Environment Agency

nuclear sector plan

2012 environmental performance report

Foreword

I am pleased to introduce this annual report on the environmental performance of the nuclear industry in England and Wales. It describes the performance of the industry measured against the objectives and indicators set out in Version 2 of the Nuclear Sector Plan for the year 2012.

The Nuclear Sector Plan sets out environmental challenges facing the nuclear industry over the next few years, and how we can work together to address them. It encourages operators to consider environmental issues and to improve their environmental performance beyond the minimum standards of regulation. It also commits the Environment Agency to continue our work to be a 'better regulator', by improving and streamlining environmental regulation.

Version 3 of the Nuclear Sector Plan was issued at the end of 2012; hence this will be the last performance report in the Version 2 format. In Version 3 we have revised and updated the plan to reflect continuing progress against objectives, and new developments in the nuclear industry, particularly in the area of decommissioning. We are pleased that the industry continues to support the use, and further development, of the Nuclear Sector Plan. We want the industry to use it as a basis for regular dialogue, sharing of lessons learned, and innovative thinking, to further improve its environmental performance.

The industry continued to perform and progress well against the Nuclear Sector Plan objectives in 2012, while at the same time maintaining good relationships and sharing best practice. In recent years the overall trend in water and energy use has been downwards; radioactive discharges have reduced and the industry is reusing or recycling a high proportion of its inert and non-hazardous wastes. The industry has diversified its waste management activities for low level radioactive waste (LLW) to the extent that in 2012 it avoided sending 87% of LLW to the national facility in Cumbria, which will help extend its life. Disappointingly, the amount of Intermediate Level Waste (ILW) stored on site that has been retrieved, conditioned and repackaged, has remained below 30% since 2005. However, projects are progressing at Sellafield and other sites (for example, Bradwell and Berkeley) that should see this figure increase in the next few years.

The industry has continued to take action in response to the accident at the Fukushima nuclear power plant in Japan, which was caused by a large earthquake and tsunami. Operators of all licensed nuclear sites in the UK have carried out safety investigations at their sites for extreme natural events and are now looking at appropriate improvements.

Recognising the joint effort between ourselves and the nuclear industry, where 'we' is used in the body of this document it applies to the Environment Agency and the industry collectively.

Although this is a report for 2012, it should be noted that in April 2013 Natural Resources Wales (NRW) was created and that it is now responsible for environmental regulation of nuclear sites in Wales.

Logos of the organisations participating in the nuclear sector plan are shown below.

Ed Mitchell – Director of Environment & Business, Environment Agency

Summary

This report describes the environmental performance of the nuclear industry in England and Wales. It measures performance against the objectives and performance indicators set out in Issue 2 of the Nuclear Sector Plan, published in July 2009. The data is provided by the operators of the sites or is taken from national inventories. The operators as a group judge their performance against the objectives. Overall, the environmental performance of the industry during 2012 was good, with improvements made in a number of areas. In this summary we highlight how the industry performed against its eight main environmental objectives during the year, and since 2005 when we started reporting. The 'traffic light' indicates the status of each objective as follows:


Poor performance in 2012


Areas where performance was adequate in 2012


Good performance in 2012


Positive trend in performance since 2005


Negative trend in performance since 2005

Minimise the amount of natural resources used		
In 2012 energy generation increased but fuel reprocessing decreased. However, there was no substantial change in energy use and only a slight increase in water use. In 2012 the industry used just under seven million megawatt hours of electricity (1% less than in 2011) and just over 14 million cubic metres of water (7% more than 2011). Energy use and also water use have fluctuated since 2005 and seen a net decline.		
Recognise the impact of climate change		
In 2012 the nuclear industry in England and Wales generated over 49 TWh of electricity, which, if produced by fossil fuels, would have released around 35 million tonnes of CO_2. Greenhouse gas emissions (measured as CO_2 equivalent) from the nuclear industry as a whole remained at the same levels as 2011. This was despite an increase in the amount of electricity generation in 2012. However, some sites did substantially reduce their CO_2 emissions in 2012 such as Dungeness A.		
Minimise discharges to air and water		
Discharges to air and water remain low, with several sub-sectors of the nuclear industry already achieving their 2020 targets in the UK Discharge Strategy. Most emissions decreased in 2012 with only alpha discharges increasing (by around 20%) mainly as a result of discharges from the fuel reprocessing sub-sector. The reductions are mostly due to a decrease in fuel reprocessing in 2012 compared to 2011. Overall, discharges generally remain low in comparison to 2005 levels.		
Minimise and manage solid waste		
During 2012 the industry avoided sending 87% of its Low Level Waste (LLW) to the national repository compared to 84% in 2011. Operators continue to recycle a very high percentage of their inert and non-hazardous wastes. Progress in the retrieval, conditioning and packaging of 'legacy waste' and other Intermediate Level Waste (ILW) has slightly increased, but it has remained below 30% of such wastes stored on site since 2005. However, ILW retrievals from storage vaults at Magnox sites, such as Bradwell and Berkeley, and susbsequent conditioning and packaging, should see this figure rise in future years.		
Demonstrate sound environmental management and leadership		
Nuclear operators continue to maintain robust environmental management arrangements at their sites.		

Manage land quality and biodiversity		
The number of sites with land quality management plans remained constant. Biodiversity plans have been implemented at most nuclear sites, with a number of operators achieving biodiversity benchmarks.		
Improve or maintain a very high level of regulatory compliance		
The nuclear industry continues to maintain a high standard of regulatory compliance, with far fewer incidents than other regulated sectors. The total number of incidents and breaches increased in 2012, but the majority of these issues had no, or minor, environmental impact. There were no incidents or breaches with major or significant environmental impact. The increase in the number of breaches recorded since 2010 is partially the result of a change in Environment Agency internal guidance on the recording of permit breaches.		
Achieve better regulation		
The Environment Agency continues to progress against each of its improvement goals. In 2012 the Environment Agency provided Site Environment Reviews for all nuclear sites to provide transparency in how it regulates the sites. The Environment Agency carried out a series of themed audits at nuclear sites on operator arrangements for 'out of scope' wastes and liquid effluent as well as publishing its new MCERTs standard on radioanalysis. The Environment Agency published new guidance on the criteria for setting limits on the discharge of radioactive waste from nuclear sites. Verbal and/or written feedback to operators within two months of notification of an event has increased.		

Contents

Introduction 2
Minimise the amount of natural resources used 4
Recognise the impact of climate change 6
Minimise discharges to air and water 8
Minimise and manage solid waste 17
Demonstrate sound environmental management and leadership 23
Manage land quality and biodiversity 23
Improve or maintain a very high level of regulatory compliance 24
Achieve better regulation 27
Conclusions 29
Glossary 30
Links to participating organisations 31

Introduction

This report presents the latest information on environmental performance for the nuclear industry in England and Wales. It describes the progress made by the Environment Agency and the nuclear industry towards meeting the eight objectives set out in issue 2 of the Nuclear Sector Plan, published in 2009.

1. Minimise the amount of natural resources used.
2. Recognise the impact of climate change.
3. Minimise discharges to air and water.
4. Minimise and manage solid waste.
5. Demonstrate sound environmental management and leadership.
6. Manage land quality and biodiversity.
7. Improve or maintain a very high level of regulatory compliance.
8. Achieve better regulation.

The data is either provided by the operators of the sites or taken from national inventories. Operators, as a group, judge their performance against the objectives.

Environmental performance of the nuclear industry

The nuclear industry is diverse. It includes a wide range of activities including electricity generation, decommissioning and clean-up of redundant facilities, waste management, research and development and defence.

With the Environment Agency's support and encouragement, the industry has committed to, and successfully delivered, improvements in its overall environmental performance, while continuing to make significant achievements and contributions to the UK economy.

Highlights in the industry's environmental performance in 2012 include:

- Electricity generated by nuclear power in England and Wales saved approximately 35 million tonnes of CO_2 (equivalent - based on the amount of CO_2 that would have been produced had the same amount of energy been generated using fossil fuels). This is a significant contribution towards helping the UK meet its climate change targets.

- Overall, emissions to air and water remain low and on track to meet targets. Decreases in liquid discharges in 2012 were mainly the result of reduced discharges from Sellafield, due to a smaller amount of reprocessing.

- In 2012 there was less LLW consigned to the national repository. Operators also sucessfully increased the percentage of LLW that went to routes other than the national repository, thus minimising the unnecessary use of this national asset.

- In total, the sites recycled 99% of inert wastes and 90% of non-hazardous wastes.

- The nuclear industry continues to deliver a high standard of regulatory compliance with far fewer incidents than in other regulated sectors.

Significant challenges ahead

While the overall environmental performance of the nuclear industry against the Nuclear Sector Plan remains good, work still needs to be done in the key area of progressing the retrieval, conditioning and packaging of Intermediate Level Waste (ILW). Sites are starting to tackle some of the more difficult-to-treat ILW, which presents a significant engineering challenge. Research into methods and technologies to treat various types of ILW is ongoing.

At present, the UK Government is in the process of developing a Geological Disposal Facility (GDF) as the preferred method of dealing with the disposal of higher activity radioactive wastes from England and Wales. In January 2013 the process for site selection in West Cumbria ended as a result of Cumbria County Council voting not to proceed to the next stage of the process. In September 2013 the UK Government launched a public consultation on the site selection process for a geological disposal facility.

This report is the last one against Issue 2 of the Nuclear Sector Plan. Issue 3 of the plan sets out the main environmental issues facing the nuclear industry over the next few years. This new version was issued in December 2012 and it introduces a new objective.

- Objective 5: Progress decommissioning and manage land quality

A further five objectives for the industry are carried over from Issue 2 of the Plan, plus an objective for the Environment Agency.

- Objective 1: Minimise resource consumption and carbon footprint.
- Objective 2: Minimise discharges to air and water.
- Objective 3: Promote use of the waste hierarchy.
- Objective 4: Demonstrate environmental management and leadership
- Objective 6: Maintain a very high level of regulatory compliance.
- Objective 7: Further implement better regulation.

More information

In the following chapters we describe the environmental performance of the nuclear industry as a whole against the eight Nuclear Sector Plan objectives. Information on the performance of individual companies can be found by following the links to their websites provided at the end of this report.

Feedback

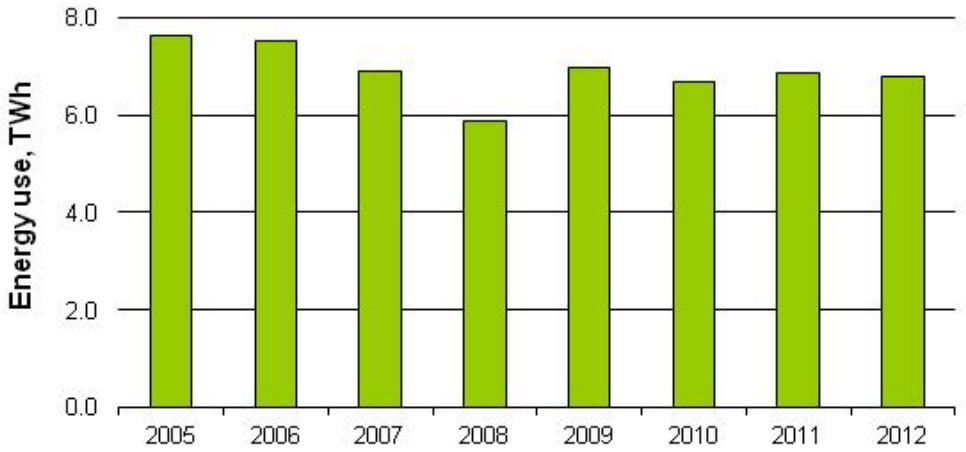
We welcome your views on the content and/or format of the report. If you have any queries or comments, please contact nrg.south@environment-agency.gov.uk.

Minimise the amount of natural resources used

Energy use

The UK nuclear industry is a net generator of energy, generating approximately 70 terawatt hours (TWh) of electricity nationally in 2012 (including Scotland) and only using 9% of this[1]. The nuclear industry in England and Wales uses 10% less total energy now than in 2005 when reporting began.

Total energy use



The amount of energy the industry uses depends upon the activities taking place at each of the sites, the amount of electricity produced at power stations, throughputs of other plant and simple things like the weather. In 2012 the UK nuclear industry generated slightly more energy than in 2011. Total energy use in the industry in England and Wales has fluctuated in recent years, and decreased slightly in 2012, despite the increase in power generation.

Operators are continually reviewing their energy use and seeking to reduce it. The industry has developed a range of initiatives, including energy efficiency and reduction plans, more energy efficient lighting and heating and reviews to identify and improve inefficient equipment and processes. The reduction in total energy use in 2012 is mainly attributable to one reactor at Wylfa closing down and to a lesser extent the two reactors at Oldbury, as well as a reduction in usage at Heysham 1.

1 DECC Electricity: chapter 5, Digest of United Kingdom energy statistics (DUKES) https://www.gov.uk/government/publications/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

Variable speed drives used at Springfields

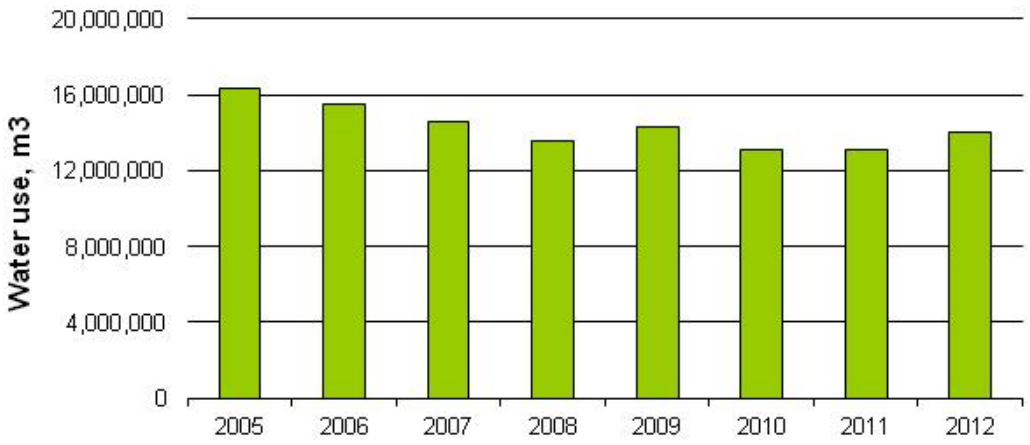
Courtesy of Springfields Fuels Ltd

Consultants surveyed the Springfields Compressor House and identified an opportunity to save energy by using variable speed drives (VSD) on the cooling water pumping system. The drive controller varies the speed of the pumps in order to maintain a constant pressure as compressors turn on and off. Prior to installation of the VSD, the pumps would run at a constant rate calculated based on maximum cooling water demand (all compressors running).

Water use

The nuclear industry has reduced its water use by approximately 14% since 2005. The main contributors to this reduction were the sites operated by Magnox Ltd. These sites (except Wylfa) have ceased electricity generation in the last ten years and therefore no longer require water to support reactor operation. However, the decline in water use has levelled off in recent years. Some nuclear sites use water in their production and safety-related processes and equipment. This means that for these sites, the scope for reducing water use is limited to the small proportion of water not used in production or operational facilities such as offices.

Total water use



The increase in water use in 2012 is mainly attributable to an increase in reported water use at the AWE sites. This is partially the result of improved water use monitoring at AWE Burghfield. Water use at Sellafield represents around 43% of the 2012 industry total; however the amount of water used at the site did fall slightly in 2012.

Most sites have water-use reduction plans and many have introduced water-saving initiatives. Many sites have also installed continuous water-use monitoring systems which are used to help with early identification of leaks. Water monitoring and leak detection work is at the top of the leak-management hierarchy, which aims primarily to avoid leaks through prevention at source. Leak management is a crucial way that sites can reduce unnecessary water loss.

Water use reductions at Magnox sites

Significant reductions in water use were achieved at the Dungeness A and Sizewell A sites in 2012. The reductions at Dungeness A were partially the result of the ownership of a facility being transferred to Dungeness B as well as a programme of leak repairs. Water usage did increase at Dungeness B in 2012 but this was only by about 30% of the reduction seen at Dungeness A. At Sizewell A in Suffolk, the operator implemented a rationalisation of the steam heating system which, in addition to changes to the work being carried out at the site, resulted in a 36% water saving at Sizewell A in 2012.

Recognise the impact of climate change

As with other industries, the nuclear industry contributes to climate change and is also susceptible to its impacts.

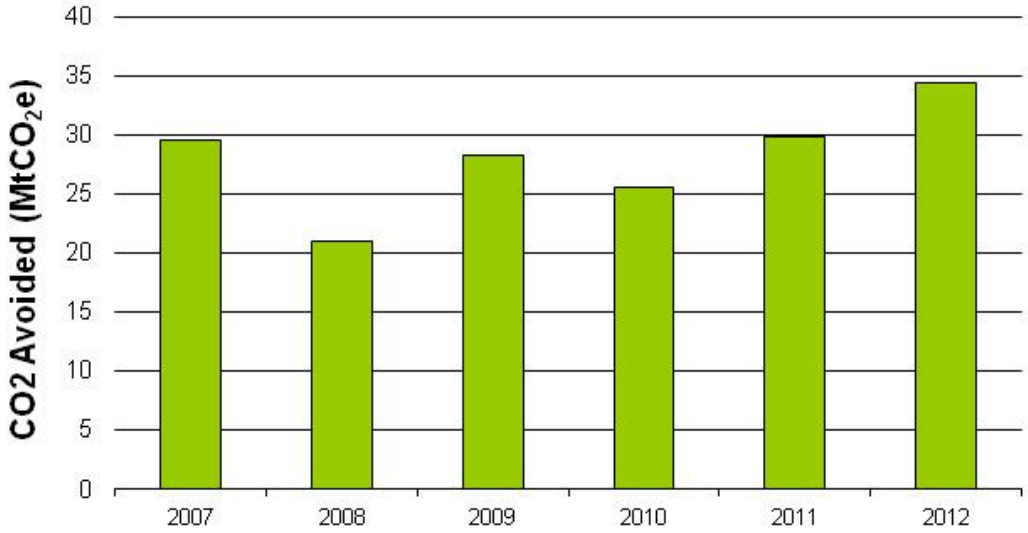
Reducing the impact of climate change

The nuclear industry provides electricity to the UK grid. In 2012 the industry generated 19% of the UK's electricity[2] (including data for Scotland). Nuclear power generation contributes significantly less carbon dioxide (CO_2) to the atmosphere than electricity generated using fossil fuels. In England and Wales, the amount of electricity generated in nuclear power stations was 49.2 TWh in 2012. If the same amount of energy had been produced in fossil fuel power stations, approximately 35 million tonnes of CO_2 (equivalent), would have been produced. This is a significant saving, equivalent to over a quarter of the UK's emissions of CO_2 from transport in 2011[3] and is presented below as CO_2 avoided.

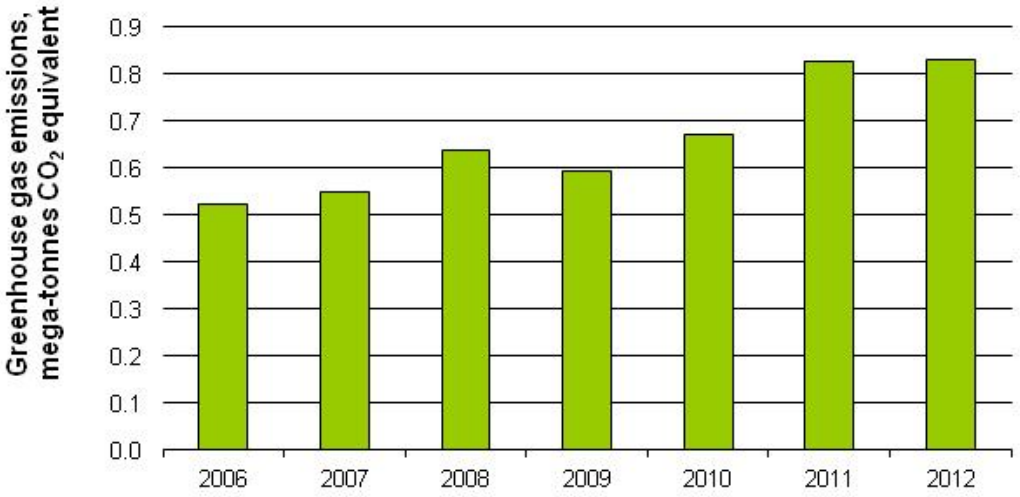
2 DECC Electricity: chapter 5, Digest of United Kingdom energy statistics (DUKES) https://www.gov.uk/government/publications/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

3 DECC 2012 UK Greenhouse Gas Emissions, Provisional Figures and 2011 UK Greenhouse Gas Emissions, Final Figures by Fuel Type and End User https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/193414/280313_ghg_national_statistics_release_2012_provisional.pdf

Carbon dioxide avoided



Total greenhouse gas emissions



The greenhouse gas emission chart shows that the amount of emissions in 2012 from the nuclear industry remained at a similar level to 2011. The rise from 2010 to 2011 was due partly to the methods sites use to calculate greenhouse gas emissions as described in the previous sector plan report for 2011.

In many sub-sectors of the nuclear industry, the majority of greenhouse gas emissions result from energy required to power major plant to support energy generation and other key activities. Only a small amount (less than 1% in some cases) is associated with minor plant, lighting and heating. At Wylfa power station for example, the greatest fuel oil use, and therefore most greenhouse gas emissions, are associated with testing and maintenance of the site's safety-related plant.

Most nuclear sites have plans in place to target and reduce CO_2 emissions. The industry recognises that this is important and is continuing to work to improve its performance in this area.

Some sites managed to reduce their greenhouse gas emissions significantly in 2012. For example, Dungeness A in Kent reduced its greenhouse gas emissions by 37% in 2012 by reducing energy and gas oil use. This is driven by the site's Energy Efficiency Plan as more areas are decommissioned.

Adapting to climate change

The nuclear industry is constantly reviewing how best to manage its own operations in order to adapt to the impacts of climate change. This includes planning how to respond to a wide variety of natural events such as flooding, coastal erosion, drought, storms, extreme temperatures and high winds. Climate change has the potential to affect the operation of a power plant in a number of ways; for example, delivery of essential goods could be interrupted by weather events such as floods, or water availability might be affected by drought.

The industry continued to take action during 2012 in response to the accident at Japan's Fukushima nuclear power plant in March 2011, which was caused by a large earthquake and tsunami. Operators of all licensed nuclear sites in the UK have carried out safety investigations at their sites to determine their resilience to extreme natural events and are now making improvements where they have been identified. To date, investigation of the circumstances of the Fukushima accident has not revealed any gaps in scope or depth of the Safety Assessment Principles for nuclear facilities in the UK[4].

Minimise discharges to air and water

Radioactive discharges to air and water are regulated by the Environment Agency through use of permits. Permits require operators to implement 'Best Available Techniques' (BAT) to minimise any releases of radioactivity to the environment. All discharges of radioactivity to air and water in 2012 were below the levels permitted. A fuller description of radioactivity and the discharges from the nuclear industry can be found in the UK Strategy for Radioactive Discharges.

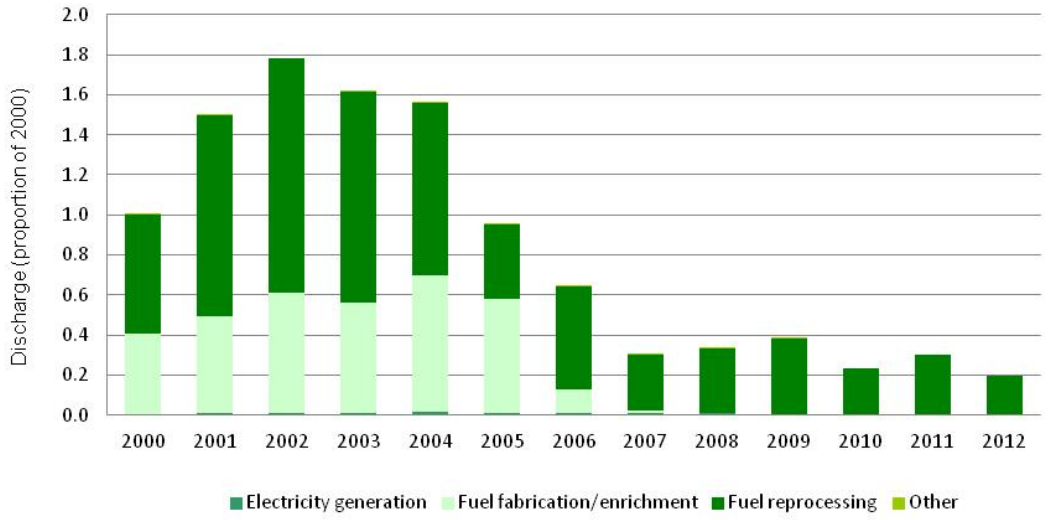
The nuclear fuel reprocessing sub-sector contributes a large proportion of the UK emissions of radioactivity to air and water. In 2012 some discharges to air and water from this sub-sector decreased in comparison to 2011 and overall discharges remain low in comparison to historic levels. The short-term increases seen in 2011 were due to a combination of factors, including an increase in the amounts of fuel reprocessed at Sellafield in 2011, the types of fuel being processed, hazard reduction programmes and decommissioning activities. In order to reach the 2020 discharge targets (as described in the UK Strategy for Radioactive Discharges), many technical approaches are being considered by the nuclear industry with the ultimate aim of transferring or transforming used fuel into a safer state and reducing emissions in the long-term.

Discharges to water

Radioactive discharges to water remain low and on target to meet the commitments set out in the UK Strategy for Radioactive Discharges. This specifies expected outcomes to be achieved by 2020. One of the outcomes of the UK Strategy is to progressively and substantially reduce liquid radioactive discharges. Radioactive discharges from the nuclear industry are in line with, or reducing faster than, the strategy's projections.

[4] www.hse.gov.uk/nuclear/fukushima/final-report.pdf

Trends in radioactive discharges to water



*Discharge of each radioactive substance weighted by dose impact

Notes:

i) The total discharge of each radionuclide from each sub-sector is multiplied by a specific 'dose per unit release' factor which takes into account the different health effects of different radionuclides and the likely concentration in the environment. The total is then compared to the 2000 total to show the trend in this indicator over time. The graph is therefore comparative and does not have any units.

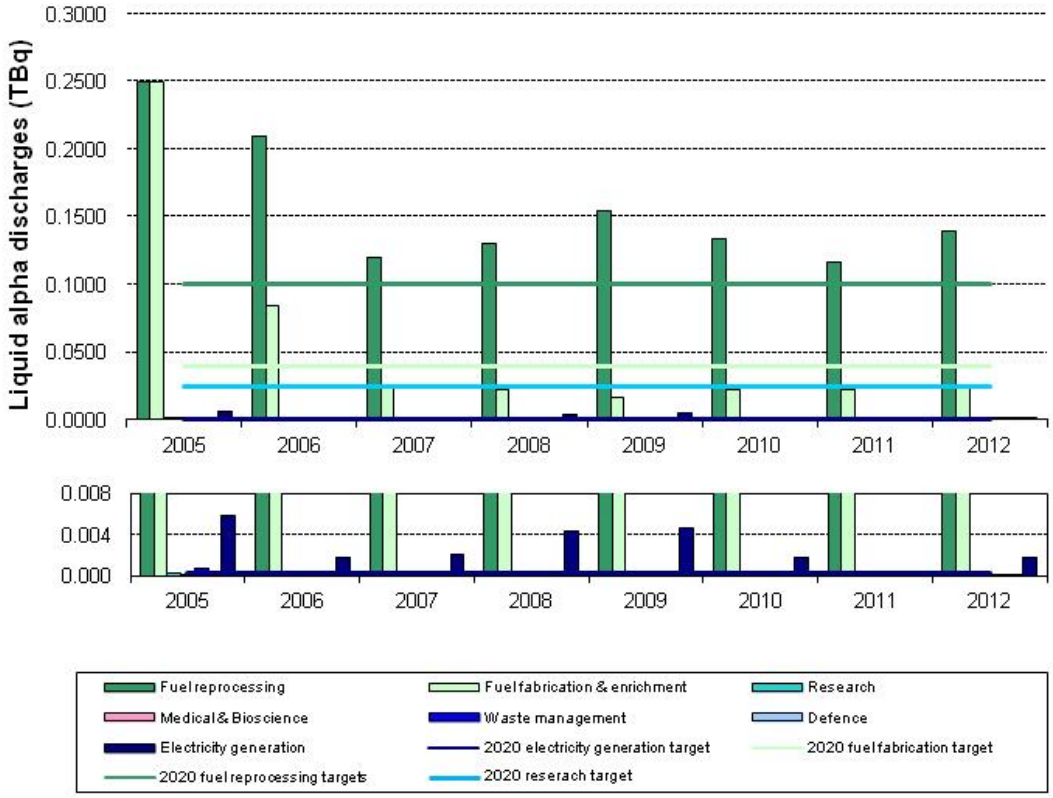
ii) The 'other' category includes the medical and bioscience, defence, research and waste management sub-sectors.

iii) Discharges from the 'electricity generation' and 'other' sub-sectors are too low to be seen on the graph.

Since 2007, discharges of radioactivity to water have consistently been less than half the amounts discharged in the year 2000. Discharges to water are dominated by the fuel reprocessing sub-sector. A simple numerical link between the total quantity of fuel to be reprocessed and discharges cannot always be made and more sophisticated analysis is required, although most of the discharges result from reprocessing.

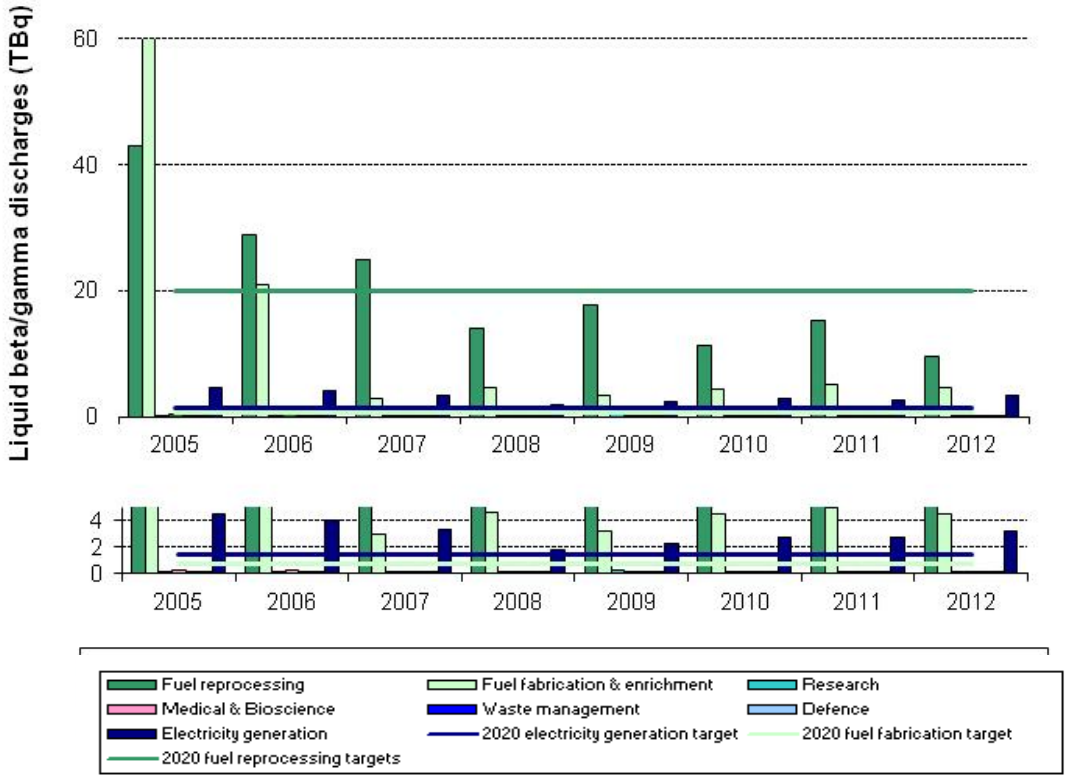
Many factors need to be taken into account when examining discharges associated with fuel reprocessing and, in addition, there are discharges from hazard reduction and decommissioning activities that are not linked to reprocessing rates. It is in the interest of the UK and the environment that fuel reprocessing continues, in order to reduce the long-term hazard posed by large amounts of stored nuclear fuel. Discharges decreased in 2012; one of the main reasons for this was the smaller amount of reprocessing carried out in the year.

Annual liquid alpha discharges



Liquid alpha discharges increased slightly in 2012 as a result of discharges associated with legacy waste treatment within the fuel reprocessing sector. This sector is the main contributor of liquid alpha discharges. There were also increased discharges of alpha from the electricity sub-sector, mainly as a result of permitted discharges originating from the Hinkley A fuel ponds which are being decommissioned. Overall there has been a large decrease in liquid alpha discharges since 2005, with discharges in most sub-sectors now being less than half of the 2005 level, with some already below the 2020 targets.

Annual liquid beta/gamma discharges (excluding tritium)

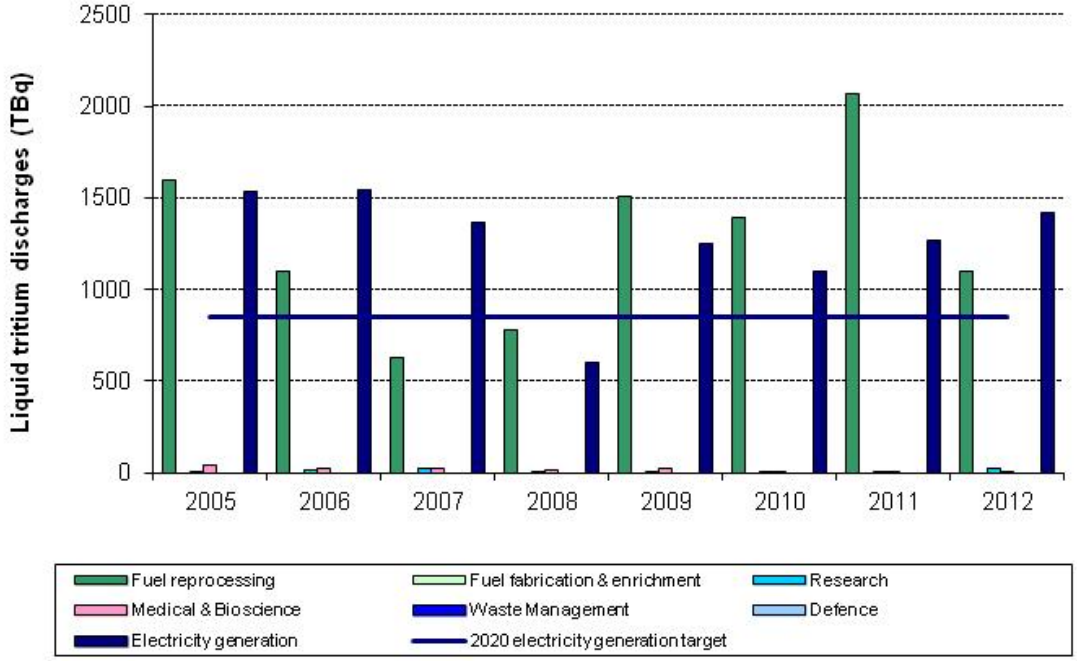


Note:
There are no targets in the UK radioactive discharge strategy for liquid beta/gamma discharges from the research, medical and bioscience or waste management sub-sectors.

Liquid beta/gamma discharges in 2012 were around 75% of those in 2011, despite a 20% increase in discharges from the electricity generation sub-sector (this sector contributes approximately 20% of the total beta/gamma discharges). The reduction was mainly the result of a reduction in discharges from the fuel reprocessing sub-sector, with a smaller reduction from the fuel fabrication and enrichment sub-sector. This is a result of a decrease in fuel reprocessing at Sellafield (fuel reprocessing sub-sector) and completion of activities such as processing technically complicated residues in the fuel fabrication and enrichment sub-sector.

The 2020 target for the defence sub-sector is 0.002 TBq/yr, and the discharges measured for this sub-sector show it has already been achieved. It should be noted that the 2020 targets for the electricity generation and fuel fabrication sub-sectors do not take account of current extended lifetimes of some power stations, potential new nuclear power stations, or the change at Springfields which was long-term leased to Westinghouse in 2010.

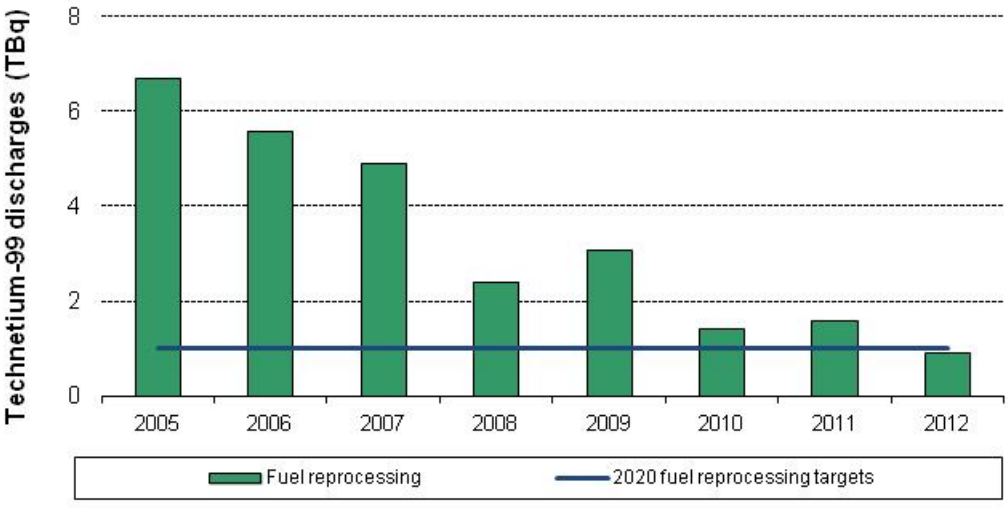
Annual liquid tritium discharges



Liquid tritium discharges continue to fluctuate; total discharges in 2012 were almost 25% less than in 2011. The decrease in discharges from the fuel reprocessing sub-sector in 2011 was due to the decrease in reprocessing rates in 2012 compared to 2011, as well as the annual fluctuations that can be expected due to the range of reprocessing, decommissioning and hazard reduction activities being carried out.

In 2012, discharges from electricity generation and other sub-sectors increased slightly, the former due to increased electricity production. The decrease from the medical and bioscience sub-sector since 2009 is due to radiochemical production ceasing at GE Healthcare's Maynard Centre and the start of decommissioning of redundant facilities. It should be noted that the 2020 targets for the electricity generation sub-sector do not take account of current extended lifetimes of some power stations or potential new nuclear power stations.

Annual technetium-99 discharges to water from reprocessing



Note: The UK radioactive discharge strategy has technetium targets solely for the fuel reprocessing sub-sector.

Technetium-99 discharges in 2012 were almost half of those made in 2011. Again, this is due to the decrease in reprocessing rates in 2012 compared to 2011, and annual fluctuations that can be expected due to the range of reprocessing, decommissioning and hazard reduction activities being carried out. There has been a large decrease (approximately 93%) in technetium-99 discharges to water from the fuel reprocessing sector since 2005.

Harwell Replacement Effluent Treatment Plant

Courtesy of RSRL Ltd

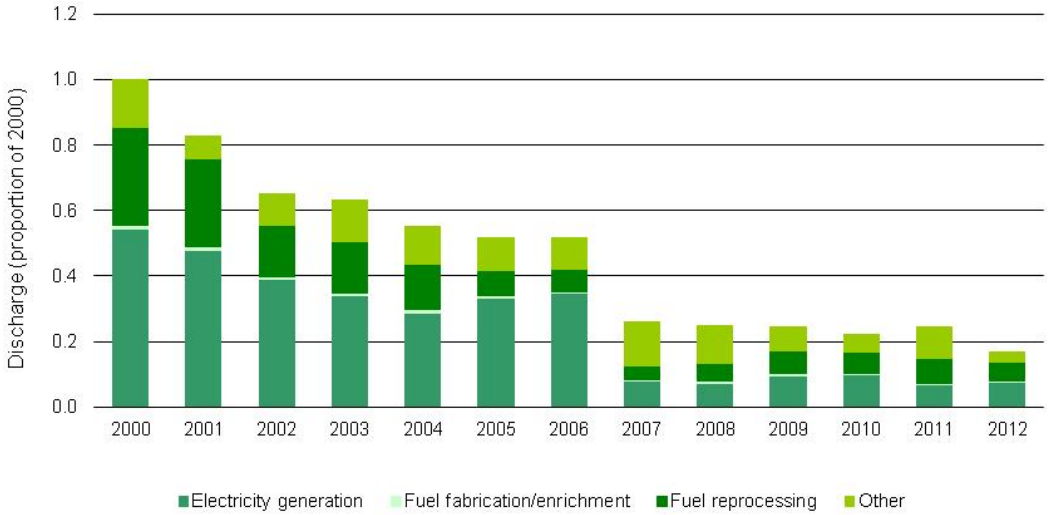
The RSRL Harwell nuclear site has been undergoing decommissioning since the 1990s and many facilities have been closed down. The reduction in liquid effluent arisings on site has continued steadily and the old Liquid Effluent Treatment Plant (LETP) is now oversized to meet the site's current needs.

RSRL therefore plans to close the LETP and has been commissioning a small compact Replacement Effluent Treatment Plant (RETP) within the solid waste treatment complex, where most of the remaining arisings on site will come from. The RETP is a sealed plant based around two solids settling tanks and two waste water evaporators that will reduce discharges by removing nearly all solid phase materials from the aqueous waste stream.

Discharges to air

Total radioactive discharges to air from the nuclear industry remained low in 2012. The overall trend since 2000 has been a significant reduction, with a levelling off since 2007.

Total assessed radioactive discharges to air



*Discharge of each radioactive substance weighted by dose impact

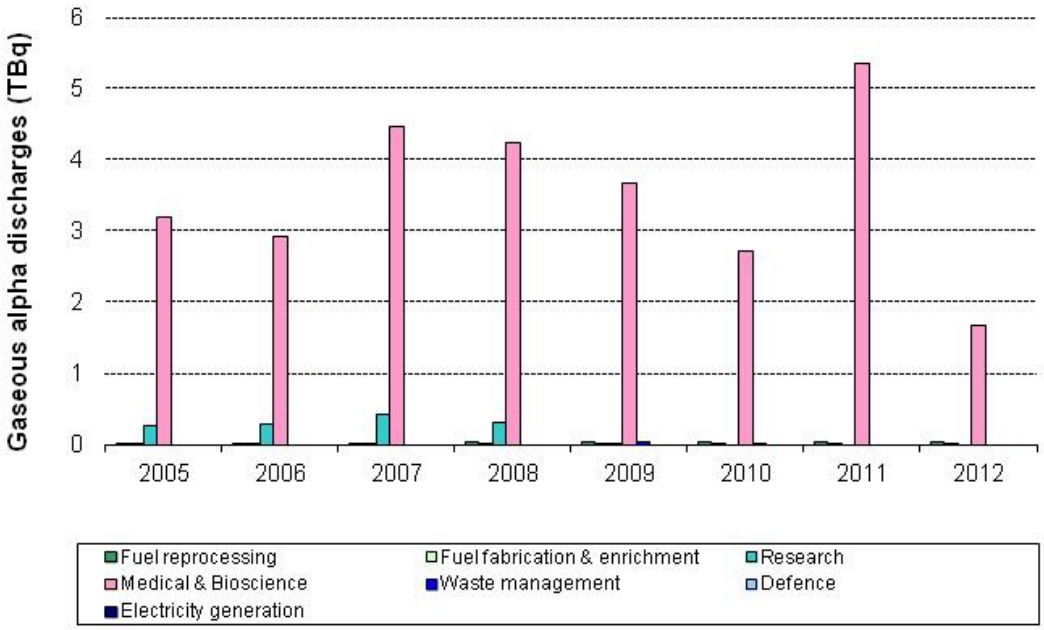
Notes:

i) The total discharge of each radionuclide from each sub-sector is multiplied by a specific 'dose per unit release' factor which takes into account the different health effects of different radionuclides and the likely concentration in the environment. The total is then compared to the 2000 total to show the trend in this indicator over time. The graph is therefore comparative and does not have any units.

ii) The 'other' category includes the medical and bioscience, defence, research and waste management sub-sectors.

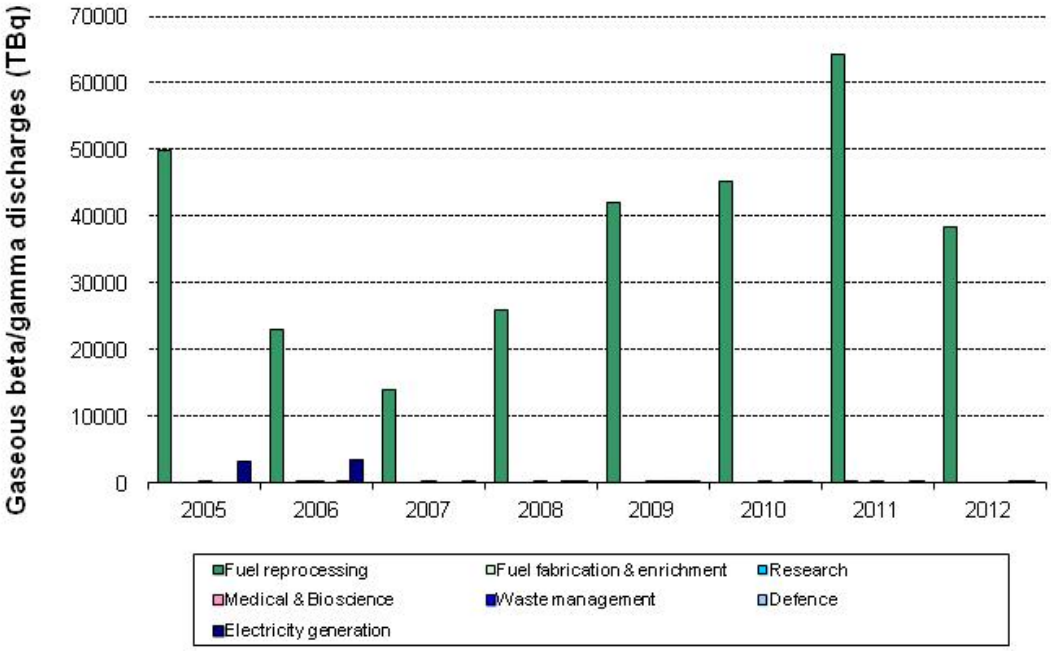
Discharges to air decreased in most sub-sectors in 2012, with the largest decreases in the electricity generation and fuel reprocessing sub-sectors. The decrease in discharges in the fuel reprocessing sub-sector was due to the smaller amount of fuel reprocessed in 2012 compared to in 2011.

Annual alpha discharges to air



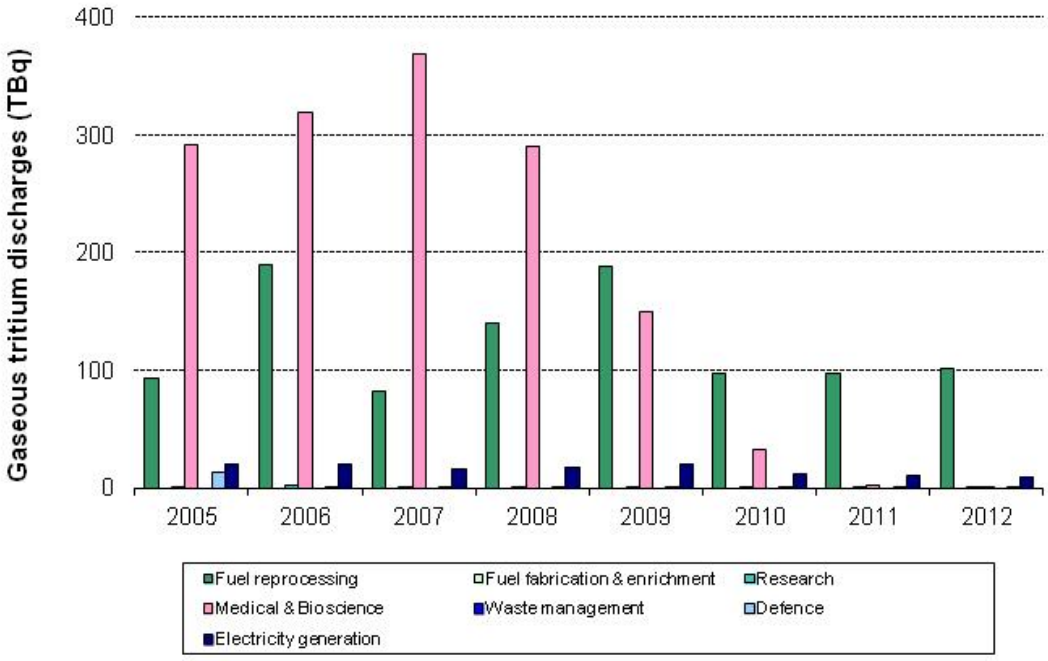
Gaseous alpha discharges continue to be dominated by those from the medical and bioscience sub-sector. The predominant discharge is radon-222 from a redundant radium source production line at GE Healthcare's Grove Centre. The level of discharges decreased in 2012 following the increase in emissions in 2011. This facility is currently programmed for decommissioning in 2016.

Annual beta/gamma discharges to air (excluding tritium)



Gaseous beta/gamma discharges continue to be dominated by those from the fuel reprocessing sub-sector. Discharges decreased in 2012 compared to 2011 and were mainly due to the smaller amount of reprocessing in 2012 compared to 2011.

Annual tritium discharges to air



The level of gaseous tritium discharges was very similar in 2012 to those made in 2011. The most striking feature in the trends of gaseous tritium discharges since 2005 is the decrease in discharges from the medical and bioscience sub-sector from 2009. This is due to radiochemical production ceasing at GE Healthcare's Maynard Centre and the subsequent start of decommissioning of the redundant facilities.

Radiation doses due to radioactive discharges

Radiation doses to the most exposed members of the public due to discharges from nuclear sites in England and Wales are well within the EU and UK legal limit of 1 mSv per year (Ionising Radiations Regulations, 1999)

Radiation doses are determined primarily by monitoring the concentration of radionuclides in food and the environment around nuclear sites. The results are published annually in the Radioactivity in Food and the Environment (RIFE) report. The Environment Agency uses this data, together with information on the habits of people in the vicinity of the nuclear sites, (such as how much of those foods people are likely to eat or how much time people spend in particular locations), to assess radiation doses affecting people as a result of discharges.

Radiation doses change from year to year and are mostly caused by variations in the form and concentrations of radioactivity. However, doses are also affected by changes in people's habits, for example in the food they eat. The 'total dose' assessment method makes use of information on habits around the nuclear sites and, as well as the dose from discharges, also includes the dose from exposure to direct radiation by being near to the site. Members of the public most exposed to radiation near all nuclear sites in the UK are known as the 'representative person'.

Considering doses from discharges alone, during 2012 the representative persons who received the largest doses from liquid and gaseous discharges were those at Sellafield. Doses from liquid discharges are due to the effects of current and past liquid discharges in seafood and the environment. However, the doses reported in the table below exclude the effects of enhanced concentrations due to the legacy of

discharges of naturally occurring radionuclides from a phosphate processing works near Whitehaven. If these doses are included, the highest dose in 2012 from liquid discharges is 0.33 mSv at Sellafield and Whitehaven.

Highest doses to representative persons in England and Wales due to current and past discharges[5]

	2009	2010	2011	2012
Liquid discharges (mSv)[a]	**0.20**	**0.18**	**0.15**	**0.14**
Gaseous discharges (mSv)[b]	**0.029**	**0.022**	**0.022**	**0.016**

[a] largest doses as a result of liquid discharges were at Sellafield from fish and shellfish consumption and external intertidal areas (*excluding* naturally occurring radionuclides)

[b] largest doses as a result of gaseous discharges were from terrestrial foods, external dose and inhalation dose at Sellafield in 2009, 2010 and 2012; and at Amersham in 2011.

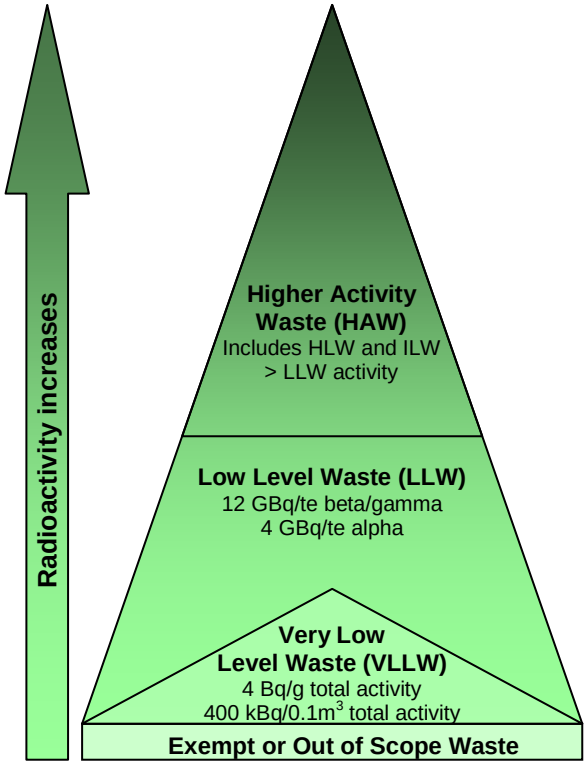
The assessments of total dose reported in RIFE 18 (including the doses both from discharges and from direct radiation from proximity to a nuclear site) show that the highest dose in 2012 in England and Wales (0.22 mSv) was to people living near Amersham. This is well below the public dose limit of 1 mSv/year. The majority of this dose is due to direct radiation and not discharges. Total dose near Amersham has decreased slightly since 2004. The most marked decreases in total dose since 2004 are on the Cumbrian coast (Sellafield, Whitehaven and Drigg); at Berkeley and Oldbury; at Cardiff; at Dungeness and at Sizewell.

Minimise and manage solid waste

The nuclear industry generates a range of solid wastes, both radioactive and non-radioactive, as a result of activities at its sites. Operators are required to minimise the production of all wastes. Most of the waste is non-radioactive and comes from construction and demolition projects. Radioactive wastes are disposed of in accordance with permits granted by the Environment Agency.

Radioactive wastes

Solid radioactive waste is divided into four main categories: High Level Waste (HLW), Intermediate Level Waste (ILW), Low Level Waste (LLW) and Very Low Level Waste (VLLW) according to the amount of radioactivity it contains and the heat it produces. Intermediate Level Waste (ILW) and High Level Waste (HLW) are often referred to together as Higher Activity Waste (HAW) (see diagram). HLW is not included in the scope of the Nuclear Sector Plan. Further details on types of radioactive waste in the UK can be found in the UK National Radioactive Waste Inventory (the summary document provides a useful introduction). A description of the Government's programme to



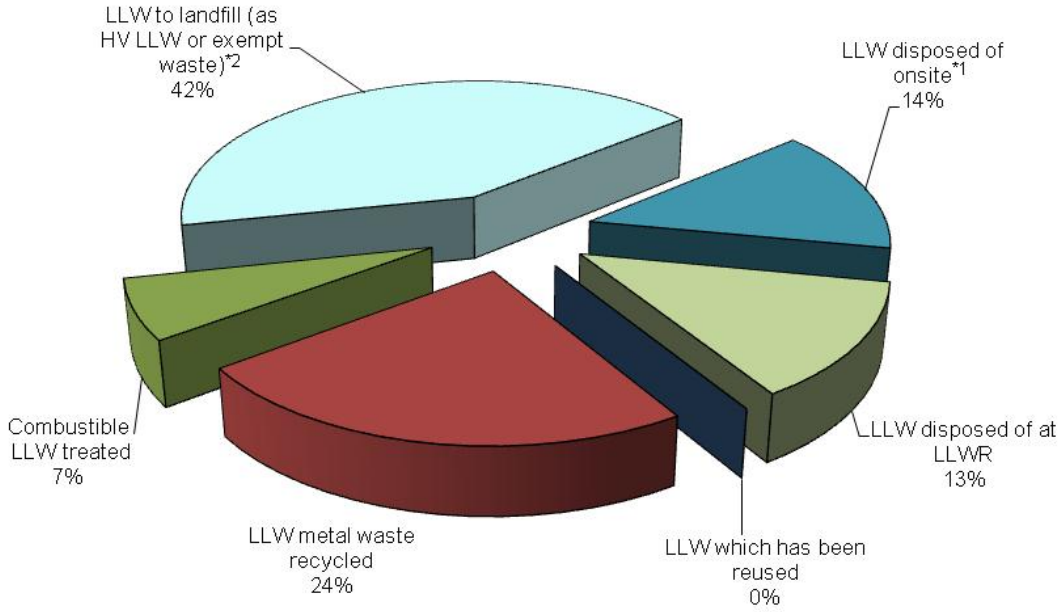
[5] RIFE 15, 16, 17 & 18 - Radioactivity in Food and the Environment, 2009, 2010, 2011 and 2012 respectively (Table 1.4)

find and implement a solution to the management of higher activity waste can be found at 'Managing Radioactive Waste Safely'.

In 2007, a more flexible framework for the disposal of low-level radioactive waste was introduced by the Government. It allows for the disposal of some categories of LLW and VLLW to permitted landfill sites. Since 2010 this process has been regulated under the Environmental Permitting Regulations 2010 in England and Wales. These regulations specify that the landfill site operator must hold an Environmental Permit issued by the Environment Agency in order to accept LLW. The use of landfills for LLW and VLLW will extend the lifetime of the national Low Level Waste Repository.

Most operators have an Integrated Waste Strategy, which provides an overall plan for dealing with all types of wastes produced on site. At present, the majority of sites have these strategies in place although some are still developing them. Operators are continuing to update their strategies to address individual waste streams and how the waste management hierarchy is being employed to deal with them.

Management of Low Level Waste in 2012



*1 disposal at the Calder Landfill Segregated Area (Sellafield)
*2 High volume - very low level waste that can be disposed of to specified land fill sites

The Low Level Waste Repository (LLWR) near Drigg is a national asset with limited capacity for the total anticipated volumes of LLW. The nuclear industry is being encouraged to reduce the amount of waste it sends for disposal at the LLWR by implementing the waste hierarchy (reduce, reuse, recycle) and by using other disposal routes. In 2012 the nuclear industry avoided sending 87% of its low level waste to the LLWR (based on figures provided by operators) by recycling, using incinerators for certain wastes or using permitted landfill sites. This figure is the same as that in the 2011 performance report.

However, errors in some operators' submissions in 2010 and 2011 have been identified that require the figures in the 2010 and 2011 performance reports to be revised. In the 2010 and 2011 performance reports we reported that 78% and 87%

respectively of LLW had avoided being sent to the LLWR. The revised figures for 2010 and 2011 have been calculated as 75% and 84% respectively. Therefore the 87% figure reported for 2012 represents a 3% decrease in the total LLW sent to the LLWR on the 2011 figure.

In 2012 the amount of LLW disposed to the LLWR was just over 3000 m^3 which is less than half that disposed to the LLWR in 2009.

	2009	2010	2011	2012
Volume of LLW consigned to LLWR for disposal (m^3)	**6255**	**6304**	**4995**	**3067**

Recycling of the Berkeley boilers

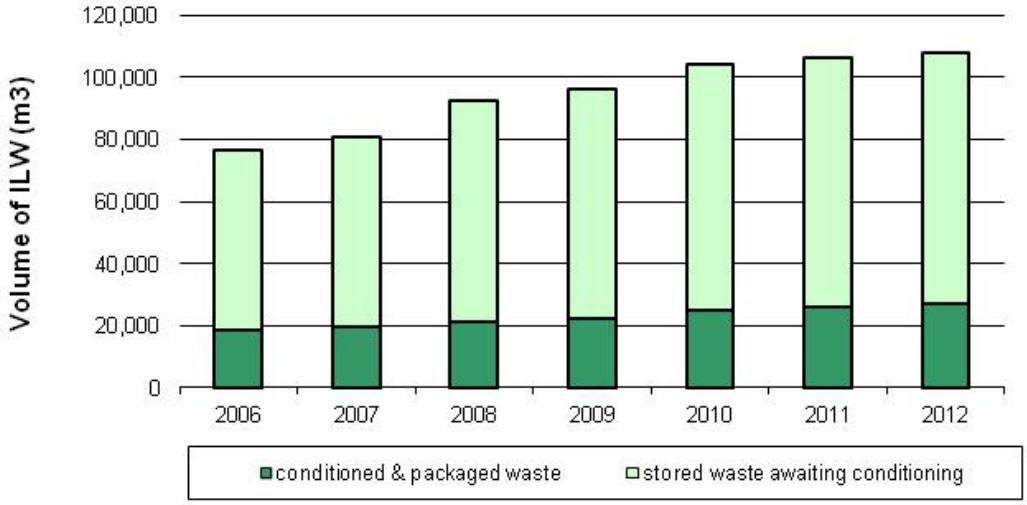
Courtesy of Magnox Ltd

Fifteen large boilers each weighing 300 tonnes and contaminated with low levels of radioactivity had been stored at the Berkeley site since electricity generation ceased in 1989. Magnox determined that recycling the boilers was the most desirable outcome. The boilers were subsequently safely transported to Studsvik's facility in Sweden, with the first five boilers shipped in 2012. Ninety per cent of the metal from the boilers was released for re-use in the metal market, and half of the secondary waste was able to be disposed as VLLW.

Intermediate Level Waste (ILW)

Management of ILW is an area of waste management that still needs improving. Some progress has been made during 2012 in the conditioning and packaging of 'legacy ILW' within the nuclear industry. These are wastes that are not yet in a final form which can be safely disposed of.

Total volume of raw and conditioned/packaged ILW [6]



Generation of ILW is increasing as sites undergo decommissioning and other activities. Since 2006 the proportion of the total volume of ILW that has been conditioned and packaged in England and Wales has remained under 30% of the wastes stored on the sites. The industry is looking at ways to improve this performance. The conditioning of ILW at Sellafield was responsible for the increase in volume of conditioned waste in 2012.

The ability to progress to final disposal of ILW is constrained by the availability of a national Geological Disposal Facility (GDF). The nature of the disposal facility for higher activity wastes will determine the specific requirements for packaging of the wastes that will be sent there. Currently a disposability assessment process exists whereby the Nuclear Decommissioning Authority can issue a Letter of Compliance for higher activity wastes that are packaged into a passive, disposable form.

Some sites have ILW that is not destined for final disposal in a deep geological facility and this waste may have different conditioning and packaging requirements. The nature of ILW means that significant work is usually needed before waste is moved. Sites are also starting to tackle some of the more difficult-to-treat ILW, which presents a significant engineering challenge to the industry. The industry continues to research methods and technologies to treat various types of ILW through cross-industry groups such as the Nuclear Waste Research Forum[7].

Retrieval of ILW at Bradwell

Intermediate Level Waste (ILW) arising at the site was stored in vaults and this waste accumulated over time. Magnox has now started to retrieve this waste and plans to store the waste in large, heavily shielded cast iron containers on the site in a new purpose built store, with eventual disposal in the proposed GDF. The Environment Agency, the Office for Nuclear Regulation and the Nuclear Decommissioning Authority are working with Magnox to ensure that the waste is in an optimised condition for interim storage and eventual disposal.

6 Data is provided by the NDA and is based on the 2010 UK Radioactive Waste Inventory and waste package numbers at 1 April 2012 (provided by Site License Companies).

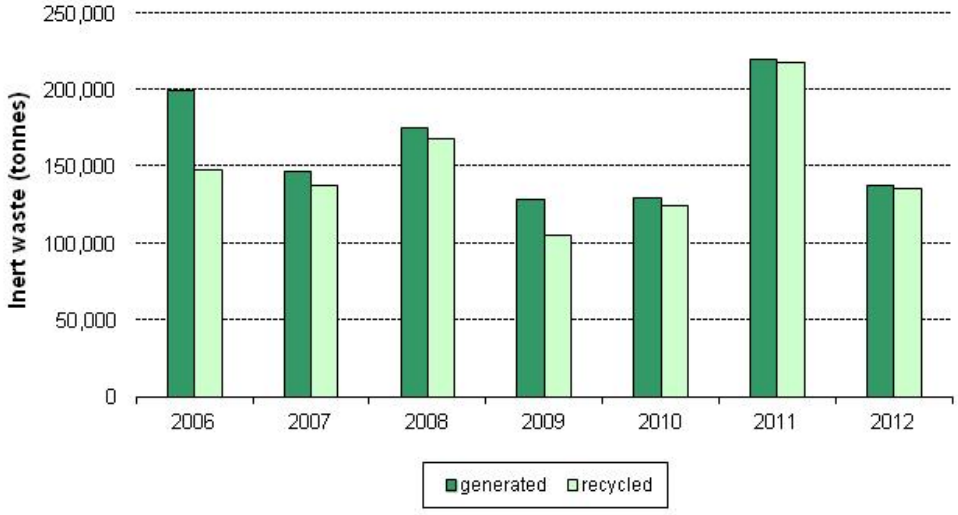
7 http://www.nda.gov.uk/research/nwrf.cfm

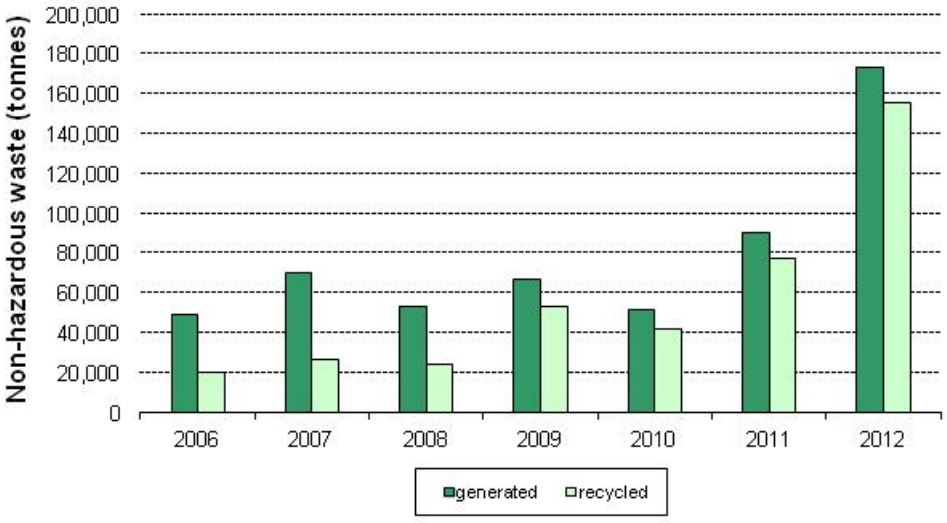
Non-radioactive wastes

The bulk of the waste generated by the nuclear industry is non-radioactive. Non-radioactive waste is divided into three categories according to its hazardous nature and other characteristics: hazardous waste, inert waste and non-hazardous waste.

Hazardous waste is waste which is harmful to human health or the environment and so is disposed of by specific technical treatment or to specialist landfill. Examples include asbestos, solvents, oil and pesticides. Inert waste is waste that has no hazardous properties and which does not undergo any significant physical, chemical or biological transformations, for example sand. Non-hazardous waste is waste that, while it doesn't have any hazardous properties, is not inert and could cause problems if not dealt with properly due to the fact that it may biodegrade. Examples of non-hazardous waste include paper, cardboard and plastic.

Amounts of non-hazardous and inert waste generated and recycled





In 2012 the amount of inert waste generated decreased to around 65% of the 2011 total. However, the total amount of non-hazardous waste generated at nuclear sites increased to almost double the figure for 2011, mainly as a result of waste generated at the AWE sites. The amount of waste produced is dependent upon the activities occurring on sites and in 2012 there was a large increase (almost 300%) in non-hazardous waste (mainly soil) generated from decommissioning activities at the AWE sites.

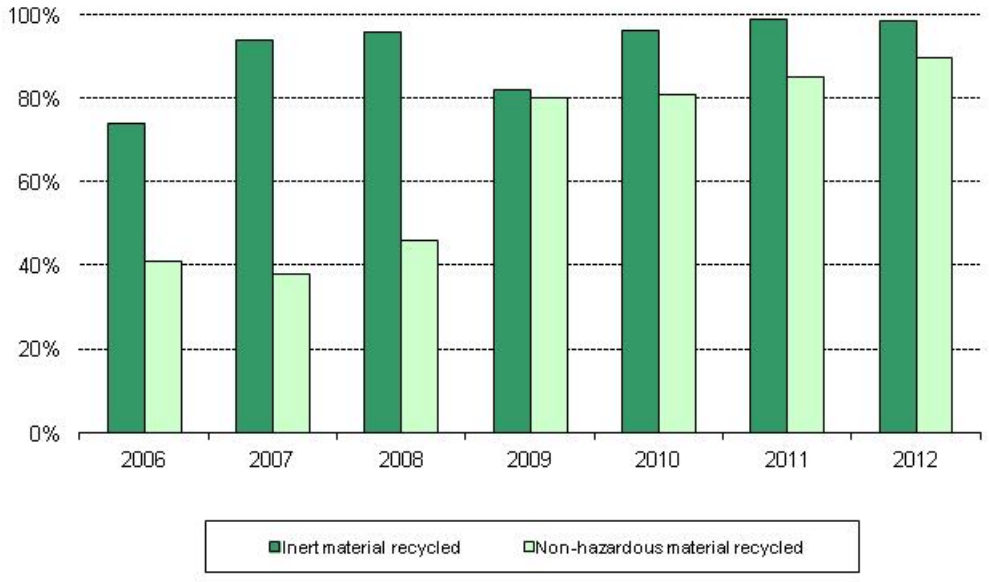
Across the sector, the recycling rates for inert waste have remained high at 99% in 2012. Despite the increase in non-hazardous waste in 2012, recycling rates increased from 85% to 90% for non-hazardous waste as sites improved the way they manage these wastes in routine work and in large projects.

Demolition of the Bradwell Turbine Hall

Images courtesy of Magnox Ltd

The skyline at the Bradwell site in Essex changed forever in 2012 when a 15-month project to demolish the former power station's turbine hall was completed. When built, the turbine hall space occupied the same size space as a standard football pitch. The decommissioning and demolition generated over 12,000 tonnes of non-radiological waste which, through segregation, allowed for a recycling rate of 95%. Of the total, only 630 tonnes were disposed of to landfill. Magnox worked closely with contractors to ensure maximum recycling rates were achieved and any environmental impact was minimised. Through a 'lead and learn' approach, learning and best practice will be shared with other Magnox sites.

Percentage of inert and non-hazardous material recycled



The nuclear industry has a very high rate of recycling for inert and non-hazardous wastes (99% and 90% respectively). In England in 2009, 52% of waste generated by the entire commercial and industrial sector was recycled or reused[8]. The nuclear industry is therefore doing well in comparison to other industrial sectors. Across the

[8] http://www.defra.gov.uk/statistics/environment/waste/wrfg03-indcom/. Note that similar data is not yet available for 2010-2012.

industry the majority of the inert waste created is reused either on or off the site of origin. Inert waste is often used as engineering infill for voids created through decommissioning, or for future building projects on site. Sites are continuing to apply the waste hierarchy, segregating wastes carefully to allow recycling to take place.

Demonstrate sound environmental management and leadership

Industry operators remain committed to working together and sharing their views and experience on good environmental performance. They are continuing to make good progress towards the goals set out in the Nuclear Sector Plan. Most operators have an environmental management system that has been independently certified to an international standard (ISO 14001), while others have chosen alternative arrangements to equivalent standards.

Where relevant, operators are continuing to work towards their corporate social responsibility (CSR) policy targets. These cover socio-economic commitments, sustainability, supplier partnerships, working with external stakeholders and social and community projects. The majority of operators have a specific CSR policy for their sites; others incorporate CSR into their sustainability policy. Several operators also have socio-economic development plans or policies and sustainable procurement policies.

Site operators are encouraged to involve local stakeholders. The Nuclear Decommissioning Authority (NDA) has developed guidance on what it expects from Site Stakeholder Groups (SSGs) and what support the SSGs can expect in return. Operators have stakeholder plans and well-established local liaison groups which meet regularly to discuss relevant local issues.

Manage land quality and biodiversity

Site operators have made progress in identifying land affected by chemical or radioactive contamination. In common with many sites in long-term industrial use, most contaminated land on nuclear sites is attributed to historical activities. Some sites have no contaminated land, while others have legacy contamination issues to manage. All sites are committed to avoiding any future land contamination. Where appropriate, sites have developed Land Quality Management Plans, which may involve monitoring programmes, mitigation and clean-up activities. The Environment Agency, Scottish Environment Protection Agency (SEPA) and the Office for Nuclear Regulation (ONR) are working with the industry to develop these plans.

Most nuclear sites have biodiversity action plans (BAPs) to manage or enhance the flora and fauna present on site or on surrounding land. As well as working on their own sites, many operators work in the local area to encourage biodiversity. The Winfrith site has Sites of Special Scientific Interest (SSSIs) within its boundary. These areas are managed by RSRL (Research Sites Restoration Limited) as part of its Heathland Management Plan, (which supplements its BAP) in consultation with Natural England. GE Healthcare's Maynard and Grove Centres have developed sustainable ground maintenance plans to encourage native plants and plants that require little watering, in order to reduce water use.

Sizewell B – Workers offer Darsham Marshes a helping hand

Workers from Sizewell B power station turned out to help clear long grass at Darsham Marshes in July 2012. Members of the Outage Team at Sizewell B spent a hot summer's day working in the marshes, as part of the EDF Energy 'Helping Hands' project.

The team was helping maintain the unique eco-system at Darsham Marshes, supporting the work of the Suffolk Wildlife Trust. The EDF Energy 'Helping Hands' project has been created to allow employees to help in the community by volunteering to support social, environmental and educational projects during company time.

Image courtesy of EDF Ltd

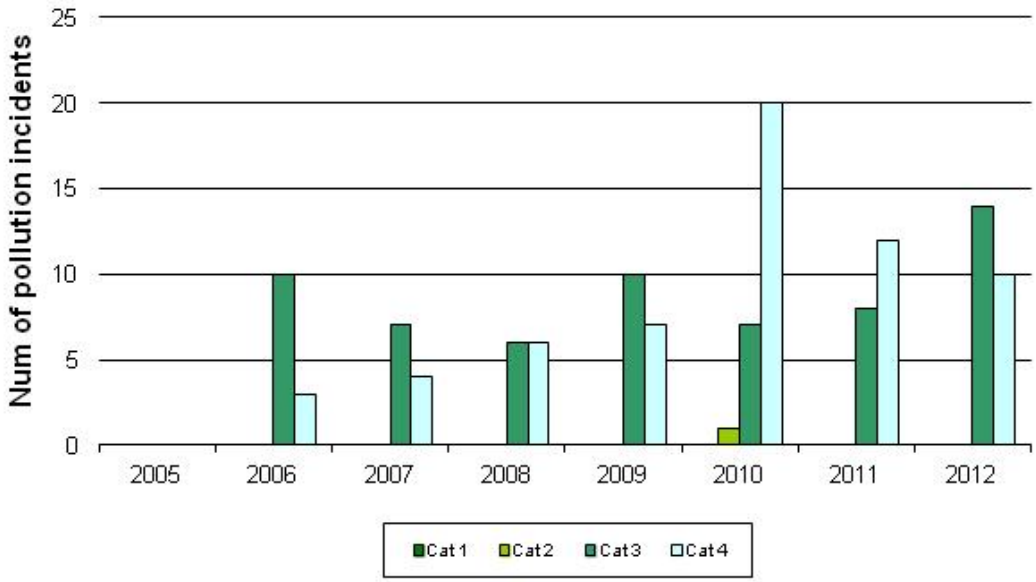
Improve or maintain a very high level of regulatory compliance

The nuclear industry continues to achieve a high standard of regulatory compliance. It is a heavily regulated industry, reflecting the significant hazards and risks associated with activities on its sites. The Environment Agency works closely with the industry and other nuclear regulators (particularly the Office for Nuclear Regulation) to ensure compliance and support improvements in performance. Non-compliances are rare and when they do happen, we are committed to responding promptly to understand how these occurred and how any future recurrence can be avoided.

All but one of the incidents at nuclear sites in the past seven years have had either no impact, or only minor impacts, on the environment (as categorised in the Environment Agency's Common Incident Classification Scheme (CICS)). The one exception is the misconsignment of radioactive waste from Sellafield to the Lillyhall landfill site.

This event was assigned a Category 2 CICS score (potential or significant impact) on the basis that it was a loss of control of radioactive waste; countermeasures were employed (removal of the radioactive waste and return to the Sellafield site) and it was a significant breach of Sellafield Ltd's environmental permit. The Environment Agency (with the Office for Nuclear Regulation) subsequently prosecuted Sellafield Limited for this event. The incident occurred in 2010, but was not reported in the 2010 Nuclear Sector Plan Environmental Performance Report as it had not been classified when that report was published.

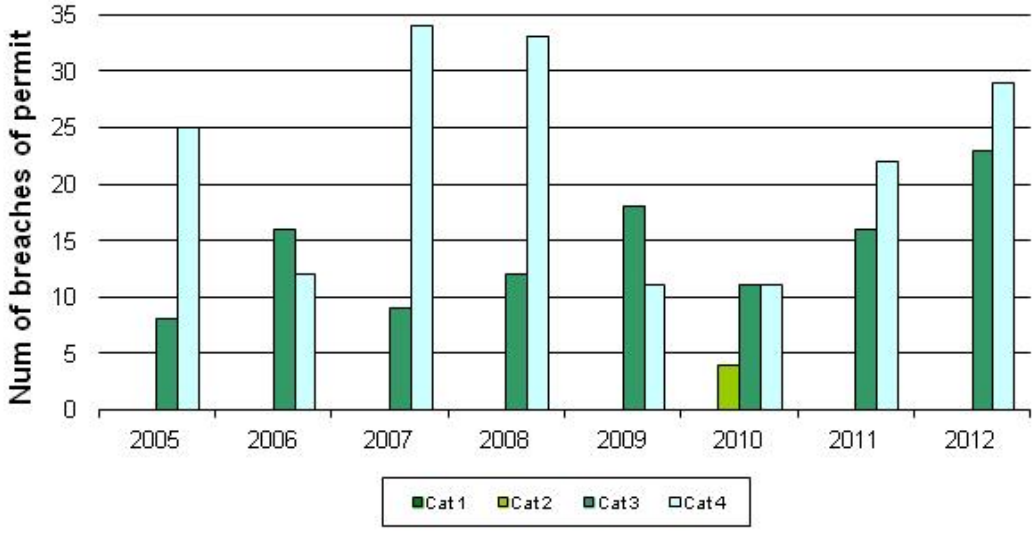
Number of pollution incidents



Note: The Environment Agency classifies incidents (in the CICS scheme) from Category 1 to Category 4, where Category 1 is the most serious. Incidents are classified based on their actual or potential impact. For example, a Category 1 incident has a major impact on the environment, while a Category 4 incident has no environmental impact. No incidents were recorded in 2005.

The number of Category 4 incidents (which have no environmental impact) decreased in 2012 compared to 2011. These types of incidents may include a minor deviation from the authorised activity, or a discharge being made from an incorrect discharge point. The number of Category 3 incidents increased from 8 in 2011 to 14 in 2012. Category 3 incidents have the potential to cause a minor environmental impact requiring no, or very limited, intervention, for example a discharge within the limits of the authorisation but from an unauthorised route.

Number of breaches of permit



Note: The Environment Agency classifies breaches (in the CCS scheme) from Category 1 to Category 4, where Category 1 is the most serious. Breaches are classified on their potential impact. For example, a Category 1 breach of permit has or could have a major impact on the environment. A Category 4 breach has no potential to have an effect on the environment.

The Environment Agency also monitors breaches of permit conditions using a 1 – 4 scale (the Compliance Classification Scheme (CCS)), with Category 1 being the most serious. There were no Category 1 or 2 breaches in 2012. The number of Category 3 and 4 breaches increased in 2012. Category 3 breaches are activities that could cause minor harm or pollution of the environment such as failure of monitoring equipment. Category 4 breaches are those that have no environmental impact (or no potential for environmental impact), such as a minor failure in record keeping, or other administrative transgressions.

In this year's report we are showing four confirmed Category 2 breaches for 2010. These four breaches relate to the misconsignment of radioactive waste from Sellafield to the Lillyhall landfill site described earlier in this section. The four breaches were assigned Category 2 CCS scores (potential for, or significant impact) on the basis that the loss of control of radioactive waste was a significant breach of Sellafield Ltd's environmental permit. The breaches occurred in 2010, but were not reported in the 2010 or 2011 Nuclear Sector Plan Environmental Performance Reports as they were not classified until 2013, following outcome of the prosecution case.

In 2010 the Environment Agency changed its internal guidance on scoring of non-compliances with environmental permits for radioactive substances activities. This internal guidance advises that officers should assign CCS scores to both breaches of permit and the root cause(s) of the breach. For example, if an operator failed to take a sample required by a permit, as a result of a member of staff being inadequately trained, then CCS scores will be assigned to both the failure to take the sample and also to the operator's failure to have an adequate management system to ensure training is carried out. This in part, appears to be the reason for the increases in numbers of CCS scores since 2010. For example, in 2011, there were 23 events which led to 38 breaches of compliance and in 2012 there were 28 events which led to 52 breaches of compliance.

Comparison with other industries

The nuclear industry had fewer serious pollution incidents or serious breaches of permits than most other regulated industry sectors in 2012.

Sector	Number of serious pollution incidents in 2012[a]	Number of serious breaches of permit in 2012[a]	Number of permits 2012
Nuclear	0	0	38
Water	69	143	35,500
Chemicals	4	21	524
Energy	4	0	414
Waste[b]	171	854	11841
Metals	3	12	203
Mineral products[c]	3	1	55
Farming	96	5	1150
Food and drink	4	4	376
Other[d]	23	1	124

(a) 'Serious' pollution incidents are those classified as Category 1 or Category 2 in the Environment Agency's Common Incident Classification Scheme (CICS). 'Serious' breaches of permits are those classified as Category 1 or Category 2 in the Environment Agency's Compliance Classification Scheme (CCS).
(b) Waste management include operations with waste management licences and installations with PPC permits
(c) The 'mineral products' sector includes cement and lime industries, glass ceramic and brick manufacturers, but not mineral extraction.
(d) The 'other' sector includes construction, textiles, and retail/wholesale.

Achieve better regulation

The Environment Agency has made good progress against each of its improvement goals:

- The Environment Agency has Site Environment Reviews (SERs) for all nuclear sites to provide transparency on how it regulates. These provide an overview of the environmental issues at each site. They cover both radioactive and non-radioactive issues, summarise short and medium-term objectives for the site and provide regulatory plans for the coming financial year. The SERs now also include a review of the previous year's regulation, in terms of charging and work conducted by the site nuclear regulator(s). The key purpose of these documents is to collate evidence and information to support the Environment Agency's strategic objectives and to help it carry out and demonstrate risk-based regulation.

- During 2012 the Environment Agency worked towards implementing its Medium Term Action Plan (MTAP) which sets out its priorities for risk-based regulation of radioactive substances in the nuclear industry. In 2012, progress against the MTAP included:

    - publishing new guidance on the criteria for setting limits on the discharge of radioactive waste from nuclear sites;

    - jointly[9] publishing new guidance on the principles for assessing radiation doses to the public arising from permitted discharges of radioactive waste to the environment;

    - conducting a series of themed audits at nuclear sites on management of 'out of scope' wastes and liquid effluent;

    - starting a programme of reviews on operator environmental monitoring programmes to ensure they are 'fit for purpose' and proportionate to the discharges from the sites.

- In 2012 the Environment Agency published its MCERTS standard for radioanalysis of waters, which has been made a requirement for all new nuclear power stations. For existing sites, it has proposed that if the site adopts the MCERTS scheme it will reduce the independent monitoring of waste water discharges. No operators have yet adopted the standard and therefore the Environment Agency continues to check waste waters using its contractor. This contractor plans to adopt the MCERTS scheme for radioanalysis of waters by the end of 2013. Another contractor which carries out the monitoring associated with the RIFE programme plans to adopt the MCERTS standard where appropriate.

- The Environment Agency aims to provide feedback to operators on incidents and breaches within two months of being notified of an event. Events are subject to detailed investigation by both the operators themselves and the Environment Agency as regulator. These investigations commonly take longer than the two month deadline. In over 90% of cases last year we provided written or verbal feedback to sites within the two month period, or agreed with the site that the feedback would take longer than two months due to continuing investigations. This is an increase on the 70% reported for 2011. The

[9] With the Scottish Environment Protection Agency, Northern Ireland Environment Agency, Health Protection Agency (now Public Health England) and the Food Standards Agency.

Environment Agency focuses its efforts on ensuring incidents are investigated fully and that any appropriate improvements are put in place to avoid a recurrence.

New landfill route from RSRL Harwell to Augean

The Environment Agency has introduced a new permit template at nuclear sites which facilitates increased flexibility in transfer routes as part of the Environmental Permitting Regulations. Sites such as RSRL Harwell have taken advantage of these changes in 2012 to use landfill routes for appropriate wastes. The Environment Agency has checked the waste at Harwell and at the receiving site, with reassurance monitoring around the landfill. The Environment Agency has also overseen in 2012 the introduction of new 'out of scope' values together with inspections of each site's arrangements. These two changes show how better regulation is helping to protect capacity at the national Low Level Waste Repository while maintaining environment protection.

Conclusions

Overall, the nuclear industry's environmental performance in 2012 has been good. The industry has continued to perform and progress well against most of the Sector Plan objectives, while at the same time maintaining good relationships and sharing best practice.

In 2012, as in previous years, the industry continued to maintain a high standard of regulatory compliance, but is committed to achieving further improvements in environmental performance that go beyond just compliance. The Environment Agency, by working with the nuclear industry, remains committed to supporting the industry in achieving these high levels of performance.

Total discharges to air and water decreased in 2012; this reflects the processes being carried out on sites. There was a decrease in fuel reprocessing in comparison to 2011, and annual fluctuations due to the range of operational, decommissioning and hazard-reduction activities being carried out throughout the industry.

In 2012 the nuclear industry avoided sending 87% of its low level waste to the LLWR by recycling or using other disposal routes. This compares to 84% in 2011. This is a significant achievement, which is helping to ensure that the limited capacity of the national repository is being protected for waste that *does* require the protection it offers.

We identified one particular aspect of environmental performance that needs to be improved. The nuclear industry, the Environment Agency and the other regulators will work to address the amount of Intermediate Level Waste conditioned and packaged. This metric is carried forward into Issue 3 of the Nuclear Sector Plan.

This concludes yearly reporting against Issue 2 of the Nuclear Sector Plan. Next year we look forward to reporting against Issue 3 of the Plan and in particular seeing how we have met the new challenges it sets.

Glossary

Geological Disposal Facility
Engineered repository located deep underground to hold higher activity waste, namely spent nuclear fuel. The repository is designed to isolate and contain wastes for long term periods.

Integrated Waste Strategy
An Integrated Waste Strategy is a strategy which describes:

- how a site optimises its approach to waste management in an integrated way
- the waste streams and discharges expected from current and future operations
- actions required to improve the site's approach to waste management.

The waste includes all radioactive and non-radioactive wastes (including those in solid, liquid or gaseous form) arising from the site's past, present and future operations, and any other waste transferred from other sites for management or disposal.

Land quality management plans
Plans for the control, monitoring and remediation of radioactive and non-radioactive contamination in the ground, or groundwater, at a site.

Letter of Compliance
Documentation provided by NDA to an operator (or anyone producing conditioned waste packages) indicating how suitable a proposed waste package would be for disposal to the Geological Disposal Facility. This information can be used by operators to demonstrate to the regulators that the proposed packages should be disposable.

Low Level Waste Repository
The UK's national low-level radioactive waste facility, located close to the west Cumbrian coastline in the north-west of England.

Monitoring Certification Scheme (MCERTS)
MCERTS is a scheme established by the Environment Agency. It provides a framework that businesses can use to demonstrate that their emission monitoring arrangements meet the quality requirements of their permits. A range of schemes exist, including for air monitoring, soil analysis, water monitoring and for environmental data management software.

Radioactive waste inventory
The radioactive waste inventory is a public record of information on radioactive waste present in the UK. It describes the sources, quantities and properties of radioactive waste that exist at a particular point in time. The latest available inventory relates to waste which existed at 1 April 2010 and waste forecast to arise in the future.

Waste hierarchy
The waste hierarchy is a useful framework which sets out the order in which options for waste management should be considered, based on environmental impact. The framework is based on trying to avoid the creation of waste in the first instance or, if this is not possible, then working down the hierarchy to try to minimise, re-use/recycle as much of the waste as possible. The last resort is to dispose of the waste to landfill.

Links to participating organisations

http://www.awe.co.uk

http://www.babcock.co.uk

http://www.baesystems.com

http://www.edfenergy.com

http://www3.gehealthcare.co.uk/

http://www.llwrsite.com/

http://www.magnoxsites.co.uk/

http://www.nda.gov.uk

http://www.research-sites.com

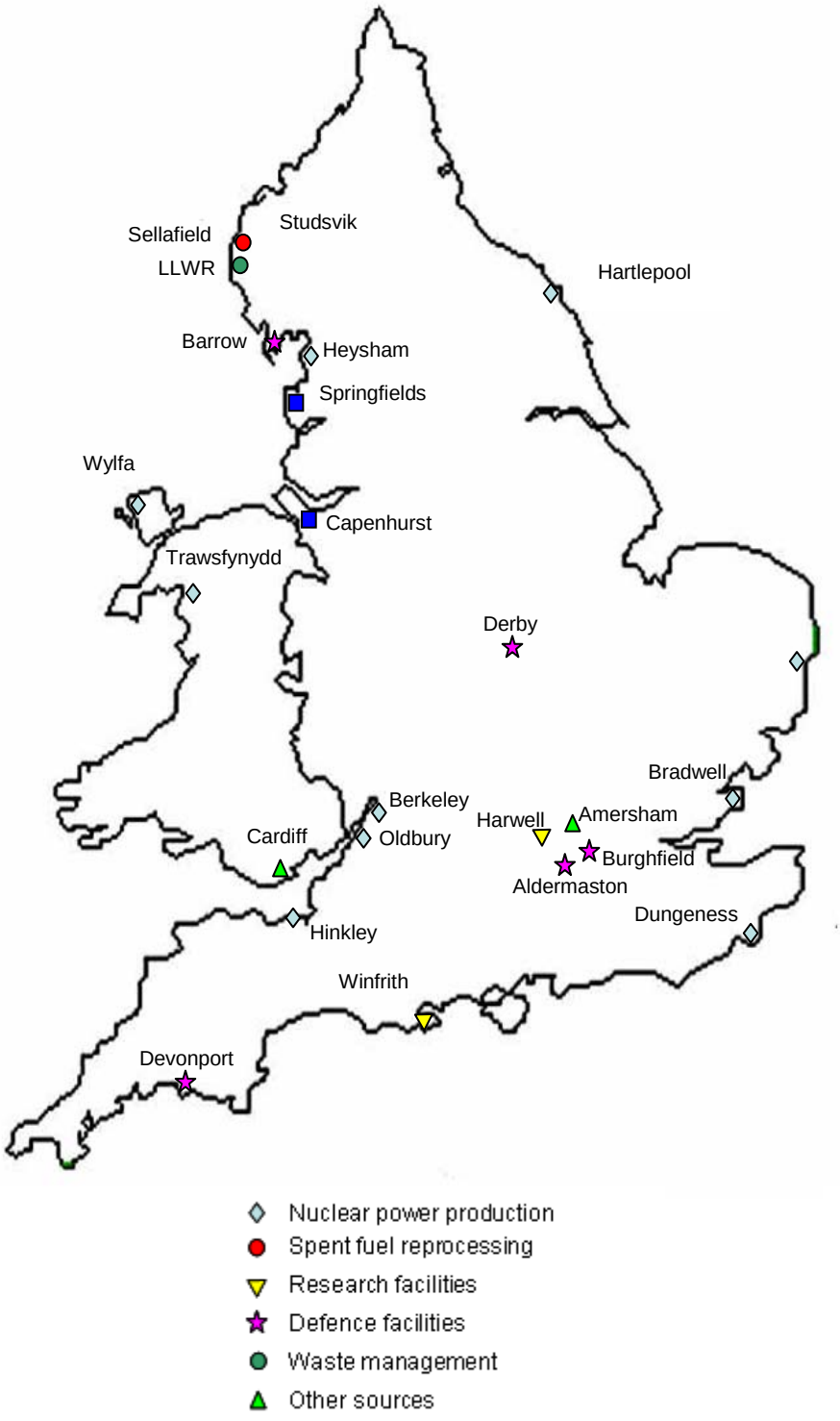
http://www.rolls-royce.com

http://www.sellafieldsites.com

http://www.studsvik.com

http://www.urenco.com

http://www.springfieldsfuels.com



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