Environment Agency

nuclear sector plan

2006 Environmental Performance Report

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The Environment Agency. Out there, making your environment a better place.

Published by:

Environment Agency
Rio House
Waterside Drive, Aztec West
Almondsbury, Bristol BS32 4UD
Tel: 0870 8506506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

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foreword

The environmental performance of the sectors we regulate matters to us. The Nuclear Sector Plan was drawn up in discussion with the nuclear industry and was one of the first plans we published. It sets out environmental objectives that we have agreed with the industry, and how progress towards these might be measured. We are pleased that the industry has embraced this plan, which includes voluntary activities that go beyond regulatory requirements.

The nuclear industry is undergoing rapid change. The Government's recent White Paper on the future of nuclear power concluded that nuclear should have a role to play in the future generation of electricity; Government and the Nuclear Decommissioning Authority (NDA) are mapping out an approach for the geological disposal of higher activity radioactive waste. The NDA is reorganising the established civil nuclear industry and seeking to drive innovative approaches to site decommissioning and clean up.

We expect high environmental standards to be achieved throughout all this work. We will be looking for world class environmental performance from any new nuclear power stations that are built. At the same time we will be urging those involved in dealing with our national nuclear legacies to make progress in delivering decommissioning and clean-up of sites, whilst simultaneously protecting the environment. By working together in partnership we can deliver these challenging goals.

We will soon be reviewing this plan to update its scope and objectives in the light of these changes and the challenges they bring. We will also take care to build on our experience in using the plan to date.

Tricia Henton / Environment Agency

summary

This report describes the environmental performance of the nuclear sector in England and Wales during 2006, measured against the objectives and performance indicators set out in the **Nuclear Sector Plan**.

The Nuclear Sector Plan was developed in discussion with the nuclear industry. It sets out environmental objectives and indicators of performance that we and the industry have agreed. These cover statutory responsibilities, but go further by including voluntary activities the industry has agreed to undertake. The plan also addresses areas where we have agreed to improve our work as an environmental regulator. We are pleased that the industry is supporting the sector plan and has agreed to use the plan to monitor and report on the impact of its activities.

Overall, the environmental performance of the sector was very good during 2006, with improvements over previous performance being made in a number of areas. Of course, we will need to monitor performance over a number of years to identify trends. Here, we highlight how the sector performed against its eight main environmental objectives, where there are still areas for improvement, how environmental performance in the nuclear sector compares with other sectors, and how we intend to use this information in the future.

Natural resource usage reduced

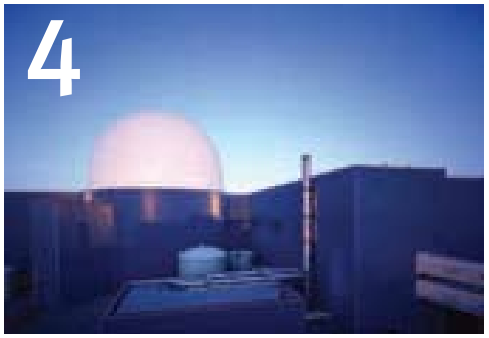
➜ Sites used less water and energy than in 2005. The nuclear sector used a total of 15.7 million cubic metres of water, that's four per cent less than in 2005. It also used 27,080 TJ (7.5 TWh) of energy, a one per cent reduction on the previous year.

More waste produced but being managed

➜ Progress with packaging intermediate level radioactive waste (ILW) varied from site to site, with Sellafield, Trawsfynydd and Windscale all making good progress. Nevertheless packaging radioactive wastes into a form fit for long term storage and ultimate disposal is a significant future challenge for the industry. The sector produced a total of 257,000 tonnes of non-radioactive waste in 2006, more than in the previous year, although a significant proportion of this was from decommissioning activities. Over 75 per cent of this waste was classed as inert. Integrated waste strategies were in place at 73 per cent of nuclear sites.

Progress towards meeting targets for discharges to air and water

➜ Reducing liquid radioactive discharges to meet the UK radioactive discharge strategy targets is one of the main environmental challenges facing the nuclear sector. Good progress is being made. Sellafield met a challenging target of reducing technetium-99 discharges from 190 terabequerels (TBq) in 1995 to less than 10 TBq/year by the end of 2006. This was achieved by the introduction of changes made as a result of requirements we imposed. The general trend in recent years has been for discharges to reduce. Some discharges increased in 2006 following the return from outage of plant at Sellafield, and due to increased output at some Magnox power stations.



Contribution to reducing greenhouse gases

➜ The nuclear sector releases a relatively small amount of greenhouse gases into the environment. In 2006, the sector generated 18 per cent of the UK's electricity and released greenhouse gases equivalent to 0.6 million tonnes of carbon dioxide. If this amount of electricity had been generated using fossil fuels, something like an extra 40 million tonnes of carbon dioxide emissions would have been generated.

Images courtesy of: 2 Nuclear Decommissioning Authority/Sellafield Ltd, 3 Springfields Fuels Ltd, 4 British Energy

Working to restore sites and develop biodiversity action plans

➜ Operators reported that 90 per cent of nuclear sites need a contaminated land management plan. These cover both work to characterise contamination on sites and, if merited, to remediate contamination found; 89 per cent of these sites already had some arrangements in place in 2006. 70 per cent of sites had implemented biodiversity action plans (BAPs) by the end of 2006, a voluntary initiative being taken forward under this sector plan.

Links between the industry, regulators and stakeholders working well

➜ Good progress is being made to improve involvement and understanding between nuclear sites, the Environment Agency and other interested organisations. All nuclear sites hold some form of regular stakeholder local liaison meeting. 83 per cent of operators published their own environmental report in 2006.

Increasing awareness of product stewardship

➜ There are some examples of good practice in relation to product stewardship within the nuclear industry. For example, several sites already assess the environmental performance of their suppliers, and we encourage the industry towards wider adoption of good practice.

Improvements in regulatory and environmental management systems

➜ Modern multi-media authorisations for disposing of radioactive waste were in place at 70 per cent of nuclear sites by the end of 2006 and there were no serious pollution incidents or serious breaches of permits in the sector during this year.

Images courtesy of: 7 Sellafield Ltd, 8 Sellafield Ltd

Nuclear performs well against other sectors

The performance report for 2006 showed that in a number of key areas the environmental performance of the nuclear sector was good in relation to other industry sectors. The sector is using fewer resources, greenhouse gas emissions are small, discharges of pollutants to the environment are generally falling or remaining the same and there were no serious pollution incidents or serious breaches of permits.

Areas for improvement

Although overall environmental performance of the nuclear sector was good in 2006, there are areas on which it needs to focus its attention in order to further improve performance, in particular:

- making better use of resources at some sites, particularly those sites that can update infrastructure and management systems;
- packaging and conditioning intermediate level radioactive waste in a form suitable for disposal;
- sharing best practice on recycling conventional waste within the nuclear sector and learning from other sectors;
- continuing to make good progress in reducing discharges by applying 'best practicable means' (BPM), and making progress towards meeting all of the UK strategy targets for radioactive discharges;
- making progress in delivering improvements in integrated waste management as set out in 'integrated waste strategies' (IWS) drawn up for individual sites, and developing a national waste strategy that builds on this work;
- operators and us to track and share numbers of lower categories of incidents and breaches to provide early warning of trends.

We will develop an RSR Operator Performance and Risk Appraisal (OPRA) scheme, and use this to develop performance measures for environmental management systems.

Moving forward

We will use these results as a base for future reports, as well as for reviewing the Nuclear Sector Plan in 2008. The review will make sure that we continue to work together to improve the environmental performance of the sector as it addresses the major challenges ahead.

Feedback

This is the first public report of performance against the Nuclear Sector Plan objectives. We would welcome your views on the content or format of the report. If you have any queries or wish to make any comments, please contact David Bennett – **david.bennett@environment-agency.gov.uk**

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Introduction

The nuclear sector

The ‘nuclear sector’ refers to sites which are licensed by the Nuclear Installations Inspectorate (NII) under the Nuclear Installations Act (1965), or sites that would be licensed if the Act applied to the Ministry of Defence. There are about 30 nuclear licensed sites in England and Wales. Other sites (including hospitals and universities) also produce radioactive waste, but not in such significant quantities.

The nuclear sector is diverse. Nuclear sites cover a wide range of operations and products that can be broken down into seven sub-sectors. Following the establishment of the Nuclear Decommissioning Authority (NDA) in 2005, there has been some restructuring of the civil nuclear industry. The sub-sectors, companies and sites are listed below, together with any new site licence company (SLC) names.

Sub-sector	Company	Sites	New SLC name
Electricity generation	Magnox Electric Ltd (MEL)	Dungeness A [a] Hinkley Point A [a] Sizewell A [a] Bradwell [a] Berkeley [a]	Magnox South Ltd (to take effect during 2008) [b]
		Wylfa Trawsfynydd [a] Oldbury	Magnox North Ltd (to take effect during 2008) [b]
	British Energy (BE)	Dungeness B Heysham 2 Hartlepool Hinkley Point B Heysham 1 Sizewell B	No change
Fuel reprocessing	British Nuclear Group Sellafield Ltd (BNGSL)	Sellafield	Sellafield Ltd (this took effect in 2007) [b]
Fuel fabrication and enrichment	British Nuclear Group Sellafield Ltd (BNGSL)	Capenhurst [a]	Sellafield Ltd (this took effect in 2007) [b]
	Urenco (Capenhurst) Ltd	Capenhurst	No change
	Springfields Fuels Ltd	Springfields	No change
Research	United Kingdom Atomic Energy Authority (UKAEA)	Harwell [a] Winfrith [a]	Research Sites Restoration Ltd (RSRL) (to take effect in 2008) [b]
		Windscale [a]	To be part of Sellafield Ltd, Sellafield site (to take effect in 2008) [b]
Defence	Ministry of Defence (MoD)	HMNB Devonport Devonport Royal Dockyard BAE Barrow RRMPOL Derby	No change
	Atomic Weapons Establishment (AWE)	Aldermaston Burghfield	No change
Medical and bioscience research and products	GE Healthcare (GEH)	Amersham (Grove Centre) Cardiff (Maynard Centre)	No change
Waste management	British Nuclear Group Sellafield Ltd (BNGSL)	LLWR at Drigg	LLW Repository Ltd (this took effect in 2007) [b]

a) Decommissioning sites (Dungeness A and Sizewell A operated during 2006, closing at the end of that year).
b) Changes as a result of NDA industry re-structuring and competition.

Sector plans

We, the Environment Agency, want to encourage businesses in England and Wales to look after the environment and help achieve our vision and corporate goals. Our corporate strategy for 2006-11, **'Creating a better place'**, sets out how we will promote the goal of 'a greener business world' and why businesses need to have environmental concerns at the heart of their thinking.

One way of working towards this goal is by producing sector plans. These are joint ventures between ourselves and different industry sectors. Each plan includes a brief overview of key environmental, economic and social issues which influence the sector. It describes how well the sector is doing environmentally and identifies how it can improve. The plans propose environmental priorities, objectives and indicators of performance, typically covering the next five to fifteen years. The plans have actions for both industry and for us. Some actions can be enforced by regulations, whilst others are voluntary.

The purpose of sector plans is to:

- focus on the most significant risks and impacts that the sector poses to the environment;
- bring about improvements in the sector's environmental management and performance;
- prioritise and target our effort within and across sectors;
- achieve greater environmental benefits by co-operating with sectors than we could through regulation alone;
- monitor progress in bringing about environmental improvements, within and between sectors;
- benchmark performance between different operators within the sector.

We published the first three sector plans in November 2005. These were for the cement, nuclear and chemicals sectors. Since then, we have produced sector plans for dairy farming and the waste management industry. We are currently developing plans for dairy manufacturing, power generation and water.

We are pleased that the industry is supporting the sector plan and has agreed to use the plan to monitor and report on the impact of its activities.

2006 performance

The Nuclear Sector Plan includes eight environmental objectives. These are:

1 **reduce the consumption of natural resources;**

2 **minimise and manage solid waste;**

3 **reduce discharges to air and water;**

4 **reduce greenhouse gas emissions;**

5 **develop site restoration and biodiversity action plans;**

6 **improve transparency, understanding and engagement between the Environment Agency, industry and other stakeholders;**

7 **promote product stewardship and wider supply chain benefits;**

8 **work to risk-based regulatory and environmental management systems.**

Each objective has a number of associated performance indicators.

This report details performance against the indicators in the Nuclear Sector Plan for 2006. It compares nuclear with other sectors where data is available, and compares this year's performance with last year's performance if appropriate (information was gathered for 2005 for trial purposes, but was not reported). We also consider where the sector needs to improve its environmental performance, and report on progress with tasks and milestones which were due to be completed during 2006.

Operators reported data against each performance indicator for each of their sites, apart from the Ministry of Defence (MoD) where one response covered the four sites involved in activities related to the nuclear submarine propulsion programme.

The data is considered at a sub-sector or company level in this report, as appropriate. For example, data on radioactive discharges is presented by sub-sector because the UK discharge strategy specifies targets for each sub-sector, while information on environmental reporting is presented at a company level. Site-level data is also included for illustration, for example the five sites using most water or with the highest critical group dose, or to compare year-on-year performance.

Several of the indicators are 'developmental'. This means that, although the indicator was proposed when the Nuclear Sector Plan was written, a workable definition had not been developed. In a small number of cases, we have found that performance indicators that were included in the Nuclear Sector Plan are impractical or of very limited value. We have not reported against these indicators and will remove them when we review the sector plan in 2008.

Significant events in 2006

Several events in 2006 had a significant impact on the environmental performance of the nuclear sector:

- Major construction or decommissioning projects were underway at several nuclear sites. For example, the low level active facility at Berkeley was closed and construction of an intermediate level waste store started, the cooling water pump-house at Bradwell was demolished, the turbine hall at Hinkley Point A was deplanted, a laser facility was being built at Aldermaston and the safety review projects at Wylfa were completed. Several of these projects produced large amounts of non-radioactive waste.
- The uranium ore processing operations at Springfields shut down. This resulted in a significant decrease in radioactive discharges in line with the UK discharge strategy.
- The Nuclear Decommissioning Authority (NDA) owns the civil nuclear sites. Restructuring of the civil nuclear industry started in 2006 to support the NDA's competition programme. More information on this programme is available from **www.nda.gov.uk**.
- Two Magnox power stations – Sizewell A and Dungeness A – shut down at the end of the year.

Objective 1

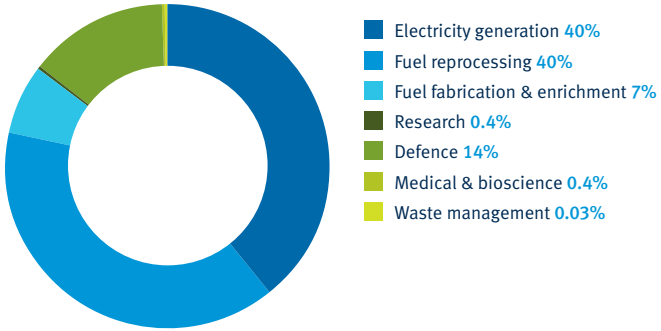
Reduce consumption of natural resources

1.1 Water use (excluding cooling water)

Key messages

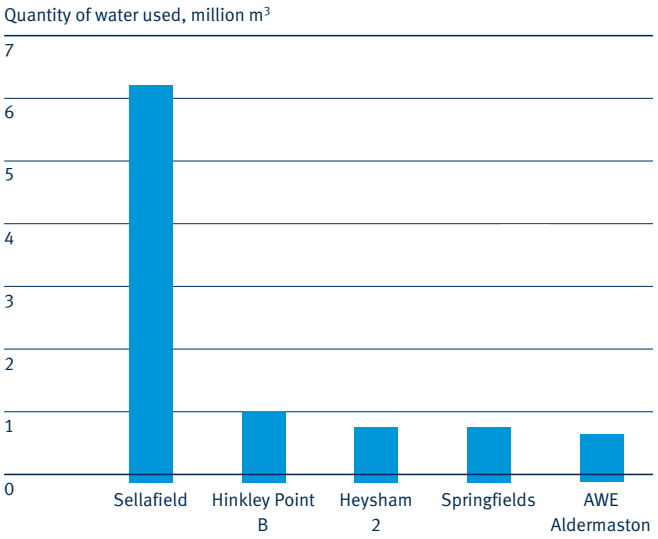
- The nuclear sector used 15,700,000 m^3 of water in 2006 – four per cent less than in 2005.

Figure 1: **Water consumption by sub-sector**



- Fuel reprocessing at Sellafield accounted for 40 per cent of the water used by the nuclear sector. The electricity generation sub-sector consumed a similar amount, with British Energy using almost twice as much water as Magnox Electric. Defence activities were the only other major user. The research, biomedical and waste management sub-sectors all used less than 0.5 per cent of the sector total.
- Sixteen sites (53 per cent) reduced the amount of water they used in 2006, compared with 2005. Trawsfynydd and Aldermaston achieved the largest savings (40 per cent and 38 per cent respectively). At Trawsfynydd, this was largely due to the completion of concrete and boiler cutting projects where water was used as a lubricant and coolant. AWE completed infrastructure improvements at the Aldermaston site in 2006. These have reduced the amount of water used by one million cubic metres compared to 2005.

Figure 2: **Sites with highest water consumption**



- Seven sites (23 per cent) used more water than in 2005. With three exceptions, these increases were relatively minor (less than 10 per cent).
- Ten nuclear sites (33 per cent) consumed less than 100,000 m^3 of water in 2005. Together, they used around 200,000 m^3, or 1.3 per cent of the sector total.

1.2 Energy use

The nuclear sector is a net producer of energy. In 2006, the ten nuclear power stations still operating in England and Wales produced a net total of 212,000 TJ (59 TWh) of electricity which was fed into the national grid – British Energy generated 153,000 TJ and Magnox Electric generated 59,000 TJ. Nuclear power stations produced 18 per cent of the total electricity generated in the UK in 2006.

Key messages

- The nuclear sector also uses energy in the fuel cycle and other industrial processes, in commercial and industrial buildings, and for transport. Energy used may be in the form of electricity, gas, oil or diesel.
- The nuclear sector used 27,080 TJ (~7.5 TWh) of energy in 2006 – one per cent less than in 2005. This figure does not include all energy consumed in transporting materials, product and wastes in the nuclear sector, although this is estimated to be only a minimal amount.
- Electricity generation activities accounted for over 75 per cent of the energy consumed by the nuclear sector, with most of this being used by the reactor coolant gas circulators. British Energy was the major consumer, accounting for 54 per cent of the sector total, with Magnox accounting for 22 per cent.
- At a site level, Heysham 2 and Wylfa remained the biggest energy users. These two sites together accounted for over 25 per cent of the total energy used by the nuclear sector. Energy use at Wylfa decreased by 17 per cent compared to 2005, in line with electricity generation, which reduced because the reactor and other plant was shut down for maintenance. At Heysham 2, energy use increased by six per cent compared to 2005, although power output only increased by one per cent.
- Seventeen sites (57 per cent) reported using less energy in 2006, compared with 2005, while six sites (20 per cent) used more. Berkeley achieved the biggest reduction in energy use (29 per cent). This was partly because no decommissioning activity was taking place on the site, and partly because improved building management systems were introduced. Energy use at Heysham 1 increased by 19 per cent between 2005 and 2006, in line with increased electricity production

Figure 3: **Energy consumption by sub-sector**

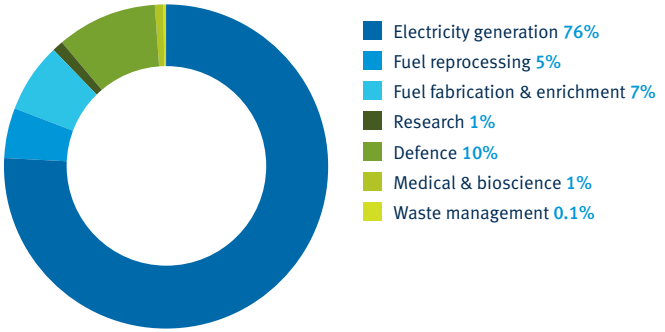
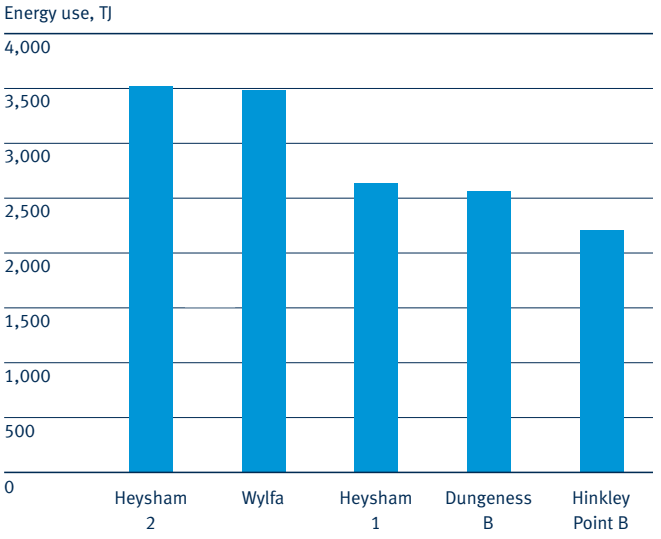
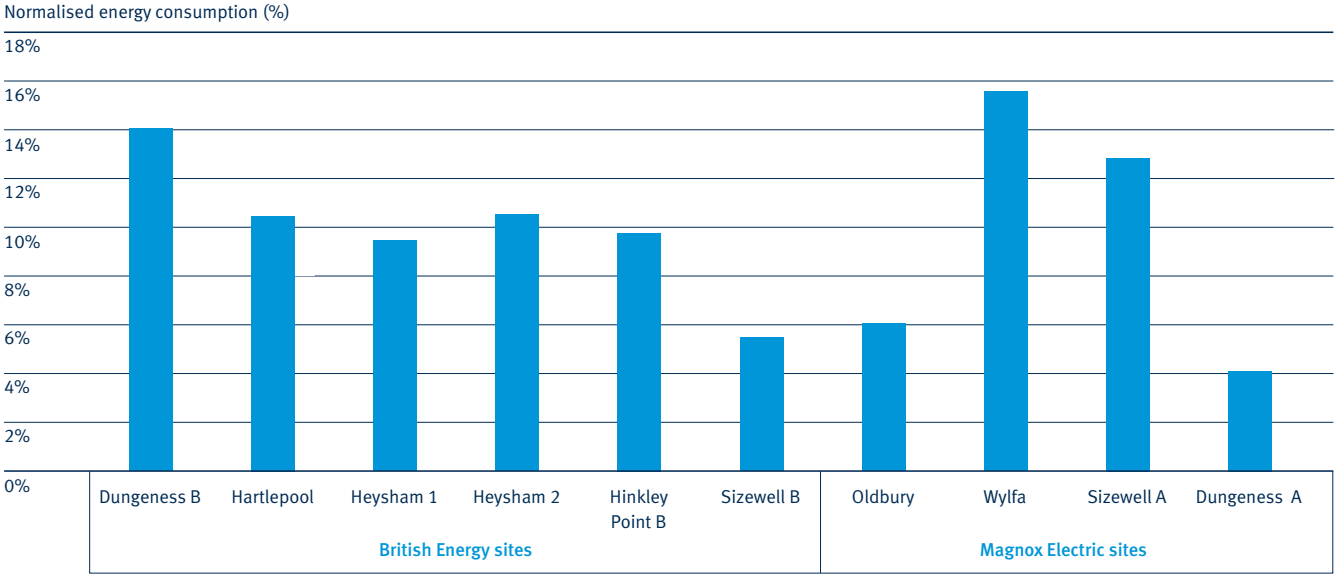


Figure 4: **Sites with highest energy consumption**



- Typically, nuclear power stations consume around 10 per cent of the energy they produce, mostly through the reactor coolant circulators. But, this can vary depending on their design. For example Oldbury uses steam to power the gas circulators, whereas Sizewell A uses electricity. Other factors which may affect the amount of energy used on-site include older plant which may be less efficient, and project or decommissioning work which is taking place. Trends in the normalised energy consumption will help to identify genuine increases or decreases in efficiency at power stations.

Figure 5: **Electricity generation sub-sector – normalised energy consumption[1]**



1 Energy used on site divided by energy sent out to the national grid

Objective 2

Minimise and manage solid waste

2.1 The percentage of ILW at each site that has been conditioned and packaged in a form that can be disposed of

Radioactive waste is categorised as low level (LLW), intermediate level (ILW) or high level (HLW), depending on its activity concentration. ILW is mainly produced as a result of reprocessing and decommissioning work on nuclear sites. Examples of ILW include irradiated fuel cladding, liquid wastes from reprocessing operations and reactor components.

In the UK, there is currently no way of disposing of ILW or long-lived LLW which is unsuitable for near-surface disposal at the Low Level Waste Repository. The NDA's Radioactive Waste Management Directorate (RWMD, formerly Nirex) is developing geological disposal concepts that may provide the basis for an eventual way of disposing of ILW.

ILW is currently either stored in a raw (untreated) form, or is conditioned and/or packaged. Conditioned waste has been treated in some way to convert it into a solid and stable form (for example, by encapsulation in cement). Packaging involves loading conditioned waste into suitable containers (usually made of stainless steel). This makes the waste suitable for long-term storage and/or for disposal. In most cases, conditioning and packaging are carried out as part of the same process.

The NDA RWMD assesses proposals from nuclear site operators for packaging ILW. It provides advice on disposability to the operators to support the operators' safety case for the long term management of that waste. This assessment takes place at various stages during the development and implementation of waste packaging projects. The NDA RWMD issues a 'letter of compliance' (LoC) for waste packages which have met its standards and specifications.

Key messages

- On 1 April 2006, the total volume of intermediate level waste (ILW) 'in stock' (stored wastes from historic and current practices) in England and Wales was 76,378 m^3. This includes raw, conditioned and/or packaged ILW. The total activity of this waste was 4,550,000 TBq. NDA estimates that an additional 133,470 m^3 of ILW with a total activity of 4,713,000 TBq will be produced during decommissioning of existing nuclear sites.
- The fuel reprocessing operations at Sellafield dominate the picture. Sellafield accounted for 70 per cent of the total volume of ILW 'in stock' in England and Wales, and for 92 per cent of the packaged and conditioned volume of ILW.

Figure 6: **Progress with conditioning and packaging ILW at individual sites[2]**

Volume of ILW at Sellafield

- Conditioned & packaged with NDA LoC 14%
- In stock (awaiting conditioning & packaging) 30%
- Yet to arise 56%

Estimated total = 123,900 m³

Activity of ILW at Sellafield

- Conditioned & packaged with NDA LoC 24%
- In stock (awaiting conditioning & packaging) 39%
- Yet to arise 37%

Estimated total = 4,740,000 TBq

Volume of ILW at all other England and Wales sites

- In stock (awaiting conditioning and packaging) 26%
- Yet to arise 74%

Estimated total = 74,020 m³

Volume of ILW at Trawsfynydd

- Conditioned & packaged with NDA LoC 12%
- In stock (awaiting conditioning & packaging) 26%
- Yet to arise 62%

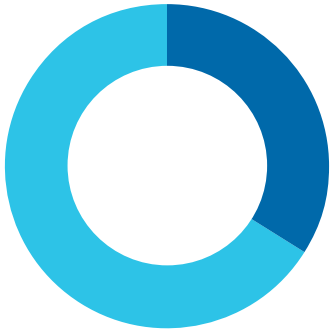
Estimated total = 7,330 m³

Activity of ILW at Trawsfynydd

- Conditioned & packaged with NDA LoC 31%
- In stock (awaiting conditioning & packaging) 49%
- Yet to arise 20%

Estimated total = 3,492 TBq

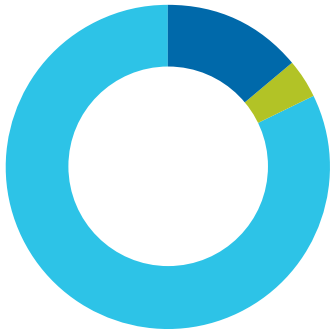
Activity of ILW at all other England and Wales sites



- In stock (awaiting conditioning and packaging) 34%
- Yet to arise 66%

Estimated total = 4,514,000 TBq

Volume of ILW at Windscale



- Conditioned & packaged with NDA LoC 14%
- In stock (awaiting conditioning & packaging) 4%
- Yet to arise 82%

Estimated total = 4,598 m³

Activity of ILW at Windscale

- Conditioned & packaged with NDA LoC 23%
- In stock (awaiting conditioning & packaging) 26%
- Yet to arise 51%

Estimated total = 4,620 TBq

2 Percentages are based on estimated conditioned waste volumes

- Sellafield, Trawsfynydd and Windscale are the only three nuclear sites that have conditioned and packaged any ILW in a form that can be disposed of. These sites have conditioned and packaged a total of 18,259 m^3 of ILW (24 per cent of the total volume 'in stock'), accounting for 25 per cent of the total activity.
- Windscale had made most progress (in percentage terms) in conditioning and packaging its ILW. The site had conditioned and packaged 79 per cent by volume and 48 per cent by activity of the ILW 'in stock'. This is the first site to successfully make significant progress in decommissioning a power reactor (the prototype advanced gas-cooled reactor), and packaging the resulting ILW.
- A total of 19,220 m^3 of ILW was in stock at other nuclear sites in England and Wales. This is yet to be conditioned and packaged for disposal in accordance with NDA's advice. Some of this waste has been put into interim packaging, in a form agreed with us and the Nuclear Installations Inspectorate as being 'passively safe' and suitable for long-term storage but not for final disposal. The NDA has not given this a 'letter of compliance'. There is 6,970 m^3 of interim packaged waste at Sellafield. Other operators (for example GEH) have also chosen to make their ILW safe for storage, but not to condition wastes now. We consider such practices on a case by case basis and will continue to review our position.
- We do not expect the overall picture to change quickly. Packaging and conditioning ILW involves considerable effort in developing plant and processes, and preparing and obtaining approval for safety cases.

P2.2 Inert waste (non-radioactive) – *developmental indicator*

P2.3 Non-hazardous waste (non-radioactive) – *developmental indicator*

P2.4 Hazardous waste (non-radioactive) – *developmental indicator*

Operational or decommissioning activities on nuclear sites may generate significant amounts of non-radioactive waste. Most of this waste comes from construction and demolition projects. Non-radioactive waste is categorised and managed as inert, non-hazardous or hazardous. This may include waste which has been 'cleared' from further control because it contains only very low levels of radioactivity. Operators are expected to use good practice, as agreed in the nuclear industry code of practice on clearance and exemption (published in 2005), to decide whether waste should be classed as radioactive or non-radioactive. Sites are also expected to maximise opportunities to recycle non-radioactive waste.

These are developmental indicators. We are working to improve the definition of the indicators. There are some issues with data quality and comparing data between operators and/or sites which we also need to resolve. Data cannot be compared with the data reported in Spotlight for other industrial sectors because it includes on-site re-use and disposal.

Key messages

- The nuclear sector produced a total of 257,000 tonnes of non-radioactive waste in 2006. Over 75 per cent of the waste was 'inert', with a further 19 per cent classed as 'non-hazardous'. Only a small quantity of hazardous waste was produced.
- The total volume of non-radioactive waste produced was approximately twice as much as in 2005. This is not unexpected as the volume of waste produced can vary considerably year-on-year, depending on what projects are underway. Large increases in non-radioactive waste at three sites more than accounted for the increased total in 2006:
  - at Oldbury, a large quantity of silt was dredged from the site's cooling water lagoon;
  - at Hinkley Point A, all plant was removed from the turbine hall;
  - at Aldermaston, the increase was due to the construction of the laser facility and to the demolition programme.

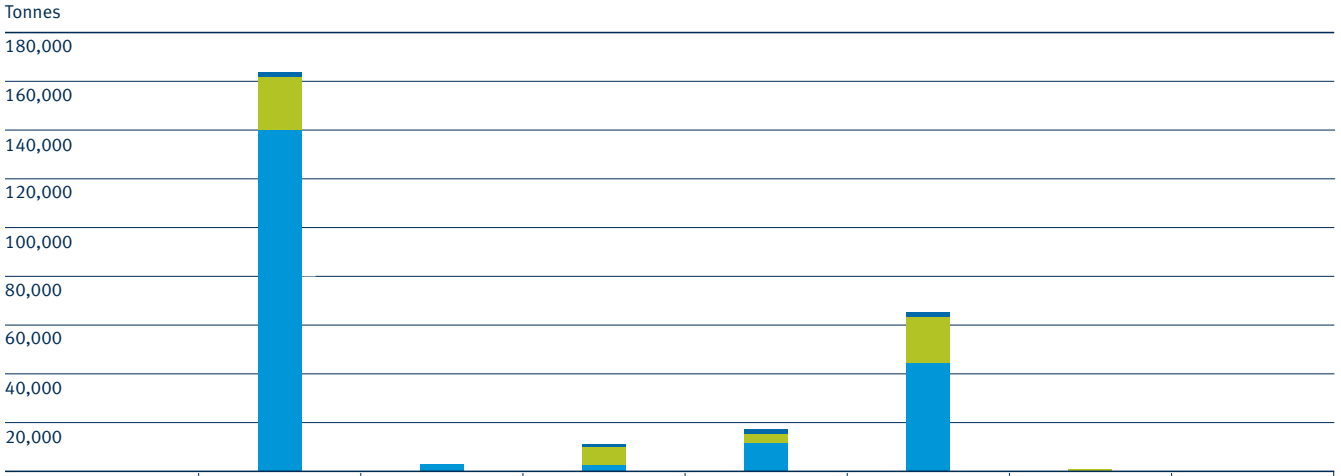
Ten other sites (33 per cent) reported minor increases in waste, while waste decreased on ten sites (33 per cent).

- The electricity generation sub-sector produced 65 per cent of the nuclear sector's non-radioactive waste in 2006. Defence was the only other major producer, accounting for 25 per cent.
- Data on waste reuse or recycling was collected for the first time in 2006. The overall recycling rate for non-radioactive waste in the nuclear sector was 66 per cent.
- Recycling rates varied substantially between companies:
  - Magnox Electric and Urenco recycled all of their inert waste. Sixty per cent of Magnox's inert waste was produced at Oldbury. This is silt dredged from the site's cooling water lagoon, which although disposed of to landfill on-site is considered to be beneficially reused because it provides a temporary lagoon for wild birds. At Hinkley Point A, a large quantity of soil and stone from the excavations associated with the intermediate level waste (ILW) store were reused on-site. AWE appears to have recycled only a very small proportion of its inert waste (0.02 per cent), but this is because the majority is being stockpiled until we approve its release and re-use. MoD did not recycle any of their inert waste. Springfields did not produce any non-radioactive inert waste.

Type of waste	Total quantity, tonnes
Inert	199,506
Non-hazardous	49,597
Hazardous	8,010
Total	**257,113**

Type of waste	% reused or recycled
Inert	74%
Non-hazardous	41%
Hazardous	29%
Total	**66%**

Figure 7: **Waste by sub-sector and type**

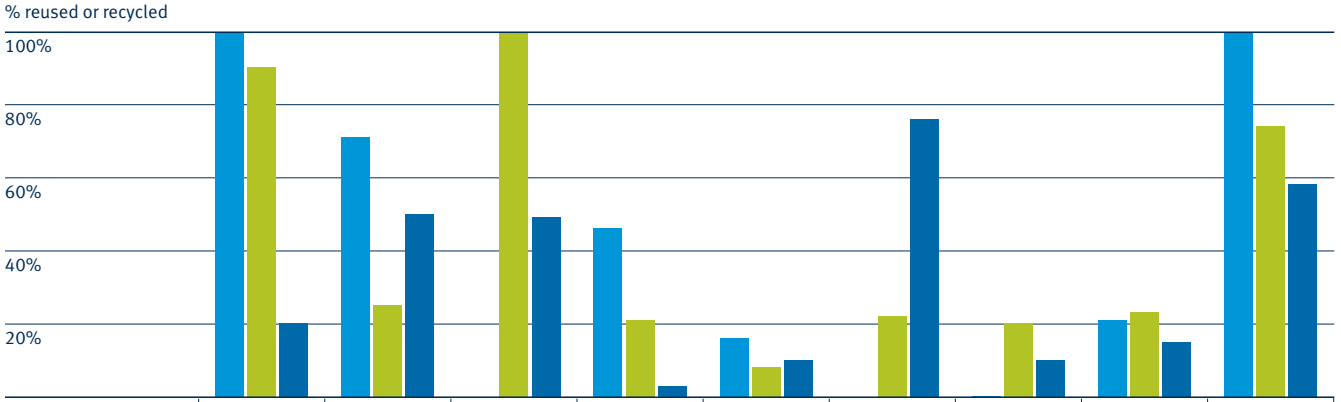


	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
Hazardous	3,140	151	1,360	1,140	2,145	67	7
Non-hazardous	17,946	697	5,040	5,154	19,486	1,046	228
Inert	144,827	1,270	800	8,081	43,927	601	0

- Springfields and Magnox Electric recycled over 90 per cent of their non-hazardous, non-radioactive waste, while UKAEA recycled less than 10 per cent of theirs.
- All MoD sites, together with Urenco and British Energy recycled more than 50 per cent of their hazardous waste. But on the Sellafield site only three per cent of the hazardous waste produced was recycled.

- Recycling rates at different sites varied considerably:
  - Ten sites (33 per cent) recycled all of their inert waste, while nine sites (30 per cent) recycled none. A typical example is where rubble from a demolished building was used as infill material on a decommissioning site.
  - Only three sites (10 per cent) recycled more than 95 per cent of their non-hazardous waste, while two sites (seven per cent) did not recycle any. Typical waste that is recycled on nuclear sites includes metal, paper, wood and plastic.
  - Two sites (seven per cent) recycled 95 per cent or more of their hazardous waste, while five sites (17 per cent) did not recycle any. Low recycling rates may reflect the type of projects taking place on sites. For example, landfill is currently the only viable way of disposing of large asbestos strips which are removed during decommissioning. High recycling rates may reflect major hazard reduction campaigns, with large quantities of oil, lead, chemicals or batteries being sent for recycling.

Figure 8: **Waste reuse/recycling rates by company**



	MEL	BE	SFL	BNGSL	UKAEA	MoD	AWE	GEH	Urenco
Inert	100%	71%	none produced	46%	16%	0%	0.02%	21%	100%
Non-hazardous	90%	25%	100%	21%	8%	22%	20%	23%	74%
Hazardous	20%	50%	49%	3%	10%	76%	10%	15%	58%

Objective 3

Reduce discharges to air and water

To limit the impact of both radioactive and other discharges, the nuclear industry needs to meet all authorisation requirements.

3.1 Proportion of BPM assessments required that have been completed and accepted by the Environment Agency

Conditions in our authorisations for disposing of radioactive waste under the Radioactive Substances Act 1993 require the operator to use best practicable means (BPM) to minimise the amount of waste that needs disposing of, and to minimise the radioactivity discharged to the environment. As legal requirements, assessments are frequently carried out and discussed with us, but there is no specific target to achieve. This indicator is not an effective measure of sector performance and we will remove it when we revise the Nuclear Sector Plan.

3.2-3.5 Annual liquid radioactive discharges

We authorise nuclear sites to discharge liquid radioactive waste into the sea, rivers or into sewers under strict limits. Discharges may include alpha-emitting radionuclides (such as americium and plutonium), beta/gamma emitting radionuclides (including caesium and strontium), and tritium.

The UK is committed to preventing the marine environment of the North East Atlantic being polluted by radiation under the OSPAR convention. This will be achieved by progressively and substantially reducing discharges, emissions and losses of radioactive substances. The ultimate aim is to achieve concentrations in the environment near background values for naturally occurring radioactive substances and close to zero for artificial radioactive substances.

The UK radioactive discharge strategy sets out the UK's plans for achieving this objective. The strategy includes challenging targets for each sub-sector to reduce its liquid radioactive discharges by 2020. If these are met, it is expected that members of the public will receive a radiation dose of less than 0.02 milliSievert (mSv) a year from liquid radioactive discharges to the marine environment made after 2020. The UK discharge strategy is currently being revised. The revision will take into account the impact of planned power station closures and any new nuclear build. Defra is expected to publish consultation documents in December 2008.

The following graphs include the sub-sector targets from the current UK radioactive discharge strategy. However it is important to note that, while the targets are for the UK as a whole, these graphs only include discharge data for English and Welsh nuclear sites. Discharges from nuclear sites in Scotland will contribute towards the targets in the energy production, research and defence sub-sectors.

Key messages

- Reducing liquid radioactive discharges to meet the UK discharge strategy targets by 2020 is one of the key environmental challenges facing the nuclear sector. Good progress is being made towards meeting these targets.
- Total radioactive discharges to water have fallen steadily since 2002. Discharges in 2005 were unusually low because some of the reprocessing plants at Sellafield were temporarily shut down.
- The amount of fuel reprocessed at Sellafield was lower than normal in 2005 and 2006. As a result, discharges from the fuel reprocessing sub-sector were lower in those years than would typically be expected. Nevertheless, fuel reprocessing accounted for 71 per cent of the alpha activity discharged to water in 2006, for over half of the total liquid beta/gamma (excluding tritium) discharges from the nuclear sector, and for 41 per cent of the liquid tritium discharges.
- Fuel fabrication/enrichment was the only other major source of liquid alpha discharges (29 per cent) and liquid beta/gamma discharges (39 per cent). Beta/gamma discharges to water from this sub-sector reduced by 80 per cent compared to 2005. This was a result of ore-processing operations at Springfields closing during 2006.
- Electricity generation accounted for 57 per cent of the liquid tritium discharges in 2006. Discharges of tritium are proportional to electricity generated, and will only decrease as a result of nuclear power stations shutting down.

Figure 9: **Trends in radioactive discharges to water**

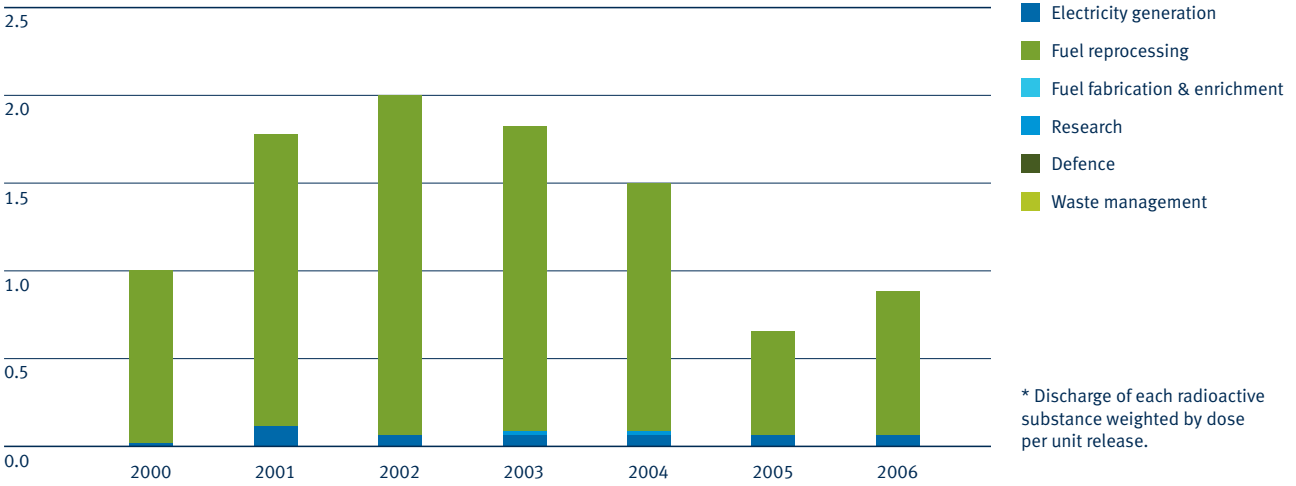
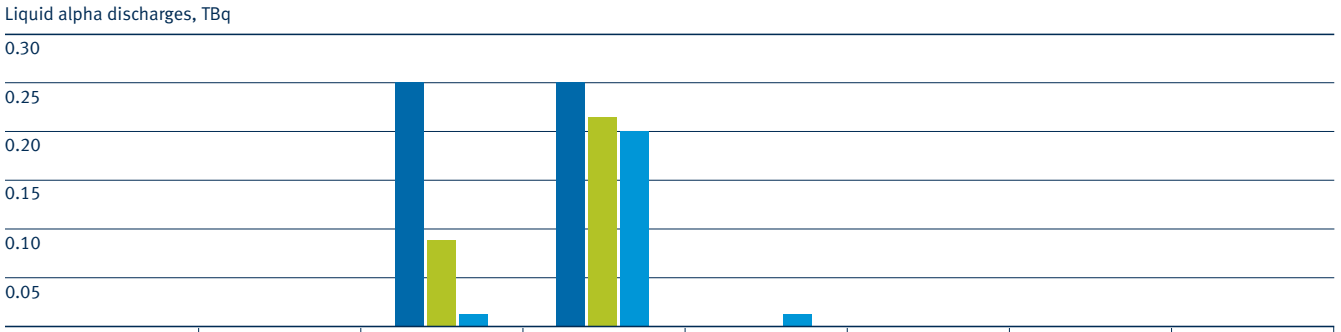


Figure 10: **Annual liquid alpha discharges**

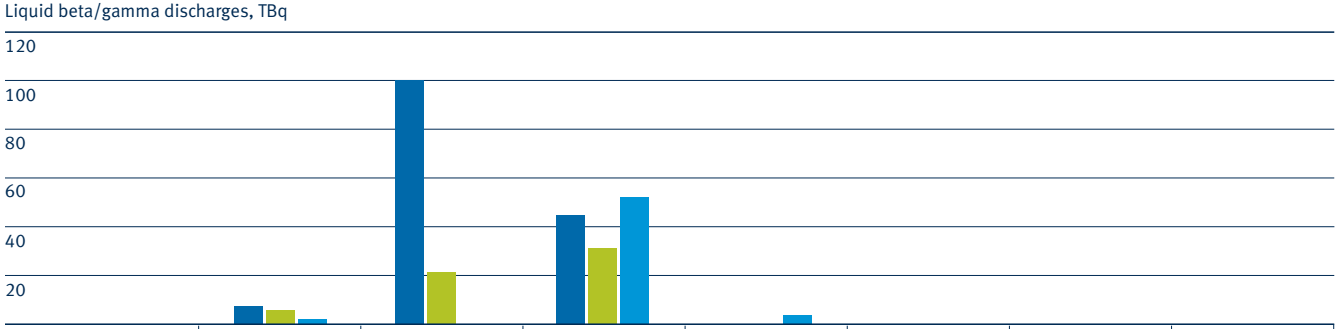


	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
2005 discharges	4.21E-04	2.50E-01	2.50E-01	2.95E-04	8.81E-05	1.00E-05	7.40E-04
2006 discharges	5.15E-04	8.41E-02	2.10E-01	1.15E-04	5.81E-05	1.24E-05	4.48E-05
2020 tagets	n/a	n/a	1.00E-02	2.00E-01	8.00E-03	n/a	n/a

Note: there are no targets in the UK radioactive discharge strategy for liquid alpha discharges from the electricity generation, defence, medical & bioscience or waste management sub-sectors.

- Although minor, liquid alpha discharges from the electricity generation and medical/bioscience sub-sectors increased by more than 20 per cent compared with 2005. Liquid alpha discharges from all other sub-sectors showed a continuing downward trend, and those from the research sub-sector were comfortably within the 2020 target.
- Discharges of tritium from the electricity generation and research sub-sectors increased between 2005 and 2006, due to increased electricity production from power stations and work to decommission the Winfrith site. Tritium discharges from other sub-sectors are decreasing.
- The research sub-sector maintained its performance within the 2020 targets for liquid alpha, beta/gamma and tritium discharges in 2006, although showing a slight increase in discharges compared to 2005.
- Liquid beta/gamma discharges from the defence sub-sector remained static, while tritium discharges decreased compared to 2005.
- Discharges of technetium-99 from fuel reprocessing continued to decrease in 2006. Sellafield has met a challenging target of reducing these discharges from 190 TBq in 1995 to less than 10 TBq in 2006. This was achieved by the introduction of a new abatement technique and other process changes made by the operator as a result of requirements we imposed under its authorisation.

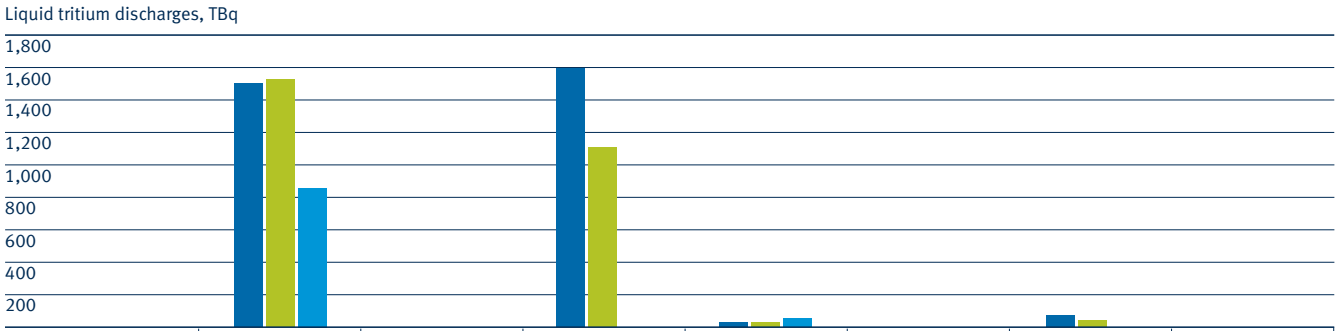
Figure 11: **Annual liquid beta/gamma discharges (excluding tritium)**



	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
2005 discharges	4.52E+00	1.00E+02	4.30E+01	1.22E-02	1.04E-03	2.83E-01	5.98E-05
2006 discharges	4.04E+00	2.10E+01	2.90E+01	2.80E-02	1.04E-03	2.92E-01	7.10E-04
2020 targets	1.50E+00	Virtually zero	5.00E+01	9.00E-01	3.00E-03	n/a	n/a

Note: there are no targets in the UK radioactive discharge strategy for liquid beta/gamma discharges from the medical & bioscience or waste management sub-sectors.

Figure 12: **Annual liquid tritium discharges**



	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
2005 discharges	1.53E+03	brt	1.60E+03	8.51E+00	2.00E-01	4.04E+01	brt
2006 discharges	1.54E+03	brt	1.10E+03	1.60E+01	1.05E-01	2.48E+01	brt
2020 targets	8.50E+02	n/a	n/a	2.00E+01	4.00E-01	n/a	n/a

brt = below reporting threshold

Note: There are no targets in the UK radioactive discharge strategy for liquid tritium discharges from the fuel fabrication & enrichment, fuel reprocessing, medical & bioscience or waste management sub-sectors.

Figure 13: **Annual technetium-99 discharges from reprocessing**

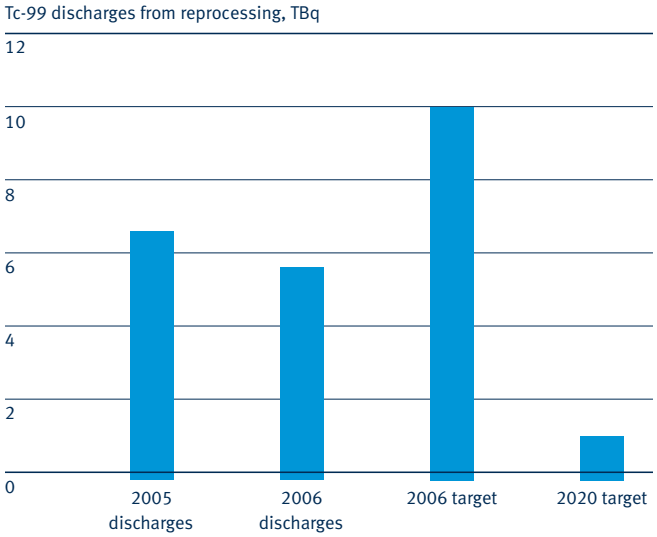
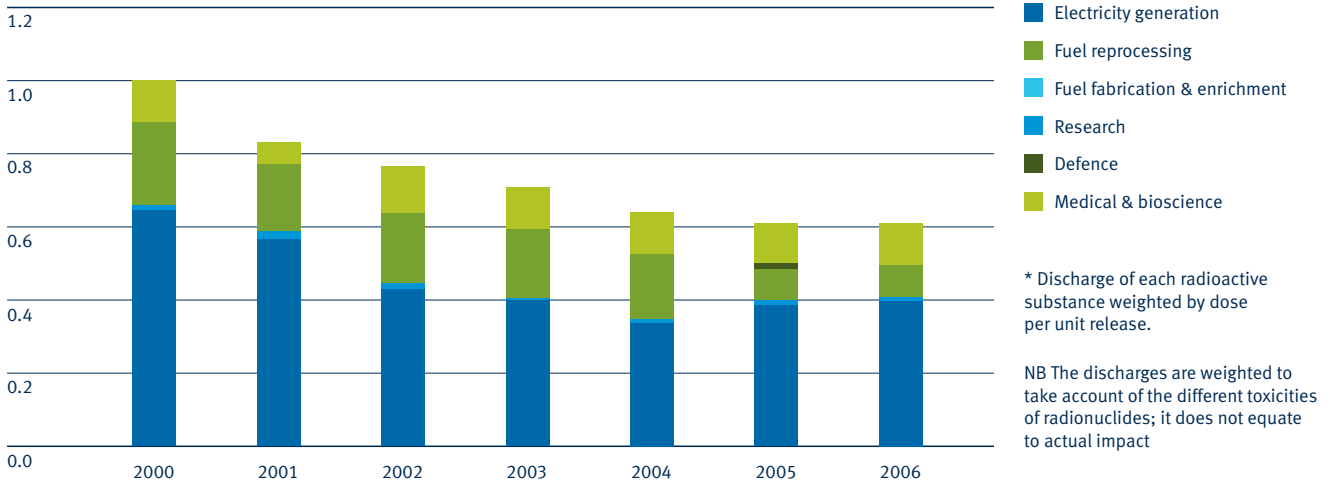


Figure 14: **Trends in radioactive discharges to air**



* Discharge of each radioactive substance weighted by dose per unit release.

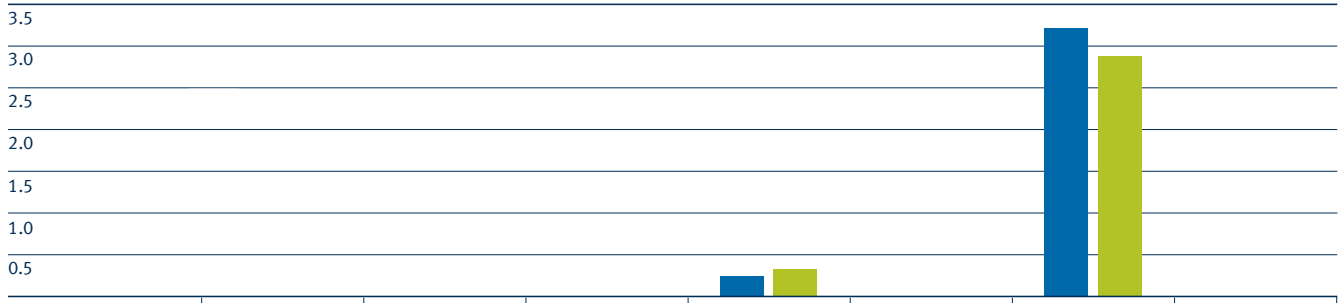
NB The discharges are weighted to take account of the different toxicities of radionuclides; it does not equate to actual impact

3.6 Annual radioactive discharges to air

Key messages

- Radioactive discharges to air from the nuclear sector as a whole continued to fall in 2006. This trend may not continue if the amount of fuel reprocessed at Sellafield returns to typical levels in the future.
- Radioactive discharges to air from the electricity generation sub-sector increased slightly in 2006 compared to 2005. This was due to increased electricity production at some Magnox power stations. We expect emissions from this sub-sector (and therefore total discharges) to decrease again in 2007, as two of the older Magnox power stations shut down at the end of 2006. Gaseous

Figure 15: **Gaseous alpha discharges**



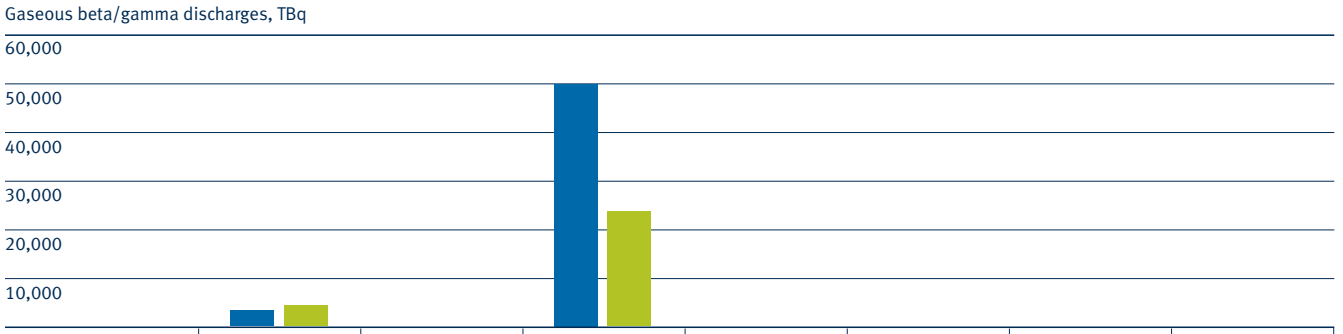
	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
2005 discharges	brt	6.70E-04	8.70E-05	2.70E-01	brt	3.20E+00	8.95E-08
2006 discharges	brt	4.30E-04	1.12E-04	2.90E-01	5.85E-08	2.92E+00	brt

brt = below reporting threshold

discharges from the research sub-sector also increased slightly in 2006. This was due to decommissioning projects being carried out.

- The medical and bioscience sub-sector accounted for over 90 per cent of the nuclear sector's gaseous discharges of alpha-emitting radionuclides in 2006. The research sub-sector was the only other significant contributor. The largest discharges were of radon-222 from stored radium waste at The Grove Centre and Harwell.
- Gaseous discharges of beta/gamma-emitting radionuclides (excluding tritium) from fuel reprocessing at Sellafield halved in 2006, compared to 2005, but still accounted for over 85 per cent of the nuclear sector's total. The amount of fuel reprocessed in 2005 and 2006 was lower than normal, and discharges from the sub-sector were therefore lower than would typically be expected. Electricity generation was the only other significant contributor to beta/gamma discharges.
- The Maynard Centre accounted for 60 per cent of the nuclear sector's gaseous tritium discharges. Fuel reprocessing activities at Sellafield were the only other major contributor to gaseous tritium discharges. Approximately twice as much Magnox fuel was reprocessed in 2006 compared to 2005, contributing to a doubling of tritium discharges to air from the site.

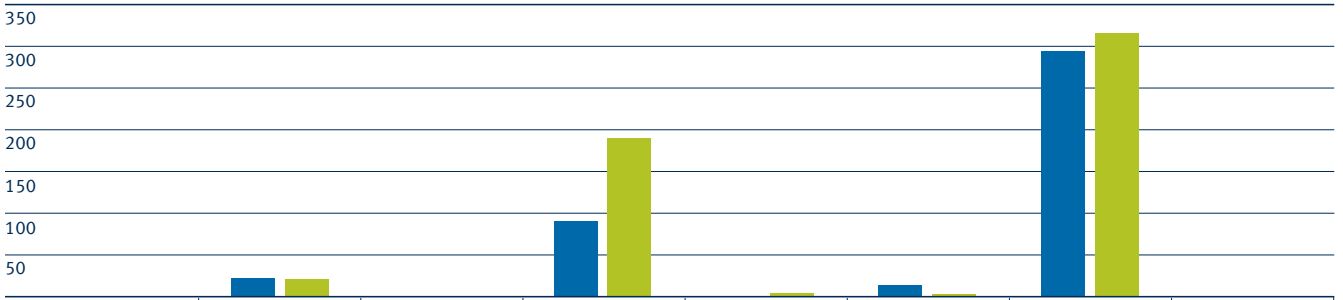
Figure 16: **Gaseous beta/gamma discharges (excluding tritium)**



	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
2005 discharges	3.13E+03	brt	5.00E+04	1.79E-03	9.01E-03	1.92E+01	1.64E-07
2006 discharges	3.53E+03	2.42E-06	2.30E+04	1.21E-01	3.06E-02	1.89E+01	brt

brt = below reporting threshold

Figure 17: **Gaseous tritium discharges**



	Electricity generation	Fuel fabrication & enrichment	Fuel reprocessing	Research	Defence	Medical & bioscience	Waste management
2005 discharges	20.5	brt	93.0	0.7	14.0	292.4	brt
2006 discharges	20.2	brt	190.0	2.6	1.2	319.0	brt

brt = below reporting threshold

3.7 Critical group doses due to radioactive discharges

Food and the environment near nuclear sites are regularly monitored to find out what levels of radioactivity they contain. The monitoring results are used with information on the habits of people who live near the sites to assess radiation doses to the public as a result of waste discharges. Changes in doses occur from year to year and are mostly caused by variations in radioactivity concentrations and dose rates. However, in some years doses are affected by changes in people's habits, in particular food consumption. The assessed doses for those groups that are the most exposed to radiation near all nuclear sites in the UK are known as critical group doses.

More detail on levels of radioactivity in food and the environment is published annually in the **RIFE report**.

Figure 18: **Highest critical group doses due to liquid discharges**

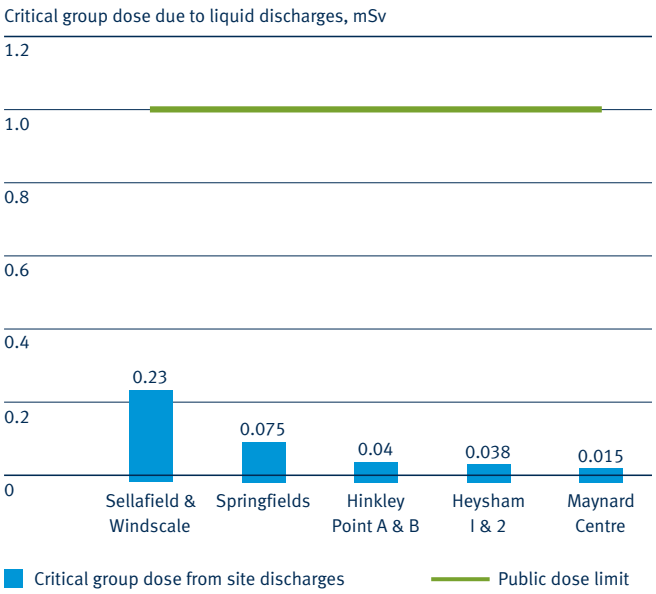
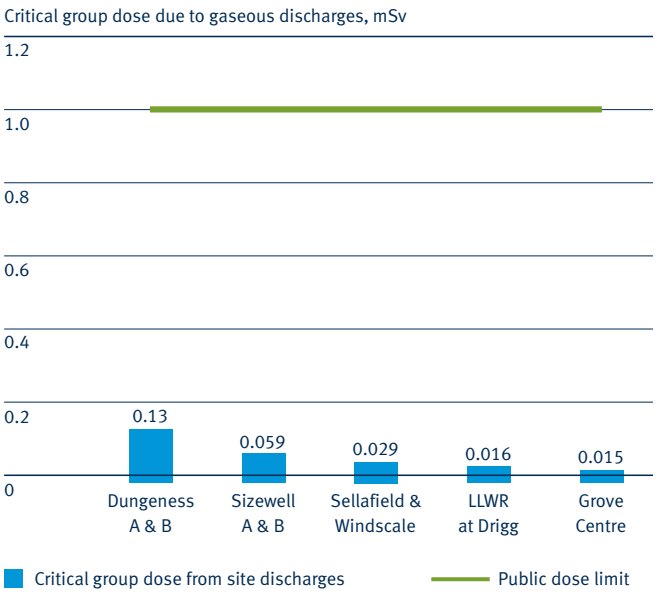


Figure 19: **Highest critical group doses due to gaseous discharges**



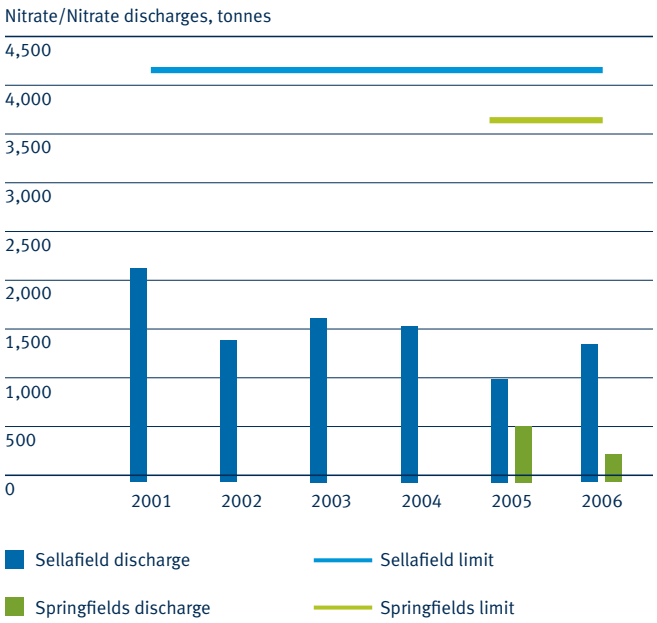
Key messages

- Doses to critical groups as a result of liquid and gaseous discharges from nuclear sites are generally very small, and were all well within the 1 mSv limit for members of the public in 2006.
- A group of people in Cumbria that consumed a large quantity of fish and shellfish received the highest dose of radiation due to liquid discharges. Discharges from the Sellafield and Windscale complex were estimated to have contributed 0.23 mSv to this dose in 2006. Most of the dose was due to the accumulation of caesium-137, plutonium isotopes and americium-241 in seafood and the environment from past liquid discharges. Other groups as far afield as South Wales also received radiation doses as a result of discharges from Sellafield, but at lower levels than the Sellafield critical group doses.
- Critical group doses as a result of liquid discharges from eight nuclear sites were all less than 0.5 per cent of the dose limit for members of the public.
- In 2006, the highest critical group dose from gaseous discharges was 13 per cent of the dose limit. People living near the nuclear power stations at Dungeness received this dose, mostly by inhaling argon-41 which is discharged from the Dungeness A station as part of its routine operations.
- Critical group doses as a result of gaseous discharges from 11 nuclear sites were less than 0.5 per cent of the public dose limit of 1 mSv/y.

3.8 Discharges of nitrates and nitrites to controlled waters

Nitrate and nitrite are some of the most substantial non-radioactive discharges from the nuclear sector. They are mainly produced when nitric acid is used to dissolve nuclear fuel. Discharges of nitrates and nitrites from Sellafield and Springfields are a small percentage of the total quantity of these nutrients discharged to the Irish Sea. However, they have a measurable impact on nutrient levels near the discharge points.

Figure 20: **Nitrate and nitrite (as nitrogen) discharges**



Key messages

- The nuclear sector discharged 1,570 tonnes of nitrate and nitrite to water in 2006.
- Discharges of nitrate and nitrite from Sellafield increased by 35 per cent compared to 2005, mainly because more Magnox fuel was reprocessed.
- Discharges of nitrate and nitrite from Springfields reduced by 50 per cent compared to 2005 as a result of closing ore-processing operations at the site.

P3.9 Integrated waste strategies (IWS) – *developmental indicator*

P3.9a Proportion of sites with an integrated waste strategy (IWS) documented in accordance with the IWS Specification and Guidance

P3.9b Proportion of sites with an IWS action plan, with timescales, developed in consultation with regulators

An integrated waste strategy (IWS) is a document that describes all wastes (radioactive and non-radioactive) that are expected to be produced from current and future activities on a site. It also describes what the operator is doing to improve arrangements for waste management, including how it will take a more integrated approach. The aim of these documents is to drive improvements at individual sites, and to support the development of regional and national integrated waste strategies, for example by the Nuclear Decommissioning Authority (NDA) for those wastes arising from its sites. A more integrated approach should improve the transparency in waste management across the industry, encourage sharing of best practice and the adoption of novel or innovative solutions made practical by the economies of scale.

In early 2007, the UK Government and the devolved administrations published a new low-level radioactive waste (LLW) policy statement. This included an expectation that nuclear operators would base LLW management decisions around an integrated waste strategy.

Key messages

- Since 2005 NDA has required its site operators to document integrated waste strategies, and to use these to underpin lifetime plans for decommissioning and clean up. We are encouraging other (non-NDA) nuclear operators to produce integrated waste strategies.
- Operators reported that 22 nuclear sites (73 per cent) had an integrated waste strategy in place by the end of 2006. We are in the process of reviewing integrated waste strategies with operators to ensure that they are fit for purpose.
- Over three-quarters of the sites that had an integrated waste strategy (IWS) in place had also developed an IWS action plan, and had discussed this with the regulator and with interested organisations, by the end of 2006.
- Integrated waste strategies and accompanying action plans were being developed at SL Capenhurst, Urenco Capenhurst, Aldermaston and Burghfield, but not at three MoD sites or the LLWR.

P3.10 Environmental concentrations of key radionuclides in various media – *developmental indicator*

Concentrations of radionuclides in the environment respond slowly to decreases (or increases) in radioactive discharges. This is not an effective measure of current environmental performance in the nuclear sector. We will remove this indicator when we review the Nuclear Sector Plan in 2008.

Objective 4

Reduce greenhouse gas emissions

4.1 Greenhouse gases emissions

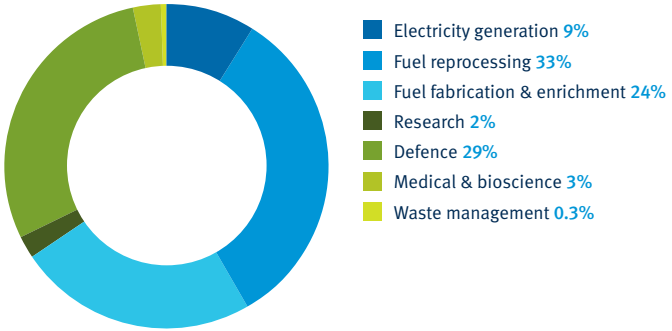
Climate change is one of our top priorities. It is estimated that the nuclear sector saves between five and 12.6 per cent of the UK's total carbon emissions by reducing the need for gas, coal or oil generation. This is a significant contribution towards minimising climate change. In 2006, the sector generated 18 per cent of the UK's electricity and released greenhouse gases equivalent to 0.6 million tonnes of carbon dioxide. If this amount of electricity had been generated using fossil fuels, something like an extra 40[3] million tonnes of carbon dioxide emissions would have been generated.

However, the nuclear sector, like all businesses, has an impact on the environment. Greenhouse gas emissions may originate directly from the processes, from the use of energy, or from transport associated with the activities of the nuclear sector.

Key messages

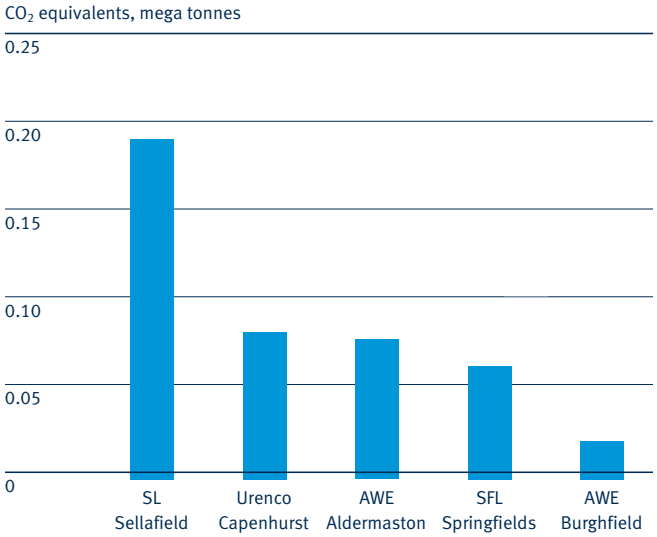
- In 2006, the nuclear sector generated 18 per cent of the UK's electricity and released the equivalent of 0.6 million tonnes of carbon dioxide.
- Fuel reprocessing, defence activities and fuel fabrication/enrichment accounted for the majority of the sector's greenhouse gas emissions. Electricity generation was a relatively minor contributor (nine per cent). The emissions by sub-sector differ from energy use because this indicator includes greenhouse gases other than carbon dioxide.

Figure 21: **Greenhouse gas emissions by sub-sector**



3 The value depends on the energy mix. If all the electricity was produced by coal approximately 58 million tonnes of carbon dioxide would be generated. For gas the equivalent figure is 26 million tonnes.

Figure 22: **Five biggest producers of greenhouse gases**



- It is not possible to compare emissions with 2005 data for the sector as a whole because accurate data is not available for some sites for that year.
- Most nuclear sector operators are developing and/or implementing site-specific strategies to minimise significant emissions of greenhouse gases. For example, energy management strategies are being introduced at Aldermaston, Burghfield and Sellafield. AWE has published its approach to the design, construction and operation of existing, refurbished and new buildings and infrastructure. Magnox Electric promotes car-sharing, AWE is implementing a site-wide travel plan, and GE Healthcare now obtains all its electricity from renewable sources.

Comparison with other sectors

- Industrial sectors we regulate report greenhouse gas emissions associated with their activities to our pollution inventory. Out of all the sectors that report to us, the energy sector is the major producer of greenhouse gases. In 2006, it produced 182 million tonnes of carbon dioxide (a three per cent reduction on 2005 emissions). The nuclear sector accounts for less than 0.3 per cent of the total emissions from the energy sector.

Objective 5

Develop site restoration and biodiversity action plans

5.1 Sites 'determined' to be affected by chemical contamination, as defined by the Environment Act 1995

Contaminated land is a potentially significant environmental and waste management issue for the nuclear sector. The scale of this issue differs widely between individual nuclear sites. In many cases, contamination is a legacy from the way sites were previously used.

For land on nuclear sites, the Contaminated Land Regulations, issued under Part 2A of the Environment Act 1990, only consider chemical contamination. Local authorities are responsible for determining whether sites are contaminated. A nuclear site which is determined as contaminated would be designated as a 'special site' under the Regulations, in which case we would be responsible for making sure it is remediated.

A site will be 'determined' as contaminated if the land appears to be in such a condition (by reason of substances in, on or under it) that significant harm is being caused or there is significant possibility of harm being caused, or controlled waters are polluted or likely to be polluted. For this to happen, there needs to be one or more 'significant pollutant linkages'. This means that there must be a source of contamination, a receptor (something affected by contamination, for example, a man) and a pathway linking them.

Key messages

- By 2006, a total of 764 sites had been 'determined' as contaminated land in England and Wales.
- Aldermaston is the only nuclear site which has 'determined' contaminated land under Part 2A of the Contaminated Land Regulations. AWE is currently undertaking voluntary remediation on part of the site because it is contaminated by chemical solvents.
- Many other site operators have developed or are developing site restoration strategies to tackle soil contaminated with radioactive and non-radioactive substances which are unlikely to significantly harm people or the environment (see indicator 5.2).

5.2 Proportion of sites with management plans for contaminated land developed in consultation with regulators

Many nuclear site operators are also taking action to identify and manage land which is affected by chemical or radioactive contamination at levels below the threshold defined as 'contaminated' under the Part 2A contaminated land regulations. The NDA, in its first strategy, published in 2006, identified a need for more information on soil contamination on NDA sites. Since that time, the NDA and its site operators have done work to understand more about this contamination and to develop plans to manage and restore the sites.

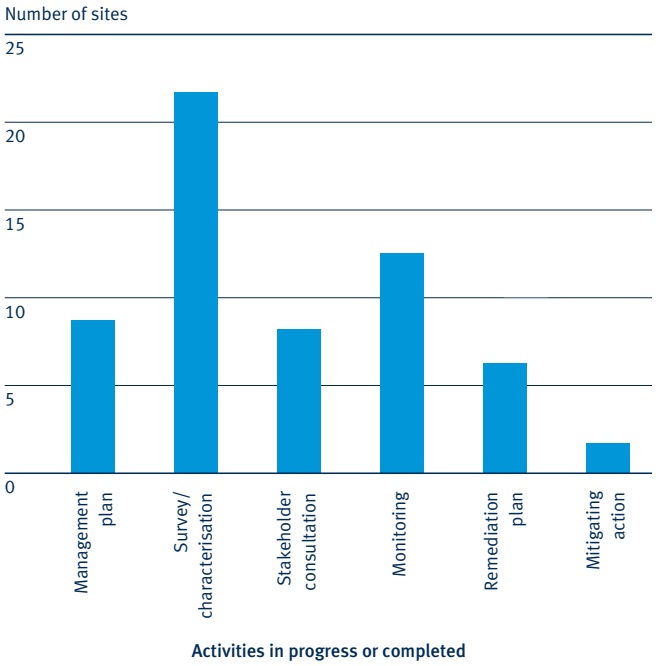
This 'contaminated land' does not present a significant risk to employees or the public, but managing it is recognised as good stewardship. Sites which are to be fully decommissioned and delicensed will need to be cleaned up at some point so that they are suitable for future redevelopment.

The Nuclear Installations Inspectorate (NII) is responsible for regulating radioactive contaminated land on nuclear licensed sites. The NII addresses this as part of its site licence conditions.

Key messages

- Including Aldermaston, operators considered that 23 nuclear sites (77 per cent) had some areas with radioactive and/or non-radioactive contamination in the soil. Operators had arrangements in place to investigate the extent of the contamination and/or plans to manage/treat the contaminated areas at all of these sites in 2006.
- Six nuclear sites (20 per cent) were not considered to be contaminated by their operators, and therefore do not require a management plan. Desktop or intrusive surveys had been completed on three of these sites. Survey work was ongoing at one other potentially contaminated site.
- Operators were asked to identify what stage of development the management arrangements for contaminated land were on each site for the first time in 2006. Survey or characterisation work was underway or completed at the majority of sites (see below), while other arrangements were generally less well developed. Sites may be making progress on more than one stage at the same time, and are likely to continue to review management plans and refine them as more information becomes available.

Figure 23: **Arragements in place for managing contaminated land**



5.3 Implementing biodiversity action plans at appropriate sites

Most nuclear licensed sites are in remote, rural locations, and many cover large areas of land. Several sites have unique habitats, and some are home to rare plants or animals. Land on or near some nuclear sites is designated as a site of special scientific interest (SSSI) or as a wetland of international importance under the Ramsar Convention. Most operators recognise that it is important to manage their sites for wildlife, and are actively promoting biodiversity. Developing biodiversity action plans (BAPs) is a voluntary way for operators to identify, protect and enhance the conservation value of their sites.

Key messages

- By the end of 2006, 21 nuclear sites (70 per cent) had developed biodiversity action plans (BAPs). The first BAPs were published in 2004, and several are now well-developed, with recommendations being implemented and reviewed regularly. Four nuclear sites – Bradwell, Aldermaston, Burghfield and one MoD site – published their first BAPs in 2006.
- Oldbury, Trawsfynydd and Urenco Capenhurst were developing BAPs during 2006, and one MoD site was considering developing a BAP.
- Operators considered that BAPs were not required on the remaining six nuclear sites because the land is of little ecological interest.
- Examples of actions being taken to manage or improve biodiversity on nuclear sites include:
  - managing land at Berkeley to benefit plants and animals, including a tree planting scheme which will reduce the visual impact of the intermediate level waste store;
  - an ecological survey at Sellafield to establish the local population of natterjack toads in ponds adjacent to the nuclear licensed site, so that they can be managed properly;
  - developing and implementing a heathland management plan for the sites of special scientific interest (SSSIs) on the Winfrith site;
  - managing habitat for black redstarts and developing a tree register for the Aldermaston and Burghfield sites;
  - sustainable management of the GE Healthcare sites, including encouraging native plants and providing bird boxes, hedgehog boxes and log piles to encourage wildlife.

Objective 6

Improve transparency, understanding and involvement between the Environment Agency, industry and stakeholders

The nuclear industry needs to understand the interests and demands of individuals and organisations that are interested in or affected by its operations. This means more than just reacting to requests from interested groups. It should also involve making sure all interested groups know and understand what operators are doing and that they can communicate and discuss their concerns.

6.1 Percentage of sites holding local liaison/site stakeholder group meetings

As a regulator we consult publicly on applications for new authorisations or significant variations to existing authorisations. We take account of the views we receive during consultation in coming to a decision on the application. For this reason we encourage nuclear site operators to work closely with their local stakeholders to ensure they understand what is happening on the sites, how it may affect them and to give them an opportunity to influence decisions on the site. We believe that failure to do this properly in the past is one of the reasons that the nuclear industry did not secure public support for its proposals for radioactive waste disposal during the eighties.

The nuclear industry now recognises the importance of stakeholder support to enable progress to be made, particularly in the decommissioning and clean-up of sites. As a result we believe that the industry is becoming more transparent in its activities and is working more closely with its stakeholders. The approach undertaken recently by the Committee on Radioactive Waste Management (CoRWM) as part of the 'Managing Radioactive Waste Safely' programme exemplified this – with the committee focusing on ensuring its work was open, transparent and inclusive of the views of all parties.

Key messages

- All nuclear sites hold some form of regular local liaison meeting, termed either a local liaison committee (LLC) or, at NDA sites, a site stakeholder group (SSG). Site operators are expected to do this as part of their nuclear site licence. These groups generally each involve members of local authorities, trade unions as well as interested members of the public and other local organisations.
- In addition to supporting SSGs at each of their sites, the NDA has now established a national stakeholder group. This provides a regular forum for discussion on NDA's overall strategy for nuclear decommissioning and clean-up. For the first time it brings together representatives of each of the groups from around NDA sites, as well as representatives from other interested organisations, including the regulators, local authorities and non-governmental organisations.
- During 2006, NDA sites consulted interested organisations about how their sites should be used after they were decommissioned, as well as consulting the public on its draft Business Plan 2008/11.

6.2 Percentage of operators who publish environmental reports

Key messages

- All nuclear sites submit discharge monitoring returns to us. Some also submit environmental monitoring returns. In most cases this information is sent to public registers in the Environment Agency region and to relevant local authorities.
- 83 per cent of operators in the nuclear sector published their own environmental report in 2006:
  - Seven operators – Magnox Electric, BNGSL, UKAEA, Urenco, AWE and two MoD sites published separate environmental reports.
  - British Energy and GE Healthcare published environmental information as part of their corporate social responsibility reports.
  - Springfields Fuels Ltd published a combined environment, health and safety (EH&S) report.
  - Two MoD sites did not publish environmental reports.
- Sites also report on their environmental performance to site stakeholder groups.

P6.3 Monitoring progress with operators' plans for involving interested organisations – *developmental indicator*

We still have to determine a valid performance indicator to monitor progress with operator' plans for involving interested organisations. We need to consider this further.

Objective 7

Promote product stewardship and wider supply chain benefits

'Product stewardship' is about managing the health, safety and environmental impacts of a product throughout its life cycle in a responsible and ethical way. Each company throughout the supply chain plays a part in determining the overall impact a product has. Controlling the environmental impacts of an operation needs to extend beyond the boundary of the operating site. Manufacturers can play a crucial role in promoting product stewardship by establishing sound environmental policies for how they behave as both purchasers and suppliers.

P7.1 Number of companies with published policies describing their aims and methods as a purchaser to promote product stewardship practices among their suppliers – *developmental indicator*

P7.2 Number of companies with published policies describing their aims and methods as a supplier to promote product stewardship practices among their customers – *developmental indicator*

The product stewardship indicators are at an early stage of development. We are promoting the concept of product stewardship within our own organisation and with industry. We will address this as we review all the sector plans. It is difficult to define an indicator that is meaningful for the whole nuclear sector because of the many different products.

Some examples of existing initiatives related to product stewardship, mainly as purchasers, within the nuclear sector are:

- All operators in the nuclear sector have environmental management systems in place. The majority are registered under the ISO 14001 standard. Many sites have carried out sustainability assessments or analysis of their environmental impacts as purchasers.
- Sellafield was awarded the Chartered Institute of Purchasing and Supply (CIPS) certification standard in 2005. Examples of excellence and innovation in the site's approach to purchasing and supply management were highlighted in a number of areas, including code of conduct, strategic planning, strategic sourcing, tender management, environmental impact and ethics.
- Supply chain management is a key consideration for GE Healthcare. The company operates an approved suppliers list and supplier pre-qualification process. Supplier reputational guidelines make sure that suppliers meet minimum requirements for environment, health and safety practices.
- Magnox Electric's supply chain management policy includes environmental issues, for example, sourcing decisions must take account of costs and benefits over the lifetime of the product, including considering quality, maintenance and disposal. For generic supply contracts, supplier and contractor performance is regularly monitored for improvement.
- AWE requires prospective suppliers to complete a business evaluation questionnaire which includes questions on environmental performance. As a supplier, AWE is required to comply with the MoD's sustainability standards.
- RRMPOL is developing a REACH (Registration, Evaluation and Authorisation of Chemicals) notice to suppliers and has introduced a list of banned and restricted substances to minimise the use of carcinogenic, mutagenic and reprotoxic chemicals (CMR) and very persistent, very toxic (vPvT) chemicals.
- NDA has a key influencing role in promoting supply chain stewardship on many nuclear sites and expects its contractors to manage their operations to the highest standards of safety and environmental performance.

The nuclear sector is keen to find out what other sectors are doing on product stewardship, and to learn from them.

Objective 8

Work to risk-based regulatory and environmental management systems

We need to make sure that the areas of regulation that apply to the nuclear sector are proportionate, outcome-focused and effectively implemented, and support them with appropriate guidance. The industry is expected to meet regulatory requirements and use appropriate management systems to control all environmental aspects of its operations.

8.1 Number and proportion of modern, multi-media RSA disposal authorisations issued containing management conditions

We issue site-specific authorisations under the Radioactive Substances Act 1993 which allow radioactive waste to be disposed of. These specify discharge limits and conditions that aim to protect people and the environment. Modern authorisations are integrated or multi-media, which means they cover all permitted disposal routes from a nuclear site in a single permit (rather than having one permit for discharges to air, another for discharges to water, etc).

Key messages

- By the end of 2006, 21 nuclear sites (70 per cent) had multi-media authorisations. A multi-media authorisation was issued for the Winfrith site in 2006.
- Multi-media authorisations for the six British Energy sites became effective on 1 April 2007, for HMNB Devonport on 1 June 2007 and for Sellafield Ltd Capenhurst on 1 September 2007.
- Urenco (Capenhurst) is the only site which does not have a multi-media authorisation, although this is expected to become effective in 2008.

8.2 Pollution incidents: Annual number of category one and two incidents

An incident is defined as ‘a specific event which is being brought to our attention, is within our areas of responsibility and which may have an environmental and/or operational impact.’

We record pollution incidents reported to us in the National Incident Recording Scheme (NIRS), and classify them under a Common Incident Classification Scheme (CICS). The classification is based on the **actual** impact an incident has on the environment, whether on air, land and/or water quality. For example, for incidents involving radioactive substances (though the sector plan indicator is not restricted to these), the categories are:

- **category one** – major environmental impact, for example, a major nuclear site emergency leading to a significant amount of radioactivity being released off site. The national response plan may need to be put in place for this and members of the public may be exposed to large doses of radiation;
- **category two** – significant environmental impact, for example, a loss of control resulting in radioactive material being dispersed into the environment. This could cause localised off-site contamination and need action to be taken to tackle this;
- **category three** – minor environmental impact, for example, a release of radioactivity resulting in localised contamination where little or no action is needed;
- **category four** – no environmental impact, for example, an event has taken place but there has been no impact on or damage to the environment.

Key messages

- There were no category one or category two pollution incidents in the nuclear sector in 2006. For comparison, we recorded a total of 94 category one and 825 category two pollution incidents across all sectors.
- We hope to report lower category incidents in future years, using available comparative data for other sectors. This is in order to help track trends to give early warning in changes in environmental performance. In 2006 the total number of category three and category four incidents for nuclear sector were 10 and three respectively, compared to totals for industry we regulate in England and Wales of 12,685 category three incidents and 3,986 category four incidents.

8.3 Breaches of permits: Annual number of category one and two breaches of permits

We aim to protect the environment by setting permit conditions that prevent or control the risk of polluting the environment and/or causing harm to human health. If an operator does not comply with the site permit conditions, their activities may pose a threat to the environment and action may need to be taken.

Breaches of permit (non-compliances) are classified under the Compliance Classification Scheme (CCS) according to how severe they are or potentially could be. The CCS classification for a non-compliance event uses the same type of scale as CICS, that is a category one breach has or could have a significant impact on the environment, while a category four breach has no potential to have an effect. Examples of different category breaches involving radioactive substances regulation are:

- **category one** – a major nuclear site emergency in the UK leading to a significant amount of radioactivity being released off-site with urgent action needed to protect members of the public (for example, evacuation);
- **category two** – radioactivity released off site with limited action needed to protect members of the public (for example, iodate tablet distribution or temporary sheltering);
- **category three** – radioactivity released off site but no action needed to protect members of the public;
- **category four** – a loss of management control or limited failure to report data, where there is no potential for radioactive waste to be generated or radioactivity to be released.

Similar categories have been developed for breaches involving our other regulatory regimes.

Key messages

- There were no category one or category two breaches of permits in the nuclear sector in 2006. For comparison, we recorded a total of 158 category one and 1802 category two breaches across all sectors.
- We hope to report lower category breaches in future years, using available comparative data for other sectors. This is in order to help track trends to give early warning in changes in environmental performance. In 2006 the total number of category three and category four breaches of permit in the nuclear sector were 16 and 12 respectively, compared to totals for industry we regulate in England and Wales of 19,692 category three breaches and 10,204 category four breaches.

8.4 Number of companies with enforcement actions and prosecutions

Key messages

- We took enforcement action against three companies in the nuclear sector under the Radioactive Substances Act 1993 in 2006:
  - We issued an enforcement notice to GE Healthcare on 27 January 2006 after tritium was discovered in groundwater at The Grove Centre, Amersham in November 2005. Under the notice, GE Healthcare had to improve its arrangements for complying with Schedule1(21) of their authorisation, provide us with a 'best practicable environmental option' (BPEO) for managing the contamination and provide a report identifying the extent and source of the contamination (so far as is reasonably practical). These requirements have all been completed.
  - British Energy received an enforcement notice in April 2006 because of deficiencies in discharge monitoring arrangements at Sizewell B, after they failed to monitor discharges of carbon-14 to air from one of the main stacks for four days. There was no evidence that discharges had increased, but there had been other problems with sampling equipment and procedures at the site. Under the enforcement notice British Energy had to review and improve the relevant equipment, procedures and working arrangements to minimise the potential for further failures in the monitoring and sampling of the site's radioactive discharges. The review was completed in June 2006, and significant improvements have been introduced (for example, peer checks, where relevant).
  - Sellafield Ltd received an enforcement notice on 17 July 2006 in relation to a leak of water from the open pond used to store spent fuel from advanced gas-cooled reactors (AGR) at Sellafield in February 2006. The leak occurred because the pond water had been raised to an extremely high level in order to test level instrumentation. The environmental consequences of the leak were small, but we had concerns about the manner in which the test had been undertaken. Sellafield Ltd proposed a number of actions to be implemented at the AGR open pond storage facility. Because of the potential for similar problems to exist in other storage ponds, our enforcement notice required Sellafield Ltd to implement the recommendations across all fuel storage ponds on the Sellafield site. In summer 2007, we reviewed the improvements made to the AGR open pond storage facility with the Nuclear Installations Inspectorate. These were generally found to be satisfactory, and a programme of inspections of other pond storage facilities is planned for 2008.
- We did not take any prosecutions against nuclear sector operators in 2006.

8.5 Number (and proportion) of PPC applications and variations determined and issued within target time

8.6 Number (and proportion) of Agency decisions for RSA applications and variations completed within programme time

We grant permits to operators under the Pollution Prevention and Control Regulations (PPC) and the Radioactive Substances Act (RSA).

Key messages

- No PPC applications were determined for nuclear sites in 2006, although several were being determined during the year (but were not due to be completed until 2007).
- All 15 RSA authorisations we issued in 2006 were completed within programme time agreed with operators. The time taken to determine RSA authorisations depends on the type of authorisation (application, minor or major variation). Times ranged from one week for a minor variation for Windscale to 28 months for Winfrith's new multi-media authorisation. The average time for determining authorisations issued in 2006 was seven months.

P8.7 Indicator based on scores from radioactive substance regulation risk assessment methodology – *developmental indicator*

RSR OPRA is still in development, so no reporting was possible against this indicator in 2006.

Areas for improvement

Overall, the environmental performance of the sector was very good during 2006, with improvements over previous performance being made in a number of areas. Here, we highlight some areas for improvement that we have identified against the eight main environmental objectives.

Objective 1: Reduce the consumption of natural resources

- Less water and energy was used at the sites that reported back to us in 2006. But we feel that there is still room for improvement at some sites, particularly those that have the opportunity to update their infrastructure and management systems.

Objective 2: Minimise and manage solid waste

- Progress on conditioning and packaging intermediate level waste (ILW) for disposal varied from site to site, with good progress being made at Sellafield, Trawsfynydd and Windscale. More progress needs to be made on other sites, although some have packaged ILW for long-term storage. Progress in this area will be slow, as the work is long-term, but we expect to see continued progress.
- Most non-radioactive waste generated on nuclear sites is from construction and demolition. Recycling rates varied substantially between sites. Operators need to improve their data on recycling. There are probably opportunities to share best practice within the nuclear sector, and to learn from other sectors, to help those sites that are not achieving high recycling rates to improve their performance.

Objective 3: Reduce discharges to air and water

- We expect to see the industry continue to make good progress in reducing discharges of radioactive waste, by applying 'best practicable means'. In the longer-term, we expect industry to meet all of the targets in the UK radioactive discharge strategy.
- Considerable progress has been made in documenting integrated waste strategies at NDA and other nuclear sites. In many cases these have identified significant opportunities for improving waste management. We are in the process of reviewing the strategies with operators to ensure that they are fit for purpose. We would like to see progress towards the development and delivery of a national integrated waste strategy.

Objective 4: Reduce greenhouse gas emissions

- Most sites are developing strategies to reduce their greenhouse gas emissions, but there is scope to learn from good practice within the sector and from other sectors.

Objective 5: Develop site restoration and biodiversity action plans

- Considerable work has been done to improve understanding of the nature and extent of contaminated land on NDA (and other) sites and on developing management plans to address these. This needs to continue. We may need to develop measures to report progress on the delivery of these management plans.
- Most nuclear sites have developed biodiversity action plans (BAPs) and are starting to implement them. We need to develop measures to report progress with the implementation of BAPs.

Objective 6: Improve transparency, understanding and involvement between the Environment Agency, industry and other interested organisations

- Most sites are working well with external organisations, and we expect this to continue. In particular, operators need to make sure that engagement takes place in time to inform decision-making itself, rather than simply as a means of informing stakeholders of the outcome of any decision-making.

Objective 7: Promote product stewardship and wider supply chain benefits

- All operators need to adopt the practice of assessing and influencing the environmental performance of their suppliers.
- More work needs to be done in the future to develop this objective for the nuclear sector to use, and to be able to compare performance between sectors.

Objective 8: Work to risk-based regulatory and environmental management systems

- Operators must take action to ensure there are no serious pollution incidents or breaches of permits, and therefore no need for enforcement.
- Operators and us to use lower categories of incidents and breaches to track trends that may indicate changes in environmental performance.
- We will develop RSR OPRA, and use this to develop performance measures for environmental management systems.

Progress with tasks & milestones

As well as performance indicators, the Nuclear Sector Plan also includes a number of tasks and milestones for operators, us and others to address. Progress with those tasks and milestones which were due to be completed during 2006 is noted below. Sellafield Ltd Capenhurst, LLW Repository Ltd and three MoD sites did not report on their progress.

1.1 Operators to identify significant areas of resource consumption and make sure these are addressed in environmental management systems by September 2006

Achieved. British Energy, Magnox Electric, AWE, GE Healthcare, Springfields Fuels Ltd, RRMPOL and Sellafield Ltd (Sellafield site) all reported progress against this task. Significant areas of resource use include energy, water, fuels, chemicals and building construction materials. These are generally addressed in company management systems, many of which are certified to ISO14001:2004 standard.

Examples of good practice include:

- An energy audit at the Maynard Centre, which was completed towards the end of 2006. It identified projects that could potentially reduce carbon dioxide emissions by 96 tonnes a year. An energy audit is planned at the Grove Centre.
- Using building management systems to manage energy consumption on some Magnox sites.
- British Energy working with Envirowise to identify reasonable targets for water use at each of their sites. A GE Healthcare project is also looking at opportunities for saving water.
- Annual objectives are set in the Harwell-Winfrith environmental management system to achieve continuous improvement. The liquid effluent treatment plant (LETP) trade waste system at Harwell was modified in 2006 to reduce the need to dilute effluent and therefore reduce the amount of water used.

2.1 All operators to assess their ability to use the British Radioactive Waste Information Management System (BRIMS) for recording information on radioactive waste and packages by March 2006

Good progress has been made with this task. The software behind BRIMS is being updated. Sellafield Ltd, Magnox Electric and UKAEA are currently using BRIMS. British Energy has trialled BRIMS at one site and intends to roll it out to all stations once the updated system is available. AWE expect to use BRIMS for its 2007 inventory return. GE Healthcare and RRMPOL have considered BRIMS, but have decided not to use it. Springfields Fuels Ltd still uses a paper-based system for recording information on radioactive waste and waste packages.

2.4 Operators to identify approximate quantities of hazardous, non-hazardous and inert waste produced annually, and what happens to this waste by September 2006

Achieved. All operators reported quantities of hazardous, non-hazardous and inert waste in their 2006 returns. Data on recycling rates was requested for the first time in 2006, and most operators have attempted to provide this information.

2.5 Environment Agency to work with operators to assess, and, if appropriate, define potential performance indicators for hazardous, non-hazardous and inert waste by the end of 2006

Some progress has been made with this task. Indicators in this area can be misleading, because there are differences between sites in operational and decommissioning phases. Further work is required.

3.1 Tc-99 in liquid discharges from Sellafield to reduce to 10 TBq/y by end 2006

Achieved. Discharges of technetium-99 from Sellafield have reduced from 195 TBq/yr in 1995 to under 10 TBq/yr in 2006 as a result of substantial investment in new treatment plant.

3.2 Continued reduction in total alpha liquid discharges from Springfields as specified in new authorisation, due to ending Magnox fuel fabrication by end 2006

Achieved. Uranium ore processing at Springfields ended early in 2006. New authorisation limits came into force in January 2008.

3.4 GE Healthcare to commission waste recovery and recycling plant at Cardiff by end 2006

Achieved. GE Healthcare has spent £28 million on developing various technologies for treating waste arising from the tritium and carbon-14 manufacturing processes at the Maynard Centre. The tritium recycling plant was installed in 2006, and is due to come on-line in 2008. GE Healthcare also invested significantly in developing a recycling process for its carbon-14 discharges, but after exhaustive investigation the company has concluded that the technology is only effective on a pilot scale. GE Healthcare presented and discussed these findings with us. We obtained an independent peer review of GE Healthcare's work and agree with the conclusion. Overall improvements in the site's manufacturing processes have already resulted in carbon-14 reductions of more than 50 per cent compared with 1997 levels.

3.6 Environment Agency (with FSA, SEPA, HSE-NII and DoE NI) to implement requirements of Basic Safety Standards (BSS) Direction 2000 and report retrospectively on total doses in Radioactivity in Food and the Environment (RIFE) Report annually in November

Achieved. We have continued to implement the requirements of BSS Direction 2000 as joint integrated habit survey data for exposure to radiation around nuclear sites becomes available.

In 2006 total retrospective dose to the public was assessed at 20 sites: Aldermaston, Burghfield, the two Devonport sites, The Maynard Centre, The Grove Centre, near the nuclear power stations at Dungeness, Hartlepool, Hinkley Point, Heysham, Sizewell, Trawsfynydd and Wylfa, near the fuel cycle plants in West Cumbria (Sellafield), at Springfields and around Winfrith.

3.7 Environment Agency to review environmental monitoring arrangements at specific sites with industry and FSA in line with authorisation reviews

Achieved. Environmental monitoring programmes conducted by us, the Food Standards Agency and operators are reviewed, together with authorisation reviews, where needed. In 2006, reports of reviews were published for Bradwell and Hinkley Point A nuclear power stations.

3.10 Operators to make sure that all significant emissions to air and water were addressed in environmental management systems by September 2006

Achieved. All significant emissions to air and water from British Energy, Magnox Electric, UKAEA, AWE and GE Healthcare sites, Springfields Fuels Ltd, RRMPOL and Sellafield Ltd are addressed in the companies' environmental management systems.

3.11 Environment Agency to work with operators to assess, and if appropriate, define potential performance indicator: 'Proportion of activities or waste streams for which integrated waste strategies have been constructed and maintained' by September 2006

Following problems with reporting against indicator 3.9 in 2005, the definition of this indicator was changed for 2006 reporting.

3.12 Environment Agency to work with operators to assess, and if appropriate, define potential performance indicators: 'Environmental concentrations of key nuclides in various media, for example OSPAR monitoring locations' by September 2006

We agreed with operators that there was little value in retaining this indicator.

4.1 Operators to develop and implement site specific strategies for minimising significant greenhouse gas emissions (taking into account process, energy used and transport activities) by end 2006

Most operators have achieved this task. Progress reported is as follows:

- British Energy takes part in the European Union Emissions Trading Scheme (EU ETS) for carbon permits. The main sources of greenhouse gas emissions from these sites are running diesel generators and gas turbines as back-up power supplies to meet nuclear safety requirements, and process use of carbon dioxide in their reactors. Transport is trivial compared to either of these other factors.
- AWE published an energy strategy in 2005 (covering the period 2005 to 2015). This set out the company's intentions for sustainable energy management and the approach to be adopted for the design, construction and operation of existing, refurbished and new buildings and infrastructure. The main aim of the strategy is to minimise direct and indirect carbon dioxide emissions from AWE's sites. They are also implementing a site-wide travel plan. This aims to reduce the number of cars used through various initiatives, including car sharing, park and ride, encouraging people to cycle on-site, and bus schemes that operate on and between sites.
- GE Healthcare has introduced a programme to reduce greenhouse gas emissions. The UK sites have entered into a scheme to obtain 100 per cent renewable energy through Gaz De France to help achieve their corporate responsibility objectives.
- Springfields Fuels Ltd also takes part in the carbon-trading scheme and has a policy to minimise emissions of hydrofluorocarbons. Use of transport may need looking at further, although initial calculations suggest that its contribution to greenhouse gas emissions from the site will be less than five per cent.
- RRMPOL has developed management plans for activities which make a significant contribution to emissions, with the aim of making continued improvements.
- Sellafield Ltd has set a number of objectives to improve its environmental performance, as required under ISO14001. These include not wasting energy, and reducing the amount of traffic to and from the site. An energy management strategy for the Sellafield site was finalised in 2007. This promotes the advantages of energy management both from an environmental and a financial point of view and identifies the way forward for the company.
- Magnox Electric does not have a specific strategy for reducing greenhouse gases over and above measures they have already taken. These include implementing control measures at the three sites with emergency standby generators (to comply with EU emissions trading), optimising operation of plant, promoting car sharing, and environmental awareness campaigns. They have taken a pragmatic view that their emissions are not significant compared to other sectors, and are largely from 'fugitive emissions' (for example, equipment leakages) which are difficult to control. This issue will be reviewed.

5.1 Operators to have policies in place covering contaminated land management by September 2006

See report under indicator 5.2.

5.2 Operators to have management arrangements in place for contaminated land, stating who is responsible for implementing policy and arrangements by the end of 2006

See report under indicator 5.2.

5.3 Operators to determine which sites will benefit from biodiversity action plans (BAPs) by June 2006

Completed. See report under indicator 5.3.

5.4 Operators to develop biodiversity action plans for appropriate sites by the end of 2006

See report under indicator 5.3. British Energy sites are trying to gain the 'biodiversity benchmark' during 2007/08.

6.1 Operators to identify main interested organisations and work with them to identify and prioritise issues of concern by September 2006

Achieved. Most operators have managed this task by working with their local liaison committees or site stakeholder groups. Other examples of work include:

Sellafield Ltd consulting groups and individuals who have shown an interest in activities at the Sellafield site on key strategic options and 'best practicable environmental options' (BPEO) for the site. Sellafield Ltd also uses its website to advertise wider opportunities to get involved such as workshops, public meetings and focus groups.

Magnox Electric has a long-standing process in place for identifying the main interested organisations from the local community and MPs through to non-governmental organisations, NDA and regulators locally and nationally. Several Magnox sites also run BPEO conferences to involve interested organisations in decision-making.

AWE intends to develop a corporate communications strategy for the local authority.

As well as consulting about how the Harwell site should be used, UKAEA carried out specific consultations on high volume low activity waste from the Harwell site and on the site waste BPEO study.

6.3 Environment Agency to work with operators to assess, and if appropriate, define potential performance indicators 'Monitoring progress with interested organisations' plans' by September 2006

We agreed with operators that this would not be retained as a separate indicator, but we will consider how to include it within indicator 6.1.

8.1 Environment Agency to invite views from interested organisations on the Nuclear Sector Plan by June 2006

Achieved. We invited views from interested organisations when the plan was published. We will seek further views when we review the Nuclear Sector Plan in 2008.

8.3 Environment Agency (with SEPA) to publish and consult on report on approaches to setting limits, when statutory guidance to the Environment Agency on regulating radioactive discharges is finalised

Some progress has been made with this task. Defra aims to revise and consult on the draft statutory guidance before finalising it. It is likely that the guidance will be at a high level and will refer to more detailed guidance, which will be provided in the form of radioactive substances regulation environmental principles (REPs), which are currently being developed.

8.5 Environment Agency to develop risk assessment methodology for radioactive substances regulation (RSR) by June 2006

Not achieved. The development of the RSR Operator Performance and Risk Appraisal (OPRA) scheme has been delayed. We have developed an outline plan, setting out what will need to be done to implement a formal, risk-based approach to compliance assessment. Progress has been delayed because the generic OPRA structure is not mature and stable enough to use as a sound base for further development work; this is being further developed. We expect the scheme to be developed and available for use by the end of 2008.

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