lifecycle of our products. This begins with process design and continues through manufacturing to use by the patients and eventual disposal. EHS stewardship was our EHS theme for 2007, consistent with our move away from managing risk to concentrate on opportunities presented by increased process efficiency, one of the elements of environmental sustainability that we identified as a particular focus.

Cutting the environmental impact of our UK household brands

In 2007 our UK Nutritional Healthcare division launched a new sustainability strategy, led by Graham Neale, to cut the environmental impacts of our household brands.

The process started with a detailed carbon footprint analysis for nine *Ribena*, *Lucozade* and *Horlicks* products. This showed that the most significant environmental impacts relate to packaging and ingredients. Energy use, water and waste are also significant. We have set targets to reduce the environmental impacts in each of these areas.

Our ingredients target

- To have sustainable sourcing strategies in place for all major ingredients, such as fruit and carbohydrate by 2010

Our progress – We source all our blackcurrants for *Ribena* in the UK, avoiding the environmental impacts of long-distance transport. We partner with the Wildlife Trusts and growers to boost biodiversity on blackcurrant farms. We have also worked closely with the Scottish Crop Research Institute to develop two new varieties of blackcurrant which are resistant to the new weather conditions likely to arise from climate change.

Continued on page 84

Our packaging targets

- Reduce the amount of packaging we use by 25 per cent by 2010
- All packaging to be made from 50 per cent recycled materials by 2010
- All packaging to be 100 per cent recyclable by 2010.

Our progress – We use an average of 40 per cent recycled plastic in our bottles. We can achieve a higher percentage (we now use 100 per cent recycled plastic for our *Ribena* ready-to-drink range), but are limited by the availability of recycled plastic. We are making packaging lighter and easier to recycle.

For example we have reduced the weight of *Lucozade* bottles from 26 gm to 23 gm since 2004. Most of our products are consumed outside the home so this is where most recycling needs to take place. We are testing reverse vending machines to recycle bottles in shopping centres ([see case study on page 86](#)) and working with Closed Loop London and some major retailers to support recycling in the workplace. We helped set up an environmental taskforce at the Union of European Beverage Associations to improve recycling across the soft drinks industry.

Our energy target

- Reduce energy use in manufacturing and distribution by 20 per cent by 2010.

Our progress – Since 2002 the Coleford facility has increased production by 19.6 per cent but energy has only grown by 15.1 per cent representing an improvement in the energy efficiency of the site.

Our waste and water use targets

- Reduce water use by 20 per cent by 2010
- Reduce manufacturing waste sent to landfill by one per cent each year up until 2010

Our progress – Nutritional Healthcare products are manufactured at two main sites in the UK, at Coleford and Slough, which already recycle at least 95 per cent of their waste.

Our approach

Process design

Process design is essential to minimising environmental impacts. It determines which chemicals and processes are used in manufacturing as well as the impacts from the wastes of production. The EHS team works with process development teams to incorporate EHS considerations into process design and materials sourcing, and to identify potential EHS risks in manufacturing.

GSK scientists and engineers use an eco-design toolkit to identify process improvements and EHS issues. The toolkit has five modules:

- **Green Chemistry/Technology Guide** – information on using chemistry to improve resource efficiency, reduce EHS impacts and minimise costs
- **Materials Guides** – information on the environmental impacts of materials, including solvent and chemical selection
- **Green Packaging Guide** – an assessment tool for selecting packaging
- **FLASC (Fast Lifecycle Assessment for Synthetic Chemistry)** – a web- tool for assessing the environmental impacts of different chemical processes and identifying the 'greenest' materials
- **The Chemicals Legislation Guide (CLG)** – identifies legislation on hazardous substances and provides guidance about chemicals of concern

See more on the toolkit and our approach to [process design](#) in the background pages of our website.

Each year we collect green chemistry metrics for every batch of potential new medicines under development (known as a campaign) – over 100 in 2007 – to measure progress on our product stewardship objectives. These include assessments of how efficiently we use raw materials, what solvents and 'materials of concern' we use and their EHS impacts. Each campaign is scored on its environmental impacts across its lifecycle (using the FLASC system). The FLASC scores depend on the complexity of the drug substances in development. This year they worsened slightly because of the increased complexity of some of the compounds we are producing.

We give feedback to the development teams based on this review, and share best practice.

Materials efficiency

We aim to increase the efficiency with which we convert raw materials to finished products. Known as materials efficiency, this helps reduce the resources we use, the waste we generate and the cost of production.

Pharmaceutical processes are often complex, usually requiring large amounts of solvents and other raw materials. Typically, the industry uses about 100 tonnes of material for every tonne of active pharmaceutical ingredient (API) produced. That materials efficiency compares to about 20 per cent for the fine chemicals industry and 50 per cent for bulk chemicals. We have set a target to double the average materials efficiency of manufacturing processes for new products introduced between 2006 and 2010.

Making toothpaste production more sustainable

GSK is a leading manufacturer of oral care products with a European market share of over 22 per cent. Our Maidenhead site in the UK produces over 400 million units of toothpaste and mouthwash each year. In 2007, the site introduced a new 'continuous manufacturing' process to cut its environmental footprint. This is the first time this process has been used in the oral care industry.

Previously toothpaste at the site was made in batches. Equipment needed to be washed when there was a change of active ingredient. With continuous manufacturing, toothpaste production continues 24 hours a day. Formulations are changed less often and equipment does not need to be washed so frequently. This saves water and reduces the chemicals used for cleaning. It also results in less waste, helping to cut costs.

Each year the new process will reduce:

- Raw material waste by almost 24.5 tonnes
- Water consumption by 20 million litres
- Costs by £45,000

The equipment has proved reliable and efficient and we are looking for opportunities to introduce the same process at other GSK manufacturing sites.

The environmental impact of our products is also becoming more important to our retail customers. For example, during 2007 Wal-Mart, one of our biggest global customers, asked us to assess the amount of CO₂ released across the lifecycle of our toothpaste products in the US – from the manufacturing and supply of raw materials through the manufacturing, packaging and transport of the finished product.

Materials of concern

Materials of concern are chemicals where scientific evidence shows probable serious effects to humans or the environment and for which there is existing or potential future legislation that may restrict use. These compounds are usually persistent in the environment, bioaccumulate in animals and plants or are toxic to life.

Our EHS team is working with our process development teams to help them develop strategies to eliminate or substitute the use of these materials.

Read our position paper on [hazardous chemicals management](#) on our website.

Pharmaceuticals in the environment

Active pharmaceutical ingredients (the substances that make medicines work) are eventually excreted by humans and enter the sewage system. Wastewater treatment removes most pharmaceutical residues but small concentrations do end up in rivers or in the sea. In countries where wastewater is not treated, higher concentrations may enter the environment.

We conduct environmental tests and risk assessments on new pharmaceutical products. These indicate that our products do not appear to pose a risk for humans or the environment based on current risk assessment methodologies.

In the EU and US, environmental risk assessments are part of the approval process for new medicines. These allow regulatory agencies to assess the potential for environmental impacts of drugs pending approval.

We continue to monitor the latest scientific studies and findings to improve our risk assessment methodology. We also work with other pharmaceutical companies, universities and research groups in this area and collaborate on joint projects with industry groups. For example, we submit environmental data on our products as part of the Swedish classification system for pharmaceuticals, a collaboration between the Swedish Pharmaceutical Association and the Swedish government. This is a voluntary transparency initiative making information about environmental risks available to the public, doctors and scientists. We participate in technical working groups on pharmaceuticals in the environment sponsored by the industry group Pharmaceutical Research and Manufacturers of America (PhRMA). We are also beginning to study the possible impacts of mixtures of various compounds at extremely low concentrations, which include our pharmaceuticals.

See more on our approach to [pharmaceuticals in the environment](#) on the background pages on our website.

Packaging

We are working to reduce the environmental impact of packaging for our Pharmaceutical and Consumer Healthcare products.

Our Green Packaging Guide provides guidance for evaluating and selecting packaging. It allows designers and managers to benchmark new and existing packaging designs, using five metrics:

- Manufacturing impacts
- Mass of the material
- Biodegradability
- PVC content
- Resource depletion of petrochemical feedstocks

One example of reducing the impact of our packaging is the use of 100% recycled plastic for our *Ribena* bottles. One of challenges of doing this was finding enough recycled plastic. See case study below.

Reverse vending machines

GSK is involved in an innovative project with UK recycling charity Recoup and Imperial College London to increase recycling of empty plastic drinks bottles using reverse vending machines. These look like normal drinks dispensers but there is a crucial difference – they work backwards. After enjoying their drink people can drop the bottle into the machine where it is compacted and then collected for recycling.

Plastic bottles are bulky and difficult to transport. Compacting at source helps to overcome this problem. The machines also prevent the plastic being contaminated with other waste so it is cheaper to process and requires less water for cleaning than plastic recovered from mixed waste recycling units.

Three reverse vending machines were installed at UK shopping centres in 2007 and another machine is planned for 2008.

The success of the scheme relies on people giving back their empties and a discount shopping voucher generated by the machines provides an incentive to take part.

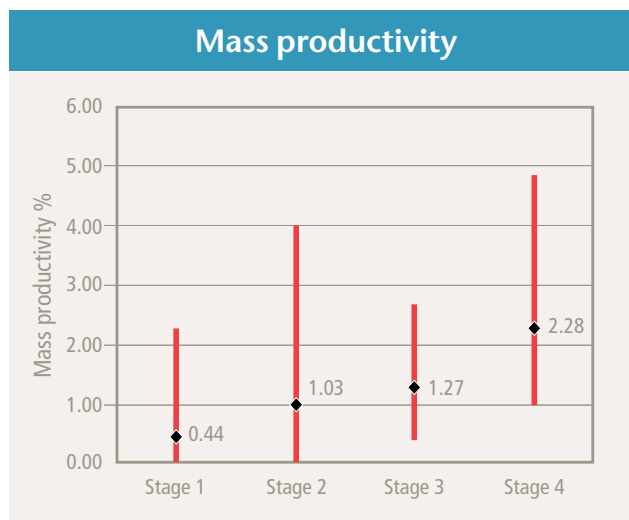
The project is developing a sustainable business model where profits generated from collection of the bottles and the sale of advertising space on the machines are used to buy new machines.

Not only will this create a steady supply of used bottles for recycling, it helps the issue of litter of our bottles which we have seen in the past.

Our performance

Materials efficiency

The chart shows how we improve materials efficiency as compounds move through development stages. In the early stages almost all compounds are less than one per cent materials efficient. By the last stage most achieve more than two per cent and some are above three per cent, with one process achieving productivity of 4.9 per cent.



Key: average

Materials of concern

In 2007, we used 49 metric tonnes of materials of concern, 92 per cent of which was accounted for by four solvents. This was an increase from 2006 as more batches of new products were produced during the year. The solvent waste from this production was destroyed by incineration. We also examined the use of materials of concern across all phases of development. This determined which substances are being used and identified how they can be replaced during development.

Water

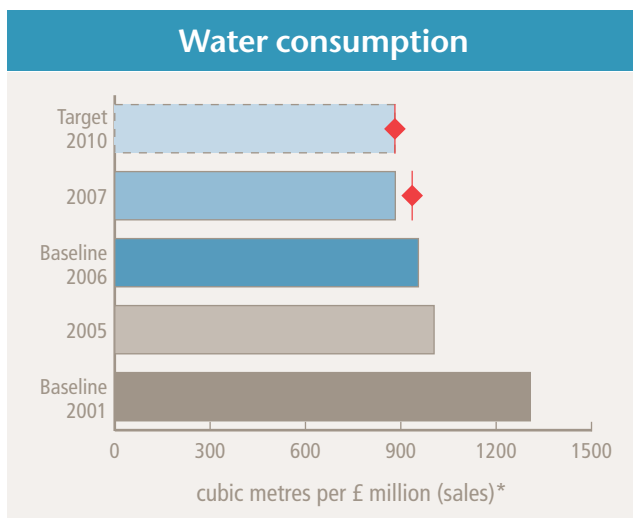
Clean water is a valuable resource that needs to be conserved and protected from pollution.

Our approach

GSK uses water in manufacturing (for processes, products, cooling and cleaning) and for general site uses including drinking, food services and sanitation. Sites that manufacture active pharmaceutical ingredients use large amounts of water while R&D sites and offices use less.

Our water standard requires sites to minimise water use, re-use water whenever feasible and ensure that all wastewater is treated and discharged in a way that minimises adverse environmental impacts. Our target is to reduce water consumption by two per cent per annum per unit of sales.

Our performance



Key:

- ◆ Target
- Current data
- Historical data

Water consumption	
Year	m ³ per £ million (sales)*
2001	1307.5
2005	1004.7
2006	955.3
2007	882.7

*Targets and performance normalised by sales are based on a constant exchange rate.

In 2007, we used 20.9 million cubic metres of water, 5.8 per cent less than in 2006. Water consumption per unit of sales was 7.6 per cent lower than in 2006, exceeding our target of a two per cent decrease. Most of this reduction was achieved through maintenance at facilities and process changes.

Smaller improvements were achieved through ongoing conservation measures, particularly at water-stressed locations. For example our pharmaceutical manufacturing plant in Boronia, Australia, located in a water-stressed area, has an on-going campaign to save water. Since 2001 they have reduced water usage by 33 per cent while increasing production by 22 per cent and staff by 30 per cent, saving an average of 29 million litres of water a year. These water savings are accomplished by recovering wastewater and using it in cooling towers, amenities and maintenance, by capturing storm water and by communicating with employees about saving water.

Wastewater

Our approach

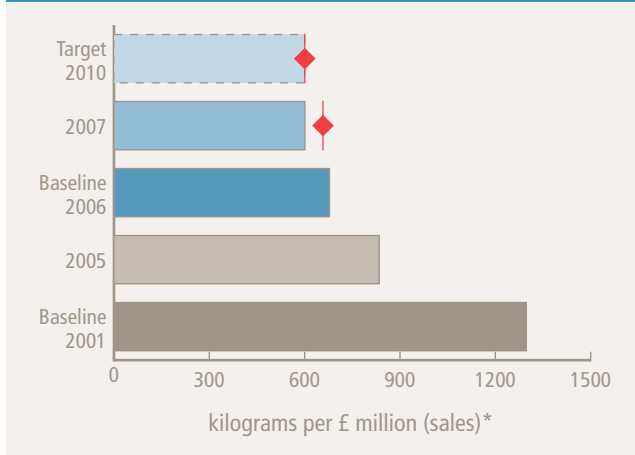
Most sites discharge wastewater to municipal treatment facilities. Some large sites, especially primary manufacturing, have their own on-site wastewater treatment systems. Some sites are permitted to discharge wastewater direct to the sea.

We assess the quality of wastewater by measuring the chemical oxygen demand (COD) – the oxygen required to chemically oxidise compounds in the water. The lower the COD, the cleaner the water.

Our target from 2006 is to improve COD levels by three per cent a year per unit of sales. The vast majority of COD comes from manufacturing. Therefore our data cover mainly wastewater from manufacturing processes but do not include all wastewater from 'domestic' activity such as washrooms and canteens.

Our performance

Chemical oxygen demand of wastewater



Key:
 ◆ Target
 ■ Current data
 ■ Historical data

Chemical oxygen demand of wastewater	
Year	kg per £ million (sales)*
2001	1296.7
2005	843.3
2006	678.2
2007	600.8

*Targets and performance normalised by sales are based on a constant exchange rate.

Any errors found in data from prior years are corrected so data may vary slightly from earlier reports.

We generated 11.8 million cubic metres of wastewater in 2007, about the same as 2006. Total chemical oxygen demand (COD) discharged after on-site treatment was 14.2 million kilograms, 9.7 per cent less than in 2006. The reduction in COD per unit of sales was 11.4 per cent.

The annual chemical oxygen demand of wastewater is linked to the type of products made in a year. In 2007 we stopped or decreased production of some products that create wastewater streams with significant COD.

Waste

Our production, research and sales activities all produce waste:

- Production – hazardous wastes such as solvents and other chemicals
- R&D and quality laboratories – small amounts of chemicals including products and intermediates, as well as broken glassware and plastics

- Offices – paper and other standard commercial waste
- Building renovations produce non-routine waste such as obsolete equipment, office furniture and structural materials

We classify waste as hazardous, non-hazardous, and non-routine (for waste such as construction and demolition rubble). A significant proportion of our waste is classified as hazardous because it contains solvents and chemicals used to manufacture active pharmaceutical ingredients. Other hazardous waste we produce includes lubricants, fluorescent lights and carcasses of animals used in research.

Most non-hazardous waste is general material such as office waste paper, kitchen waste and non-hazardous substances used in manufacturing. A very small part is biological waste that has been treated so it is not hazardous.

Our approach

We aim to eliminate waste where we can, reduce it if we cannot eliminate it, re-use materials if possible, recycle other waste and dispose of any remaining material sensitively.

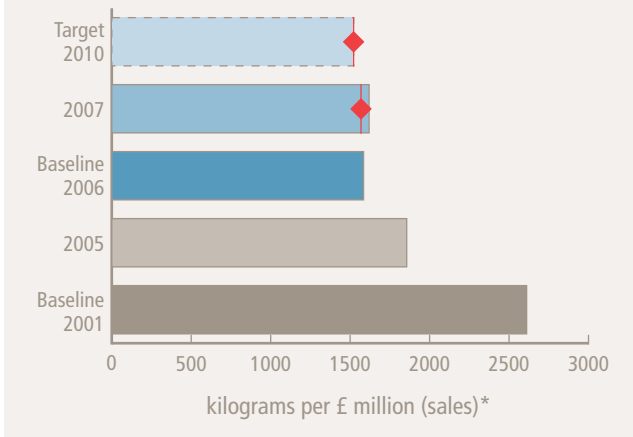
We separate hazardous wastes. Regulations vary widely around the world, but our first choice for solvents (which account for most of our hazardous waste) is to re-use or recycle material. Some solvent is purified on site and reused in the original manufacturing process and some is sold to commercial reprocessing companies (also included in our recycling statistics). When this is not possible solvents are mostly incinerated and the energy recovered wherever possible.

We require disposal contractors to comply with our EHS requirements and local regulations. Sites audit their waste contractors or hire consultants to carry out the audits.

Our target is to reduce non-hazardous waste disposed per unit of sales by one per cent per annum. We have not set a target for reduction of hazardous waste but our target to improve material efficiency (the efficiency with which we convert raw materials to finished products) is designed to reduce hazardous waste (see [page 86](#)).

Our performance

Non-hazardous waste disposed



Key:
 ◆ Target
 ■ Current data
 ■ Historical data

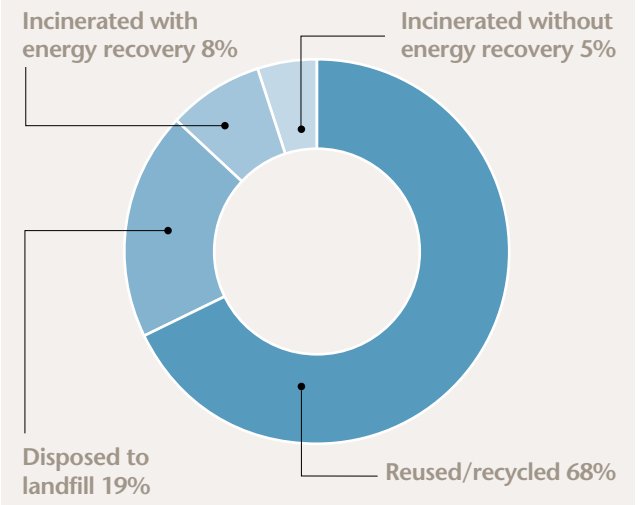
Non-hazardous waste disposed

Year	kg per £ million (sales)*
2001	2610.7
2005	1855.9
2006	1584.4
2007	1619.4

*Targets and performance normalised by sales are based on a constant exchange rate.

Any errors found in data from prior years are corrected so data may vary slightly from earlier reports.

Destination of non-hazardous waste 2007



In 2007, we generated 120.1 million kilograms of non-hazardous waste, compared to 113.8 million kilograms in 2006. Of this 68.1 per cent was recycled and 31.9 per cent was disposed of via landfill or incineration. The amount disposed per unit of sales increased by 2.2 per cent compared to 2006.

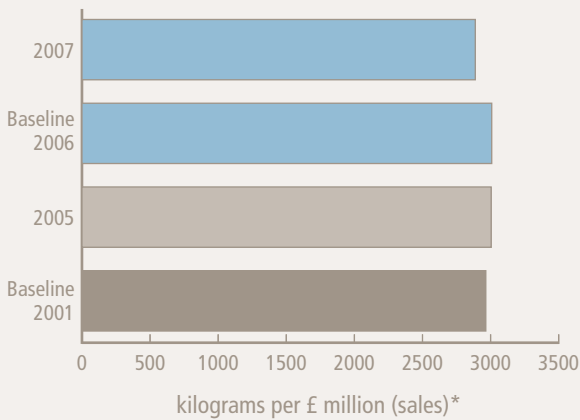
We reduced disposal of non-hazardous waste at our pharmaceutical manufacturing sites by 4 per cent and by 12 per cent at our pharmaceutical R&D sites. However there was an 83 per cent increase in non-hazardous waste disposal in our vaccines business due to expansion. For example, increased production of our flu vaccine resulted in more waste from chicken eggs.

These data do not include non-routine waste such as construction and demolition rubble and similar material not related to day-to-day operations.

We continue to look for ways to reduce waste and have undertaken waste management reviews at many sites.

Recycling non-hazardous waste such as paper, cardboard, glass, plastic or aluminium, usually means sending it for reprocessing so it can be reused to make new products. Two sites in India have stopped putting the coal ash they generate on site in landfill; instead they sell it as raw material for the production of construction material. In addition, three nutritional drink manufacturing sites send some of their process wastes (barley husk) for use in animal food while others recycle canteen waste or effluent treatment plant sludge by converting it into bio-compost.

Hazardous waste disposed



Key:

■ Historical data ■ Current data

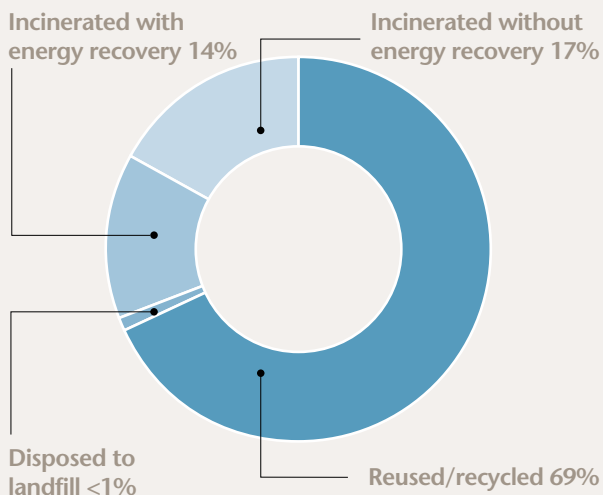
Hazardous waste disposed

Year	kg per £ million (sales)*
2001	2964.8
2005	3004.1
2006	3008.3
2007	2887.6

*Targets and performance normalised by sales are based on a constant exchange rate.

Any errors found in data from prior years are corrected so data may vary slightly from earlier reports.

Destination of hazardous waste 2007



In 2007, we generated 218.4 million kilograms of hazardous waste, compared to 240.8 million kilograms in 2006. The amount disposed per unit of sales was 4.0 per cent lower than 2006. Of this 68.7 per cent was recycled, 0.3 per cent was disposed of via landfill and 31.3 per cent was incinerated (with energy recovered from 45.5 per cent of this). Hazardous waste was mostly solvents (92.7 per cent), the rest being general site waste.

Disposal of hazardous waste is affected by the way solvents are managed and by the mix of products that are made in the year.

Most hazardous waste comes from primary production activity, and this is where we concentrate our efforts. We do not collect hazardous waste data from consumer manufacturing plants, laboratories and offices which we estimate would produce about an additional three per cent of our hazardous waste.

Remediation

In the past, some waste and chemicals handling practices contaminated land and groundwater. These practices are no longer followed, however we are continuing to clean up these sites to deal with health and environmental hazards. GSK and its heritage companies have spent more than £100 million cleaning up more than 50 sites in the US over the last 20 years. We are continuing to clean up 25 of these sites. Most of them are waste disposal sites where GSK is one of several responsible parties. These figures are not included in the data verification.

Ozone depletion

The ozone layer in the upper atmosphere is essential to human survival because it filters out harmful ultra-violet rays from the sun. It has been damaged by ozone depleting substances (ODSs), mainly chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and halons.

Our approach

Our main use of ODSs in the past was as the propellant gas in metered dose inhalers (MDIs) for asthma sufferers. The gas is released when patients use the inhalers and a small amount escapes during production. Previously we used CFCs, but we have been switching to hydrofluoro-alkanes (HFAs) and dry powder technology which does not require a propellant. HFAs do not deplete the ozone layer but do contribute to climate change (see [page 80](#)).

The Montreal Protocol bans the production of CFCs but it exempts a number of 'essential uses' which include MDIs. We plan to eliminate the use of CFCs from our worldwide product portfolio by 2010. Only two per cent of GSK inhalers now contain CFCs.

We have stopped using CFCs in the US and the European Union and offer a selection of alternatives in most other countries. We plan to cease manufacturing of CFC inhalers in China in 2008 and will eliminate all CFCs from our products worldwide by the end of 2010.

The main alternative propellant used is HFA 134a. This does not affect the ozone layer but does have high global warming potential, (see [page 80](#)). We have also invested heavily in dry powder delivery systems that do not use CFCs or HFA 134a.

We also use ODSs in some cooling systems and for other ancillary uses at GSK facilities. These are contained inside the systems and are only released in the event of a leak or during maintenance. We have switched to using HFAs, ammonia and hydrocarbons. Ammonia does not contribute to either ozone depletion or climate change and hydrocarbons have a small climate change impact.

Equipment and production

We aim to eliminate CFCs and HCFCs from cooling systems. This is the only way to completely eliminate emissions from equipment. We are focusing on removing larger pieces of equipment from service before the end of 2010.

We do not intend to replace equipment containing less than one kilogram of CFCs or HCFCs. This type of equipment tends to be hermetically sealed and is less likely to leak.

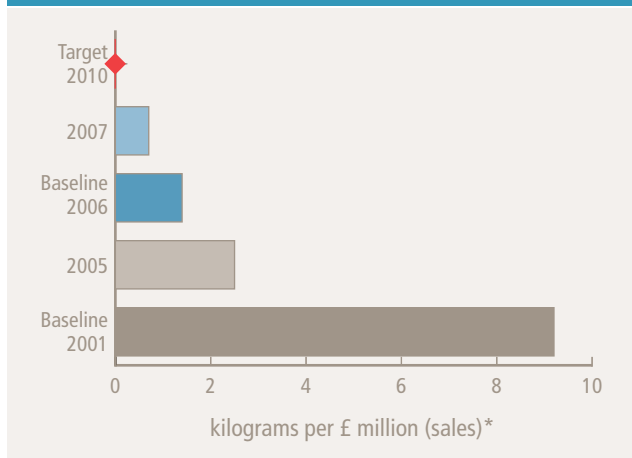
In 2007, 136.5 thousand kilograms of CFC propellant were released when patients used our products. A much smaller amount – 14.9 thousand kilograms – was released during production of inhalers and we estimate that less than one thousand kilograms of CFC-11 equivalent was emitted from equipment.

Ozone depletion potential from patient use of metered dose inhalers was 26.4 per cent lower than in 2006. As production of CFC-containing MDIs decreases, the amount of CFC lost during production also declines.

Ozone depletion potential estimated from equipment and production losses per unit of sales was 0.7 kg per £ million sales, 55.0 per cent lower than 2006. We have 159 pieces of equipment containing CFCs, amounting to 14,151 kilograms in total. Over 5,000 items of equipment contain other ODSs, with an ODP of 4,636 kilograms of CFC-11 equivalent. We estimate (using an estimation factor of 2.75 per cent from the British Refrigeration Association) that 516 kilograms CFC-11 equivalent were released from equipment in 2007.

Our performance

Ozone depletion potential (CFC-11 equivalents⁴)



Key:



Ozone depletion potential

Year	kg per £ million (sales)*
2001	9.2
2005	2.5
2006	1.4
2007	0.7

*Targets and performance normalised by sales are based on a constant exchange rate.

Any errors found in data from prior years are corrected so data may vary slightly from earlier reports.

⁴CFC-11 has an ozone depletion potential of 1

Volatile organic compounds

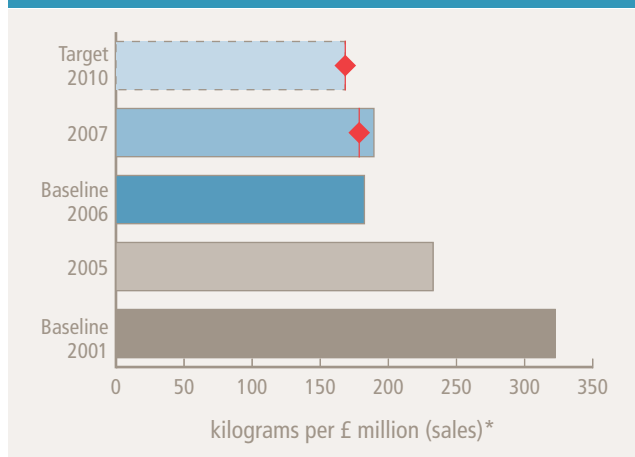
Volatile organic compounds react with nitrogen oxides in the presence of sunlight, creating ozone in the lower atmosphere. This results in smog which is a factor in human respiratory illness. Workplace exposure to certain VOCs can also pose a health risk.

Our approach

We use volatile organic compounds (VOCs) mainly as solvents in our primary manufacturing operations and R&D pilot plants. Solvents are also used to coat some tablets and in cleaning for sterile operations. We also use small quantities in laboratories but do not measure emissions from this use.

Our performance

Volatile organic compound emissions



Key:

- ◆ Target
- Current data
- Historical data

Volatile organic compound emissions	
Year	kg per £ million (sales)*
2001	322.4
2005	232.8
2006	182.4
2007	189.4

*Targets and performance normalised by sales are based on a constant exchange rate.

In 2007, we released 4.5 million kilograms of VOCs to the atmosphere. This was 5.8 per cent higher than in 2006. Emissions per unit of sales were 3.8 per cent higher. Our target from 2006 is to reduce VOCs by two per cent per annum per unit of sales.

VOC air emissions are affected by the management of solvents and by the mix of products that are made in the year. In 2007 some of our primary manufacturing plants made products that required solvents that their solvent recovery equipment could not adequately handle. We continue to look for ways to reduce solvent emissions at sites.

The future

In 2007 we identified 400 energy saving opportunities at many of our sites. A cross-business team has been set up which will manage selection and implementation of these projects in 2008. We expect that results from these improvement projects will not be uniform, but rather dependent on projects that will take time to implement. We are confident that we can meet our climate change targets as these projects begin to deliver energy savings and climate change improvements. In addition to achieving our energy and climate change targets, we will continue to explore ways to reduce the amount of HFAs (powerful greenhouse gases) released from our inhaler products.



Your inhaler products have a large environmental impact. What are you doing about this?

We have been phasing out CFCs from our inhaler products for the last 15 years, replacing these gases with HFAs which have a lower climate change impact (16 per cent that of CFCs). Only two per cent of our inhalers now contain CFCs and we have committed to a complete phase-out by 2010. As part of our new climate strategy, we are exploring ways to reduce the amount of HFAs released from our inhaler products and we are looking into alternative propellants.

We also offer dry powder inhalers for asthma sufferers which contain no greenhouse gases. These are not suitable for all patients, particularly children and the elderly, as they do not contain propellants and rely on a person's lung power for the active ingredients to be administered.

How can the pharmaceutical manufacturing process be made more efficient?

Making medicines is highly regulated and is complicated due to the number of process steps required. We know that there is more we need to do in this area and we have set a target to double the average materials efficiency of manufacturing processes for new products introduced between 2006 and 2010.

Are pharmaceutical residues present in drinking water and are they a risk to humans?

Our studies have shown that GSK pharmaceutical products are either not present in watercourses, or are present at low concentrations. Our risk assessments demonstrate that these concentrations do not pose a risk to human health. But we are not complacent and we continually monitor the latest scientific studies and findings to improve our risk assessment methodology.

External assurance statement



SGS UNITED KINGDOM LTD'S REPORT ON ENVIRONMENT, HEALTH AND SAFETY DATA IN THE GLAXOSMITHKLINE CORPORATE RESPONSIBILITY REPORT FOR 2007

NATURE AND SCOPE OF THE ASSURANCE

SGS United Kingdom Ltd was commissioned by GlaxoSmithKline (GSK) to conduct an independent assurance of the Environment, Health and Safety data in their Corporate Responsibility (CR) Report. The scope of the assurance, based on the SGS Sustainability Report Assurance methodology, included 2007 data contained in pages [80–87](#) and [90–92](#) and the accompanying data tables in pages [97–99](#) of this report.

The information in the GSK CR Report and its presentation are the responsibility of the directors and management of GSK. SGS United Kingdom Ltd has not been involved in the preparation of any of the material included in the CR Report. Our responsibility is to express an opinion on the text, data, graphs and statements within the scope of verification. Financial data drawn directly from independently audited financial accounts has not been checked back to source as part of this assurance process.

The SGS Group has developed a set of protocols for the Assurance of Sustainability Reports based on current best practice guidance provided in the Global Reporting Initiative Sustainability Reporting Guidelines (2006) and the AA1000 Assurance Standard (2003). These protocols follow differing levels of Assurance depending the reporting history and capabilities of the Reporting Organisation.

This report has been assured for content veracity. The assurance comprised a combination of interviews with relevant employees; documentation and record review at GSK locations in UK (London, Tonbridge, Montrose, Coleford, Barnard Castle), USA (Upper Providence, St Louis), Canada (Sainte Foy, Mississauga), South Africa (Cape Town), India (Sonapat), Germany (Dresden), Australia (Port Fairy), Mexico (Xochimilco) and Brazil (Jacarepagua). The sites selected included those that submitted high proportions of key data and included all parts of the GSK business.

STATEMENT OF INDEPENDENCE AND COMPETENCE

The SGS Group of companies is the world leader in inspection, testing and verification, operating in more than 140 countries and providing services including management systems and service certification; quality, environmental, social and ethical auditing and training; environmental, social and sustainability report assurance.

SGS United Kingdom Ltd affirm our independence from GSK, being free from bias and conflicts of interest with the organisation, its subsidiaries and stakeholders. The assurance team was assembled based on their knowledge, experience and qualifications for this assignment, and comprised auditors registered with IRCA, IEMA and EMAS Verifiers.

ASSURANCE OPINION

On the basis of the methodology described and the verification work performed, we are satisfied that the Environment, Health and Safety data contained within the GSK Corporate Responsibility Report 2007 is reliable and provides a fair and balanced representation of GSK's Environment, Health and Safety activities in 2007. We believe that GSK has chosen an appropriate level of assurance for this stage in their reporting.

External assurance statement

Key areas for improvement to data collection, submission and manipulation were identified as follows:

- Although there is a central database for recording EHS data, many sites use spreadsheets to collate data before entry into the database, leading to the possibility of errors in data transfer;
- Some data is collected and submitted by subcontractors with no internal audit or other checking mechanism in place and errors were found in such data;
- There were some instances where no system for collection of certain data existed or where data was not reported, although these were not significant quantities for individual sites;
- Data from ancillary services or site activities was not always included in reported data;
- Some estimated data was not corrected when actual values became available and there was no system in place to ensure this happened.

Improvements identified in previous reporting period have started to be implemented as follows:

- Definitions are instantly available electronically in EHS Manager and were seen to be in use on sites. A revision of documented detailed definitions is currently in progress;
- Estimates continue to be made for certain data and we recognise that this is still necessary and that attempts are being made to determine the most appropriate estimation methods and ensure accuracy in calculations carried out;
- An increasing amount of data is being submitted by sites on a more regular basis, allowing for a more rigorous checking process and the newly established EHS Business Intelligence Report provides for instant up-to-date view of the overall data as well as underlying site-by-site data to track changes and outlying figures more easily;
- Training has been continuing and site visit reports indicated that personnel involved were generally prepared for verification activities and able to provide the necessary information;
- There appeared to have been an increase in the number of comments included alongside data in EHS Manager to provide explanations, however this is still an area for ongoing improvement;
- The EHS Business Intelligence Report extracts data directly from EHS Manager to the Corporate Responsibility Data Table and thereby reduces the possibility of errors occurring from alternative data extraction methods;
- Relevant data was more readily available during external verification process through the use of the EHS Business Intelligence Report.

Key areas for improvement in data verification process were identified as follows:

- Verification audits are planned in the coming reporting year to be undertaken alongside ISO14001 and OHSAS18001 certification audits where possible. Since these visits could occur at any point during the year sites should be encouraged to report data into EHS Manager on a regular monthly basis wherever possible;
- The final verification process would be improved by extending the time period between any site visits and this process to allow for any amendments to data to be completed in advance of the final verification.



Signed:

For and on behalf of SGS United Kingdom Ltd

Pauline Earl
 Managing Director
 20 February 2008
 WWW.SGS.COM

Links

In this report:

- Feedback from the EHS stakeholder panel in [Stakeholder engagement](#)
- Supplier EHS audits, see [Supply chain](#)
- Communicating with employees, see [Employment](#)

In the background section of our website:

- EHS management framework
 - Environmental issues
 - Position papers on:
 - [Energy](#)
 - [Climate change](#)
 - [Hazardous chemical management](#)
 - [Pharmaceuticals in the environment](#)
- www.gsk.com/responsibility/values

Metric	2001	2004	2005	2006	2007
Energy use					
Energy for operations (million gigajoules)	20.7	18.9	19.4	19.2	19.0
Natural gas	9.87	8.69	8.81	9.10	8.91
Fuels	1.40	1.50	1.50	1.07	1.03
Coal	1.04	0.56	0.63	0.47	0.51
Steam imported	0.28	0.17	0.19	0.21	0.19
Electricity imported	8.10	7.98	8.31	8.38	8.40
Energy for transport¹ (million gigajoules)	–	–	–	4.8	5.2
Sales force	–	–	–	2.0	1.8
Air travel	–	–	–	1.5	1.6
Product logistics	–	–	–	1.4	1.9
Climate change impact (CO₂ equivalent)²					
CO₂ equivalents from operations energy (million kilograms)	1,825.3	1,666.6	1,715.9	1,687.9	1,667.5
Natural gas	504.0	443.7	449.9	464.8	455.1
Fuels	86.9	96.0	98.7	73.9	70.6
Coal	93.5	50.2	56.8	42.6	45.4
Steam imported	39.3	11.2	13.8	14.5	13.4
Electricity imported	1,101.6	1,065.5	1,096.7	1,092.2	1,083.0
CO₂ equivalents from transport¹ (million kilograms)	123.0	206.0	233.0	339.9	367.0
Sales force	33.0	78.0	102.0	136.1	123.4
Air travel	71.0	114.0	112.0	105.5	110.0
Product logistics	19.0	14.0	19.0	98.3	133.6
CO₂ equivalents from other production activities (million kilograms)	1,422.9	640.4	563.6	405.3	290.6
Inhaler production losses	1,218.6	491.9	420.3	306.9	215.8
Equipment containing greater than 1kg refrigerant ³	116.86	46.66	46.82	6.99	8.47
CO ₂ , Methane and Nitrous Oxide from production, waste treatment and other sources	87.43	101.86	96.46	91.39	66.25
CO₂ equivalents from use of inhalers by patients⁴ (million kilograms)	–	–	–	4,335	4,530
CFC-11 inhalers	–	–	–	197	145
CFC-12 inhalers	–	–	–	1,083	797
HFC-134a inhalers	–	–	–	3,055	3,589

Footnotes

¹ Energy and climate change impact for travel and transport by air, land and sea is calculated using the GHG protocol starting from distance travelled, not directly from fuel use. In years before 2006 we did not collect all categories of freight transport or employee business travel. In 2007 product transport reporting covered more product transport routes by air, land and sea and employee travel included group air travel originating in the US (which was not included in 2006). Some of the transport data are estimated and we may not capture all routes and employee air travel

² Climate change impact is calculated as CO₂ equivalent using the Greenhouse Gas (GHG) Protocol developed by the World Resources Institute and the World Business Council for Sustainable Development. In 2007 we reviewed all CO₂ factors and updated the data for all years as appropriate. Greatest changes were in updated factors for electricity.

³ Climate change impact from refrigerants released from equipment is calculated using factors from the GHG protocol. We collect data on the amounts of refrigerants contained in the equipment and calculate the releases using a factor from the British Refrigeration Association for probable leakage.

⁴ We did not have enough information to calculate climate change impact from inhaler use before 2006

Metric	2001	2004	2005	2006	2007
Water use and discharge					
Water (million cubic metres)	26.8	20.9	21.8	22.2	20.9
Municipal	15.20	12.77	12.82	12.87	12.26
Wells or boreholes	11.56	7.96	8.59	8.95	8.29
Other water ⁵	0.04	0.14	0.35	0.37	0.35
Wastewater volume⁶ (million cubic metres)	14.9	13.3	13.1	11.7	11.8
WW to recycling	0.22	1.15	0.62	0.62	0.58
WW to municipal sewer	5.35	5.26	5.52	5.06	5.77
WW to water bodies	9.34	6.87	7.00	6.05	5.45
COD after on-site treatment^{6,7} (million kilograms)	26.6	19.5	18.3	15.8	14.2
COD in recycled water	<.01	<.01	<.01	<.01	<.01
COD to municipal sewer	5.39	5.07	4.47	3.93	4.02
COD to water bodies	21.17	14.47	13.79	11.83	10.20
Waste generated and disposed					
Hazardous waste generated⁸ (million kilograms)	348.7	253.0	258.7	240.8	218.4
Hazardous waste recycled	287.91	182.38	193.68	170.93	150.03
Hazardous waste disposed	60.75	70.60	65.07	69.87	68.36
Hazardous waste incinerated with energy recovery ⁹	28.52	35.92	29.40	30.01	30.88
Hazardous waste incinerated with no energy recovery	29.09	32.94	34.30	39.36	36.92
Hazardous waste to landfill	3.13	1.74	1.37	0.50	0.57
Non-hazardous waste generated (million kilograms)	132.8	148.2	124.0	113.7	120.1
Non-hazardous waste recycled	79.34	103.99	83.82	76.98	81.73
Non-hazardous waste disposed	53.49	44.19	40.20	36.80	38.34
Non-hazardous waste incinerated with energy recovery ⁹	5.92	7.33	8.69	8.77	9.34
Non-hazardous waste incinerated with no energy recovery	12.05	9.42	7.79	6.24	5.90
Non-hazardous waste to landfill	35.52	27.45	23.73	21.79	23.10
Non-routine waste generated¹⁰ (million kilograms)	25.3	13.7	77.9	27.2	37.4
Non-routine waste recycled	2.29	6.80	39.97	11.10	23.03
Non-routine waste disposed	22.98	6.94	37.96	16.12	14.37
Non-routine waste incinerated with energy recovery ⁹	1.55	0.14	7.46	2.59	4.22
Non-routine waste incinerated with no energy recovery	0.24	0.20	0.39	0.72	0.74
Non-routine waste to landfill	21.19	6.60	30.12	12.81	9.42

Footnotes

⁵ Water from other sources includes recycled sources

⁶ We focus collection of wastewater and chemical oxygen demand data primarily on the major contributors; primary manufacturing operations, pilot plants, coating activities and sterile operations. Some sanitary waste streams are included if they cannot be separated from production wastewater streams or if they are significant

⁷ Chemical oxygen demand (COD), a measure of water pollution, is measured when the wastewater leaves our sites following any onsite treatment

⁸ We consider a waste to be hazardous if it is radioactive, bioengineered or biohazardous, or if it has any of the properties defined by the 1989 Basel Convention.

This includes flammability, explosivity, water or air reactivity, corrosivity, oxidising potential, acute or chronic toxicity, ecotoxicity or infection. Biological waste rendered non-hazardous after treatment is considered a non-hazardous waste. We focus collection of hazardous waste on the major contributors; primary manufacturing operations, pilot plants, coating activities and sterile operations

⁹ Incineration with energy recovery means burning the material and using the resulting energy

¹⁰ Non-routine waste includes construction and demolition rubble and is not included in hazardous or non-hazardous waste calculations

Metric	2001	2004	2005	2006	2007
Volatile organic compound emissions					
Volatile organic compound emissions¹¹ (million kilograms)	6.6	5.3	5.0	4.2	4.5
Top five solvents released (million kilograms)					
Acetone	1.23	1.11	1.15	1.03	0.93
Dichloromethane	1.73	0.96	0.87	0.85	0.74
Ethanol	0.28	0.53	0.46	0.44	0.62
Methanol	0.74	0.67	0.71	0.44	0.60
Toluene	0.41	0.19	0.06	0.09	0.26
Ozone depleting substances¹²					
ODS releases from production (thousand kilograms)	183.5	58.9	51.0	32.9	14.9
CFC-11 releases from production	88.55	12.63	14.11	19.35	3.22
CFC-12 releases from production	94.90	46.30	36.86	13.5	11.63
Ozone depletion potential of refrigerants released from equipment (thousand kilograms CFC-11 equivalent)					
CFC-11 releases from equipment	0.56	0.93	1.62	0.42	0.37
CFC-12 releases from equipment	0.33	0.31	0.21	0.02	0.02
Other ODS from equipment	3.42	1.97	1.41	1.15	0.20
ODS releases from patient use of inhalers¹³ (thousand kilograms)					
CFC-11 from patient use	–	–	272.5	185.6	136.5
CFC-12 from patient use	–	–	196.38	133.72	98.35
ODP of refrigerants contained in equipment¹⁴ (thousand kilograms CFC-11 equivalent)					
	–	–	–	23.40	18.79
Estimated costs and investments					
Operations and maintenance cost (million £)	41.5	43.2	39.3	33.6	31.1
Capital investment (million £)	24.4	9.5	12.1	9.7	16.5

Footnotes

¹¹ We focus collection of volatile organic compound emissions on the major contributors; primary manufacturing operations, pilot plants, coating activities and sterile operations

¹² Ozone depletion potential (ODP) from ozone depleting substances is calculated using factors from the Montreal protocol

¹³ Before 2006 we did not have information about inhalers produced in Asia so it was not included in ODP or GWP calculations until 2006

¹⁴ Before 2006 we did not have information about the amounts of refrigerants contained in equipment