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1.0 Facilitative Actions

The Government says it wants new reactors to go-ahead, so it is carrying out a series of 'facilitative actions' to speed up construction. [New Nuclear Monitor No.14](#) summarises these facilitative actions.

1.1 Strategic Siting Assessment (SSA)

The SSA is the process for identifying and assessing potentially suitable sites. A consultation on this closed in November 2008. The [NFLA submission](#) described the process as appearing to simply legitimise nuclear siting decisions already taken.

The Government [responded](#) to the consultation in January 2009, and called for nominations for potential sites from the industry by the end of March 2009. A draft [list of 11 nominated sites](#) was published on 15th April 2009 and the public was given just one month to comment. [New Nuclear Monitor No.16](#) suggested how to respond. The final list of nominated sites will be issued in Autumn 2009 as part of a consultation on the National Policy Statement on nuclear power (Nuclear NPS). Then the finalised Nuclear NPS will be published at the beginning of 2010, before a presumed Easter 2010 General Election. Under the new Planning Act the Nuclear NPS will establish the 'need' for new reactors, so the subsequent planning process will only deal with site specific issues. Further information available [here](#).

October Update: EDF Energy plans to build 6.4 gigawatts, at Hinkley and Sizewell (4 x 1.6GW) and the Eon and RWE consortium plans 6GW at Oldbury and Wylfa. This will be enough to meet 25% of electricity demand and exceed existing nuclear capacity of 11GW.

The NDA [launched](#) a process to auction land adjacent to Sellafield in June 2009. Iberdrola, which is part of a [nuclear consortium](#) (with Scottish and Southern Energy and French company GDF Suez) was [confirmed](#) to be amongst those companies who had expressed an interest in the 250-hectare site. Swedish power company Vattenfall, which had been talked about as a possible partner with Iberdrola, says it has [put its participation](#) in nuclear new-build on hold for up to 18 months to focus on renewable energy, nevertheless it was tipped, along with RWE, to have expressed an interest too.

RWE has [gone ahead](#) with its plans to buy the farmland earmarked for building nuclear reactors at Braystones and Kirksanton in Cumbria. [According to](#) local MP, Jamie Reid's researcher, the Kirksanton site is a fallback option to be used only if the Sellafield, 20 miles up the coast, proves impossible to build on. Residents of Braystones have launched a [website](#) which promises to "*show the pro-nuclear propaganda to be the pack of lies and half-truths*".

Contractors for Eon attempted to start drilling preparatory bore holes on 3rd August 2009 at Oldbury, but [villagers living nearby staged a five-hour protest](#) to prevent access.

Investigation work and surveys to support a planning application for Hinkley Point C are [expected](#) to start in September. It will involve digging trenches to carry out archaeological and soil investigations to identify locations for essential parts of the facility. [Offshore survey](#)

[works](#) in the Severn Estuary will be carried out to find the best location for water cooling intake and outlet tunnels. EDF consultants are also working on plans to refurbish Combrich Wharf, to allow large equipment for the new build to be delivered by sea.

1.2 Planning & National Policy Statement

The [Planning Act](#) creates a new Infrastructure Planning Commission (IPC) which will decide on projects of national significance for England and Wales. The IPC will act according to the National Policy Statements, such as the Nuclear NPS. But public inquiries run by the IPC will mostly be conducted in writing, and there will be no public right for objectors to cross examine developers. There are concerns this is a "developer's charter" which is deeply undemocratic. The IPC will formally be established from October 2009 with an interim body being set up ahead of that. The Department for Communities and Local Government (CLG) [Route Map](#) for establishing the IPC points out that "...over the next two decades we will need to replace around a third of our electricity generating capacity. Unless we do this in a timely and efficient manner, we risk not having sufficient capacity to meet projected energy demands".

October Update: Sir Michael Pitt, chair of the IPC, [says](#): "*There is undoubtedly a sense of urgency about energy. There's a feeling we've become over-reliant on imports, and there's a real imperative around climate change and carbon emissions. All of that is changing the shape of energy generation. Added to that, there's a need for a significant degree of modernisation of the national grid.*"

Three commissioners and two Deputy Chairs have been [appointed](#) to the IPC, but the quango may be relatively short-lived as the Conservatives will abolish it. They will however retain the National Policy Statements. Specialist planners recruited by the IPC will be transferred to a big projects team at the Planning Inspectorate and the Secretary of State would have his role as decision-maker restored.

A deal between local councils in Somerset and EDF represents a conflict of interest according to anti-nuclear groups. Somerset County Council, Sedgemoor District Council and West Somerset Council [announced they are considering](#) asking EDF Energy to fund the planning process for two new reactors at Hinkley under a Planning Performance Agreement. The councils say the move is necessary because the planning application will be so complex and will require experts in so many fields, and because repeated requests for Government funding have failed. Jim Duffy, co-ordinator for Stop Hinkley says: "*There is a clear conflict of interest in this deal with such a large, powerful developer.*" The [three Somerset councils](#) will advise the IPC, which will make the final decision on any planning application.

All the Draft National Policy Statements on Energy are expected to be published at the same time at the end of October or early November. It will be such an enormous document, the Government thinks the consultation period will have to be longer than three months. In parallel with the consultation there will be a parliamentary process with the drafts being examined by a special select committee. Consequently the Government has virtually abandoned the idea that the Nuclear NPS could be 'designated' before the General Election. The consultation and the possibility of appearing before the select committee will be the last chance communities have to challenge the principal of a new reactors at the nominated sites.

1.3 Generic Design Assessment

The nuclear regulators – the Health and Safety Executive (HSE) and Environment Agency – have been carrying out a new process called 'Generic Design Assessment' (GDA), which looks at the safety, security and environmental implications of new reactor designs before

an application is made to build that design at a particular site. The GDA should be completed around spring 2011, when the regulators would issue statements about the acceptability of the designs. But progress has been [slow](#), partly due to [staff shortages](#), and partly due to “[significant delays](#)” in obtaining responses to technical queries from the so-called Requesting Parties (RPs). Further information on the GDA process is available [here](#). UK Nuclear Regulators Nuclear Reactor Assessment [web-pages](#).

October Update: A string of issues is delaying the GDA. An overdue risk assessment of a 9/11-style terrorist attack on a British nuclear power plant, is still awaiting vital information from both French and US security services relating to terrorist attacks using aircraft. Bad-tempered meetings between HSE staff and nuclear industry executives are also blamed for slow progress according to [The Daily Telegraph](#). The joint regulators say in their [quarterly progress report](#): “*although we have seen improvements in the timeliness, and quality of [Requesting Party] RP responses to [Technical Questions] TQs, in some areas their responses have not allowed the issue to be resolved to our satisfaction*”.

Concerns over the EPR’s control and instrumentation systems - first [raised by the Finnish regulator STUK](#) – have also been [raised by HSE](#), because the EPR design breaks an important UK principle of maintaining a separation between control systems and safety systems.

The NII wants to collaborate with China on assessing new reactor designs, hire French inspectors on secondment and make greater use of third-party contractors. It is trying to [recruit project managers](#) from the very companies hoping to build new reactors including Bechtel, CH2M Hill, and Amec. It is also understood the inspectorate has recruited technical staff from Areva, which has submitted its EPR reactor designs for approval. Engineering consultancies Frazer-Nash and Praxis have been contracted to provide independent advice but [Frazer-Nash](#) is currently looking for a team leader for its nuclear business unit, a nuclear physicist and a nuclear consultant. Not much point in taking on consultants to ease staff shortages if those consultants are then competing to recruit nuclear safety specialists.

Nuclear companies are becoming increasingly nervous about the inspectorate’s ability to handle the work and fear delays in the GDA could delay construction of new reactors. NII wants to [streamline the assessment](#) by waiving certain aspects through a series of “exclusions” and “conditions” that can be revisited later. Greenpeace [rejected](#) this course of action saying it risks emasculating essential stages in the regulatory process.

1.3.1 Shortage of Nuclear Inspectors – The Stone Review

The HSE is attempting to recruit 50 new nuclear inspectors, but too few people have been applying. Staff shortages at the Nuclear Installations Inspectorate (NII) could lead to delays in the licensing of new reactors. In January 2008 the Government asked Dr Tim Stone to conduct a review of nuclear regulation. His findings have been reported, but the Government has only published the [Summary Recommendations](#) and its [response to the review](#). The full advice has not been made public. Stone recommended that the NII be given financial and organisational flexibility.

October Update: The Government is [planning](#) to create a new nuclear statutory corporation by combining responsibility for overseeing safety, security and transport of civil nuclear sites and material. Under the proposals the Health and Safety Executive’s (HSE) Nuclear Directorate will be extended to take responsibility for the Department for Transport’s (DfT) Transport Security and Contingencies Directorate and Radioactive Materials Transport Team, and [formally take over](#) the operation of the Office for Civil Nuclear Security and the UK Safeguards Office. A joint DECC and Department for Work and Pensions [consultation](#) is

open until 22nd September. [World Nuclear News](#) describes this as the latest move “to facilitate the building of nuclear power plants.”

[Greenpeace lambasted](#) the proposed changes to nuclear regulation - supposedly to make decision-making more open and transparent – because they are based on a review, whose aims were never consulted on, and a report which has been kept secret. This undermines the purpose of the exercise and understandably leads to public scepticism. It said the proposals do not provide the necessary distance between those Government departments promoting nuclear power and the regulator, and there is absolutely no explanation of how greater transparency - to the public or Parliament - would be ensured by the restructuring. There will be no review of how the Nuclear Directorate operates its licensing processes for nuclear facilities which are effectively closed to public input and Parliamentary oversight.

1.4 The Justification Process

A [Justification exercise](#) is required under EU law to ensure that nuclear power developments have an overall benefit which outweighs any health detriment caused by the use of ionising radiation. The Government held a [consultation](#) on the Nuclear Industry Association’s application to justify new nuclear power stations which closed on 25th March 2009. A draft Government response is expected in the autumn, with another consultation period before a final decision is made early next year. [New Nuclear Monitor No.15](#) was produced to encourage responses to the Government’s Justification Consultation.

NFLA is unequivocal – the opportunity costs of new reactors are too high. Nuclear investment will damage the nascent local energy revolution which local authorities should be at the centre of, and thus damage efforts to tackle climate change. Nuclear power’s capital costs are out of control and recent studies have cast "significant doubt" over the official risk attached to radiation doses received by people living near nuclear reactors.

October Update: Under the regulations governing Justification: *The Justification of Practices Involving Ionising Radiation Regulations 2004 (No. 1769), Regulation 17*, the Secretary of State for Energy and Climate Change has the power to call an inquiry into a justification application. And, under Regulation 18(2), he is obliged consult the Devolved Administrations.

The [Nuclear Consultation Group](#) (NGC) has already [written](#) to the Department for Energy and Climate Change (DECC) calling for an inquiry. Now the Welsh Environment Minister Jane Davidson has [joined calls for a public inquiry](#). She wrote to Lord Hunt of Kings Heath in June expressing her support for a call for a public inquiry into the request for justification for proposed new nuclear reactors on the grounds of concern over the safety and security of the management of future nuclear wastes.

In answer to a question from Patrick Harvie MSP at the end of September, the Scottish Energy Minister, Jim Mather, said while the Scottish Government’s position on nuclear power is clear, it has not joined calls for a public inquiry on justification. He says it is not Scottish Government policy to intervene in “planning matters” (sic) in England and Wales.

Writing in [Environmental Health Journal](#), Dr Ian Fairlie suggests the recent German KiKK study shows radiations doses from environmental emissions from nuclear reactors to embryos and fetuses in pregnant women near nuclear power stations may be larger than suspected. Fairlie says the study raises many questions, including whether vulnerable people, such as pregnant women and women of child-bearing age, should be advised to move away from the immediate vicinity of nuclear power stations. The Department of Health has asked the [Committee on Medical Aspects of Radiation in the Environment](#) (COMARE) to conduct a

review of recent publications on the incidence of childhood leukaemia in the vicinity of nuclear power stations. COMARE has set up a subgroup of committee members and external experts to conduct a review.

The draft Government decision on Justification is expected to go out for consultation in the next couple of weeks.

1.5 Paying for waste and decommissioning

The Government says utilities will be expected to meet “*the full costs of decommissioning and their full share of waste management costs*”. But the system proposed is one in which utilities pay a fixed-price into a fund in return for the Government taking the waste, and absorbing all the risks. There is huge scepticism about this method of funding of waste and decommissioning costs. It offers opportunities for the Government to hide any subsidies with a risk the public will end up footing the bill. So this issue is crucial to the economics of new reactors. If utilities are forced to pay a fully commercial price it will be far too expensive, and kill the prospect of any new reactors.

Government website on [Funding Waste and Decommissioning Costs](#).

The Office for Nuclear Development has published three pre-consultation discussion papers on the development of estimates of the costs of decommissioning and waste management. A longer briefing, including a summary of the first two discussion papers, is available [here](#). The [third pre-consultation discussion paper](#) was published in May 2009. A formal consultation – this will take place later in 2009.

Lady Balfour of Burleigh has been appointed as Chairman of the independent [Nuclear Liabilities Financing Assurance Board](#) (NLFAB), along with six board members, including former Greenpeace International lobbyist Simon Carroll. NLFAB was established to provide independent scrutiny and advice on the suitability of the funded decommissioning programme (FDP) submitted by operators of new nuclear power stations as well as regular review and ongoing scrutiny of funding arrangements.

October Update: The UK Government has indicated the ‘fair share’ for waste ‘disposal’ will be calculated as the proportion of space nuclear operators’ radioactive waste takes up in any repository. Nuclear Economist [Ian Jackson calculated last year](#) that foreign utilities with Sellafield reprocessing contracts are paying about £201,000/m³ for the ‘disposal’ of intermediate-level waste. It would be hard to justify charging British utilities a lower price and would risk accusations of illegal state aid. The problem is that if UK utilities are forced to pay the full commercial price it would cost around £820 million per reactor - 41% of each reactor’s expected £2 billion capital cost - far too expensive, killing the prospects of any new reactors. [In other words](#), new reactors will not be built unless the government fixes the market.

In a [recent talk at Sellafield](#) Jackson detailed how the Government intends to set the fixed unit price for spent fuel disposal in 2010 – at least 30 years before a deep repository could possibly be opened. He says the commercial price for nuclear waste disposal for each new reactor would be around £1bn to £1.4bn. But this would not be payable for 100 years. The utility would make fixed pay-as-you-go payments into a pension-type fund. Assuming a 1% rate of return the utility would pay £16m per year over the reactors 40 year life, but after 100 years this would have accrued £795m in interest. This means only around 3 – 4% is added to the cost of electricity. So the availability of the required funds in 100 years time will depend on the performance of the stock market over the next century – which is almost totally unpredictable. Up to 83% of the cash required is expected to come from interest payments.

Martin O'Neill, Chairman on the Nuclear Industry Association, [says the figure proposed by the Government for the fixed price](#) is considerably higher than the industry figure. *"There is a gulf between what companies guess new build waste treatment will cost and the government estimate – a rather large gulf. There is a question over the methodology over how the government sum is arrived at," he said.*

2.0 Nuclear Costs and Finance

The Blair Government's first Energy White Paper in February 2003 concluded that "...the current economics of nuclear power make it an unattractive option for new generating capacity". By January 2008, the White Paper on nuclear power said "...on the basis of our cost-benefit analysis, we believe that nuclear power is likely to be an attractive economic proposition..." What has changed?

An [October 2008 briefing](#) on nuclear costs and finances discusses this.

In the US, nuclear costs are out of control as reported in this [February 2009 update](#) on costs and finances.

October Update: In the few short years since the so-called 'Nuclear Renaissance' began there has been a four-fold increase in projected costs, according to [Dr. Mark Cooper](#), a senior fellow for economic analysis at the Institute for Energy and the Environment at Vermont Law School.

[Cooper has analysed](#) three dozen recent cost projections, and concludes the likely cost of electricity from new reactors would be 12-20 cents per kilowatt hour (c/kWh) (7-12p/kWh at June 2009 exchange rates) - considerably more expensive than the average cost of energy efficiency and renewable energies.

US utilities and Wall Street agree on one thing - [nuclear reactors will not be built without massive subsidies](#). The attitude of the Baltimore-based utility – UniStar – a joint venture between EDF and Constellation Energy, is typical. UniStar is planning four new plants (8 reactors) at a cost of up to \$48bn – roughly the same as the U.S. spent on the Iraq War in 2006. The U.S. Treasury is expected to guarantee 80% of the total costs through a loan guarantee program. To cover the remainder, UniStar plans to seek loans from the French import/export bank COFACE. Under no circumstances does Constellation or EDF intend to dip into their own coffers to fund the project. UniStar CEO, George Vanderheyden, says "without the federal loan guarantees, this whole thing will come to a stop."

Dr Mark Cooper says [three developments](#), since his report was published in June, have provided new evidence to support his concerns about the cost of nuclear power. US utility, Exelon, has cited "economic woes" as a major factor in postponing plans to build two reactors in Texas; The Ontario Government has announced the suspension of bidding for two replacement reactors citing excessive costs and uncertainties involving the ownership status of the sole Canadian bidder; and Moody's Investor Services said it is considering "taking a more negative view for those issuers seeking to build new nuclear power plants".

2.1 France and Finland

The French designed EPR is the flagship of the so-called "nuclear renaissance". But construction of the EPR has only started in Finland and France, and both experiences have been disastrous. Widespread doubts about the ability of nuclear power companies to build new reactors on time and budget have been raised by problems with reactors being built in France and Finland. Further information available [here](#)

October Update: The [dispute](#) over the enormous financial losses of the Finnish reactor project has deepened. Areva published its half-year results and threatened to freeze construction if Finnish utility, TVO, does not agree to share some of the cost. The latest estimate of construction costs reached €5.5 billion, which compares to the price of €2.5 billion originally presented to Finnish public and politicians.

If TVO has to foot a part of the extra bill for Olkiluoto, it can pass the entire cost on to its shareholders, more than half of which are Finnish publicly owned companies. If the company manages to leave all of the costs with Areva-Siemens, they will ultimately be paid for by French and German taxpayers.

2.2 Nuclear Subsidies?

The Government has pledged not to subsidise new nuclear plants, but industry sources say talks have begun on how to devise “a subsidy by another name” that would allow the government to stand by its promise of no direct taxpayer support.

October Update: According to both [The Times](#) and [The Telegraph](#) energy companies have told the Government their pledge not to seek public aid to fund new reactors is no longer realistic. There is a consensus in the industry that without help new reactors will not be built. One option being discussed is to set a “floor price” for carbon, another is a levy on household fuel bills.

Setting a “floor price” for carbon permits that coal and gas generators have to buy to cover their emissions is an idea supported by EDF. The [company has threatened](#) to scale down its nuclear plans if this doesn’t happen. EDF’s business case to build four new reactors depends on a carbon tax or minimum carbon price being introduced. Two years ago carbon prices fell to as little as €0.10 (£0.08) a tonne. Experts say that a far higher price - at least €50-60 a tonne - is necessary to make nuclear power generation economic. The European Trading Scheme price is currently around €13. DECC insists there is no plan for a carbon “floor price”, saying carbon prices will rise when the supply of permits is restricted next year.

The Government's [Committee on Climate Change](#), headed by Lord Turner, the Financial Services Authority (FSA) chairman, also says there should be a "floor price" on carbon emission permits.

Another option is for consumers to pay a levy on their energy bills, similar to the “renewables obligation”. Ministers are currently preparing a new Energy Bill to create another “obligation” on bills, to pay for new “clean coal” technology. Sources in the energy industry confirmed there had been talks about lobbying for a nuclear levy to be added to the Bill.

Clearly most options for supporting low carbon and nuclear energy will hit consumers in their pockets, but John Large, an independent consultant on nuclear energy, estimates that supporting new nuclear power stations would cost households “significantly more” than the £15 charged to subsidise renewables.

Taxpayers could also be [forced to provide commercial insurance](#). Private insurers are refusing to offer full coverage against the risk of a Chernobyl-style accident. The situation has arisen because rules contained in an international agreement signed by the UK in 2004 will force nuclear operators to broaden the type of insurance they have in place. Insurance will need to cover claims for loss of life, personal injury and damage to or loss of property for up to 30 years from the date of an incident, rather than the current 10, and the amount of cover must increase to £620m from the current £140m per site.

3.0 Nuclear Safety

If there is a burst of new reactor building around the world, the reactors built are likely to be so-called “Advanced Reactors,” or Generation III. What is most worrying about these reactors is that many of the new designs use so-called ‘passive’ safety systems which rely on a completely different safety philosophy. Some experts question whether this makes the reactors safer. Reliance on passive safety systems could result in an uncontrollable situation during an accident with the plant workers left with no means to do anything about it.

New reactors start with a higher risk as they are broken in, and then the risk reduces, but increases again towards the end of a reactor’s life as age-related failures begin to occur. Most of the world’s reactors are more than 20 years old and therefore more prone to accidents. A briefing on nuclear reactor safety is available [here](#).

The Nuclear Safety Advisory Committee (NuSAC) has been [quietly scrapped](#) after it warned the future safety of Britain's ageing nuclear plants was being put at risk by poor performance, delays and budget cuts. Former members of NuSAC are now worried about the lack of independent safety advice at a time when the government is embarking on a major expansion and clean-up of nuclear power.

October Update: Britain’s ageing nuclear power and weapons plants have been [plagued by more than 1,700 leaks](#), breakdowns and other mishaps over the past seven years, according to a secret report by the government’s chief nuclear inspector, Mike Weightman. The report, released under freedom of information legislation, reveals the catalogue of incidents and accidents that have confronted the UK safety watchdog, the Nuclear Installations Inspectorate (NII), as it struggles to cope with a growing workload and a severely depleted staff.

The list includes a serious nuclear accident at Sizewell A in 2007 when 10,000 gallons of radioactively contaminated water leaked from a pipe carrying cooling water to a spent fuel storage “pond”. [Suffolk only narrowly avoided disaster](#) because the leak was spotted by chance when an employee decided to do some washing. If the leak had not been detected it could have led to the whole spent fuel pond draining, and the spent fuel catching fire causing an airborne release of radioactivity.

Thousands of litres of radioactive waste [leaked into the Firth of Clyde from the Hunterston](#). The station has been accused by the Scottish Environment Protection Agency (Sepa), of breaking six legal promises it made to prevent people and the environment from being contaminated by radioactivity. Sepa says it is “*deeply concerned*” about the leak. Sepa’s radioactive substances specialist, Keith Hammond, has written a stern “*final warning letter*” to Hunterston.

4.0 Reactor Construction

The Nuclear Industry Association - the umbrella organisation for the industry – is running a series of meetings around the country aimed at [kick-starting interest from companies](#) to participate in a new reactor building programme. About 70% of the construction work is expected to go to UK companies.

October Update: French reactor maker Areva [says the UK is clearly in the front](#) rank of all global new build markets, and Areva wants a major role. Areva and its supply chain “*need to demonstrate to UK utilities by the end of 2009 that we are ready.*” Over 20 companies have already been [qualified as suppliers](#) and “*by the end of the year we hope to have many more.*” Areva says it is planning to recruit thousands of new engineers and other staff to carry out its construction programme.

E.ON and RWE are key to new nuclear-build in the UK. However, a major change in the German energy landscape may cause their investment focus to become more domestically-orientated – [a reversal of Germany's nuclear phase-out policy would certainly not be helpful](#) for the prospects of new nuclear-build in the UK.

Companies will [be invited to tender this year](#) for the first of 150 contracts, worth “many billions of pounds”, to build new reactors for EDF Energy. EDF Energy presented details of the tender process and work packages at a seminar in London for companies hoping to join the supply chain. Setting out a timetable for the contracts, the company said two tenders will be published this year, for earthworks and a marine off-loading facility. In the first half of 2010 companies would be invited to tender for major packages including the main civil works contract, turbine generator, and cooling water pipework. [Amec has been appointed](#) to support EDF's architect/engineer division in project managing EDF's new reactor programme.

Six consortia, including Bilfinger Berger, Carillion and Laing O'Rourke, are [jostling](#) for the role of new nuclear delivery advisor to Westinghouse in the UK.

Government funding of around £10m will go to [Rolls Royce](#), working with [Areva](#), for the construction of a factory for manufacturing nuclear components. Rolls-Royce noted that the new component plant will have "strong links" with the [Nuclear Advanced Manufacturing Research Centre](#) (NAMRC), announced by the UK government in July, in which the company will be the leading industrial partner. The NAMRC is expected to open in 2011. [The Government has pledged around £15 million](#) to set up NAMRC. The centre will house 30 industrial partners as well as leading universities in the nuclear field. In addition, the Manufacturing Advisory Service (MAS) will receive £4 million to expand services to the nuclear sector.

5.0 Nuclear Diverting Attention from a Local Energy Revolution

A wide range of energy and carbon emissions scenarios for the UK and Scotland suggest that with the right combination of energy efficiency measures, renewable energy, transport measures, and possibly carbon capture from fossil-fuelled power stations, emissions reductions of over 80% by 2050 are feasible. Nuclear power is not a prerequisite of the UK meeting its climate change objectives. [Briefing on Alternatives to New Reactors in Scotland](#).

The danger of nuclear investment is that it will [crowd out investment in renewables](#) and undermine energy efficiency. If we divert attention political effort and resources from the urgent programmes needed to effectively tackle climate change not only will we miss our targets, but as past experience suggests we could end up with carbon emissions still rising in 2025 because the nuclear programme has been hit by the problems and delays we have seen in the past and by then it will be too late to start implementing alternative strategies.

October Update: The Government has outlined plans for a switch from fossil fuels to renewable energy and nuclear power. Its [Low Carbon Transition Plan](#) says 30% of UK electricity will be supplied by renewable sources and 10% by nuclear power and coal with carbon capture and storage by 2020. [E.ON called it a framework](#) to enable energy companies to build 12 new nuclear power stations, 4 new coal-fired power stations with carbon capture and 26GW of offshore wind. The framework has a distinct lack of ambition on microgeneration and fails to appreciate the role which could be played by local authorities.

Of the 30% of electricity expected to come from renewables, mostly wind, [only 2% will come from small-scale sources](#). 12% of heat demand and 10% of transport demand will also be

provided by renewables. The plan includes launching a feed-in tariff - the “clean energy cashback scheme”; a ‘Pay as you Save’ scheme and a Renewable Heat Incentive. But these plans for small-scale renewables will [release less than one-third of the industry’s potential](#) capacity. Research by the [Energy Saving Trust](#) shows that microgeneration could provide around 30-40% by 2050, so we ought to be expecting a much larger contribution in 2020. The European Photovoltaic Industry Association expects just one small-scale technology - solar [photovoltaics to provide 12% of all electricity by 2020](#) across Europe – compared with the 2% the UK expects all types of microgeneration to provide.

Now the [building industry is gearing](#) up to support a greater role for solar. Under the umbrella group ‘[We Support Solar](#)’, the Federation of Master Builders (FMB), National Federation of Roofing Contractors (NFRC), and Electrical Contractors’ Association (ECA) have brought together almost 16,000 building companies. The group wants the Government to increase the proposed Clean Energy Cashback rate by 10p per kWh. It says this would create nearly 30,000 jobs in the solar sector by 2014 and deliver more than six times the government’s target for solar electricity generation.

Local authorities called for an increased role in providing the energy efficiency strategy. The [Local Government Association](#) (LGA) for England and Wales said there are too many different schemes aimed at cutting household emissions. These should be merged into a single £7 billion fund to allow councils to embark on a more cost-effective programme. The plan says the Government will explore how to unlock greater action by local authorities in identifying the best potential for low carbon community scale solutions in their areas. The [NFLA said](#) “*We cannot afford to wait another six years while the Government ‘facilitates new nuclear reactors’ and tries to work out how to unlock greater action by local authorities.*”

The [Confederation of British Industry has thrown its weight behind](#) the nuclear industry’s calls for the government to scale back “overambitious” wind power targets in favour of new reactors. Eon and EDF recently told the government it must choose between new nuclear and major renewables developments. In what amounted to an admission that nuclear power is distracting attention from renewables, the [CBI said incentives](#) focused on ramping up wind power will draw investment away from other low-carbon energy sources such as nuclear and clean coal. Writing in [The Telegraph](#), Geoffrey Lean says when in trouble the nuclear industry has traditionally sought government support and tried to stifle rival technologies. That seems to be happening again.

A nuclear revival will not take place or will prove “irrelevant” [according to Jonathan Porritt](#), who is stepping down as Chairman of the Government’s Sustainable Development Commission (SDC). He says years have been wasted in pursuit of new reactors. Civil servants failed to get on and implement the 2003 Energy White Paper, which called for energy efficiency and renewables - instead they “*kept the nuclear flame burning*” until the Secretary of State changed. [Porritt says](#) “*Little more than a year ago, these nuclear zealots were telling the world that any new nuclear in the UK would require zero public subsidies. Hardened anti-nuclear campaigners ... fell about laughing ... Government said we were wrong, explicitly. Now, they are all in there asking for large amounts of public money.*”

6.0 Energy Security

[A report](#) commissioned by Gordon Brown, from former energy minister Malcolm Wicks, says the UK needs to more than double the amount of electricity generated by nuclear power, as well as boosting renewables, energy efficiency and gas storage to guarantee energy security. Wicks said the government should consider setting out how much power should be generated from different sources to avoid Britain becoming too reliant on relatively cheap gas-fired power plants.

Wicks says energy efficiency must be the start of any kind of response to the energy security problem, yet there is not a single mention of combined heat and power (CHP) in the 130 page report, nor any mention of micro-CHP. Pöyry Energy Consulting, in a [report](#) commissioned by Greenpeace, showed that industries across the UK could generate as much electricity as 10 nuclear power stations and halve gas imports by installing or extending combined heat and power (CHP) plants. [Micro combined heat and power](#) (micro-CHP) boilers could replace conventional domestic central heating boilers, and produce electricity as well as hot water for heating. By 2020, we could have the equivalent of ten new reactors powered by micro CHP.

Wicks notes that over 80% of electricity in France comes from nuclear power plants. *“This means that aside from uranium France is much less dependent on overseas markets for its security of supply than the UK will be in the future, less exposed to movements in fossil fuel prices”*. The problem is this is not true. [Per capita consumption of oil is higher than in non-nuclear Italy, nuclear phase-out Germany or the EU on average](#) and three million French are cold in winter, because electric space heating was heavily promoted and now equips three-quarters of new housing, in particular multi-family homes. Electric heat is not just inefficient but is also very costly for the user and creates daily peak loads in the winter which in turn leads to increasing use of old oil- and coal-fired power plants and to significant power imports.

7.0 Proliferation

Labour MP, Paul Flynn has described Gordon Brown’s latest call for a new global bargain for nuclear energy as *“deeply, seriously mad”*. Brown [wants to the world’s nuclear powers to negotiate](#) a multilateral reduction in the number of warheads, and to offer assistance to states keen on developing civil nuclear energy in return for assurances they too will not attempt to acquire a nuclear arsenal. [The Road to 2010 paper](#) sets out what it calls “an ambitious plan” which includes establishing “the right conditions for nuclear power to play its part in combating climate change, global poverty and energy shortages”. Among the specific measures announced was a new Nuclear Centre of Excellence to promote wider access to civil nuclear power across the world – “which cannot be diverted for use in weapons programmes”. This Centre, to be developed in partnership with industry and other countries, [will receive initial funding of £20million](#) from the Government.

8.0 Managing Radioactive Waste Safely Process

The Government began the ‘Managing Radioactive Waste Safely’ process in September 2001 to decide how to develop radioactive waste policy following the 1997 decision to reject plans for a so-called Rock Characterisation Facility at Sellafield. This culminated in the publication of a [White Paper: Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal](#), in June 2008. A briefing on the “Managing Radioactive Waste Safely” process is available [here](#).

[History of Radioactive Waste Dumping Proposals](#).

October Update: The UK government’s [strategy for dealing with deadly nuclear waste](#) is in jeopardy, according to the Committee on Radioactive Waste Management (CoRWM) because only two local councils in one region, west Cumbria, have shown any interest in hosting the £13.8bn underground facility. Thirteen councils who enquired decided not to go any further. That raises questions over the policy of “voluntarism” which was designed to prevent host communities feeling unfairly picked on. To sweeten the nuclear waste pill there was to be a package of incentives, but now there is a “lack of confidence” in the process in some communities, according to the CoRWM chairman, Professor Robert Pickard, and doubts have

emerged among some local people about whether future Governments will deliver on promises made today. The repository won't be ready before 2040 at the earliest and pessimists believe it could be much later than that.

Lord Hunt wrote again in October to the leaders of all county councils reminding them that volunteer communities for hosting a repository are still being sought.

8.1 Deep Geological 'Disposal'

The Committee on Radioactive Waste Management (CoRWM) describes 'disposal' as emplacing waste in a facility without the intention of retrieving it. The dictionary definition of disposal is "*the act or means of getting rid of something*". So-called radioactive waste 'disposal' involves the eventual dilution and dispersion of radionuclides throughout the environment, so this is a misnomer. It does not 'get rid' of waste. This goes to the heart of the fundamental difference between an environmental and nuclear industry approach. Supporters of deep 'disposal' argue it is this generation's responsibility to 'get rid' of waste we have created. An environmental approach argues we have a responsibility to give future generations a choice about how to deal with it, rather than leaving a radioactive waste dump which will contaminate the environment at a poorly predictable rate.

October Update: CoRWM has finalised its [report to Government](#) on Deep Geological Disposal of Higher Activity Wastes (HAW). The NDA is currently at the stage of developing a deep disposal concept. CoRWM wants the option assessments at the concept level to consider a wide range of options, and for a wide range of stakeholders to be involved in the options assessment.

The [NFLA response](#) to CoRWM's draft report, says the Government has pre-empted the process by seeking volunteer communities before it has been demonstrated that it might be possible to show the safety and public acceptability of deep geological disposal. The NFLA say CoRWM is right to encourage the Government to acknowledge uncertainties involved. On retrievability, NFLA say host community's confidence in the facility's ability to contain the waste is important, so if the community wants the facility to be retrievable, it should be.

The [Nuclear Industry Association](#) (NIA) says it has started interviewing utilities, scientists and consultants on the best way to deliver an underground nuclear waste facility, which is likely to be built near Sellafield in Cumbria. Mark Higson, chief executive of the government's Office for Nuclear Development, is said to be pressing for urgent progress on the facility in advance of a new reactor construction programme. NIA says it has not decided how it would use the research but industry sources said it would feed into official nuclear waste strategy, due out in the autumn.

8.2 Research and Development

The Environment Agency reviewed the research programme of the former UK Nirex Ltd, and identified more than 20 scientific, technical and engineering issues that need to be better understood in order to have confidence in containment of radioactive wastes over very long timescales. The NDA held a consultation on its [Proposed R&D Strategy](#), which closed in November 2008. This was designed to take a first step to address these issues. The NDA published its [Research and Development Strategy](#) to underpin Geological Disposal in March 2009. Clearly there is still a lot more work to do to understand the uncertainties involved.

October Update: Many of the issues you might expect would be dealt with in CoRWM's report on Deep Geological Disposal are in fact in its [draft report on Research and](#)

[Development \(R&D\)](#). For example the conflict between needing to let hydrogen gas escape from the repository to avoid explosions and the need to keep radioactive methane gas contained - an important issue which affects every aspect of the multi-barrier approach used in the deep geological disposal. In its [response](#) the NFLA call on CoRWM to accept the possibility that it may never be possible to have sufficient confidence in computer models of the risks involved in burying radioactive waste in a deep repository. It says CoRWM's comments on the storage of waste, particularly high-level liquid waste stored at Sellafield, lack the required sense of urgency. Nor does CoRWM highlight the problems associated with plans to bury spent fuel from proposed new reactors. NFLA calls on CoRWM to recommend that no justification decision is taken on building new reactors until research on the disposability of high burn-up fuel is carried out and subjected to a public inquiry.

Rather intriguingly CoRWM's consultation document says "*an option related to the long-term management of SF (spent fuel) that is rapidly gaining favour is dry storage ...*" - the alternative put forward by Friends of the Earth at the 1977 THORP inquiry - and "*Without demonstrating that geological disposal of AGR SF is feasible, AGR fuel strategies are incomplete*".

9.0 Low level waste

The UK's main low-level waste dump, operated by [The Low Level Waste Repository \(LLWR\) Ltd](#), is located 7km south east of Sellafield. The site is owned by the NDA. UK Nuclear Waste Management Ltd - a consortium led by Washington Group International with Studsvik UK, Serco and Areva - was awarded the Parent Body Organisation contract for the LLW Repository in March 2008. Vault 9 is currently being constructed at Drigg. Copeland Borough Council will receive millions of pounds in community benefit as a result. [The first £5 million has been paid](#) by the NDA into the Copeland Community Benefit Fund and another £5million will follow later in 2009. Thereafter [Copeland will receive £1.5 million for every year](#) the repository continues to receive the waste, probably up to 2070.

LLW Repository Ltd set up, in partnership with the NDA, the [National Low Level Waste Strategy Group](#) in April 2008. The Strategy Group provides information on the development and implementation of a National Low Level Waste (LLW) Strategy. SCCORS and NuLeaf are both [listed](#) as members of the Strategy Group. A presentation from April 2009 on the emerging strategy is available [here](#).

October Update: The NDA has been [consulting](#) on how to manage low-level radioactive waste (LLW). It sets out a framework for the flexible management of LLW, and argues that earlier policy did not cover large scale decommissioning and site restoration and that waste management options beyond engineered disposal will be critical. The framework allows for development of solutions on a case-by-case basis.

In its [submission](#), the NFLA argues the so-called flexible approach means increasing the amount of wastes going to landfill; pressure to lower standards for site remediation in an attempt to reduce the volumes of waste generated and their associated disposal costs; pressure to allow increases in discharges of liquid radioactive waste into the marine environment, as a consequence of the decontamination processes for metals earmarked for recycling. NFLA says any proposed strategy must be based on a clear set of [environmental principles](#); setting a boundary on the amount of waste to be dealt with – in other words cancelling proposals for new reactors; and extensive consultation in an open and transparent manner.

A number of sites are already considering opportunities to dispose of waste to facilities other than Low Level Waste Repository near Drigg. But [recent press reports](#) suggest that Cumbria County Council is expected to refuse permission for low level waste disposal at Lillyhall and

Keekle Head on the grounds that it does not want to see a proliferation of nuclear waste disposal sites. *“It should not be put in holes and imposed on people around West Cumbria.”* There are also [plans to increase](#) the amount of radioactive waste buried at Clifton Marsh near Blackpool.

10.0 Intermediate Level Waste

See Waste Storage Review.

11.0 Radioactive Discharges

The UK Government published a [Strategy for Radioactive Discharges 2001-2020](#) in July 2002, as a response to its commitments, agreed at the 1998 Ministerial meeting of the Oslo and Paris (OSPAR) Commission - the treaty for the protection of the marine environment of the North-east Atlantic - to achieve *“substantial reductions or elimination of discharges”* by the year 2020, *“to levels ...close to zero”*.

In June 2008 DEFRA (and the devolved administrations) launched a [consultation on a revised strategy for 2006 – 2030](#). The 2002 strategy was written in the context of a declining UK nuclear industry, but this new draft allows for expansion, and accepts the UK's failure to close some of the most polluting facilities in the world. The revised strategy will not deliver the UK's commitments to OSPAR. The NFLA (Scotland) response to this consultation (September 2008) is available [here](#).

The next [OSPAR](#) Ministerial Meeting will take place in Bergen 20th – 24th September 2010.

October Update: A rise in radioactive discharges into the atmosphere forced the Magnox reprocessing plant [to close in June](#) to avoid exceeding its discharge limit. Sellafield Ltd will have to apply to the Environment Agency for a new authorisation to raise the discharge limit. The rogue discharges, which come from the Fuel Handling Plant FHP, are of [Antimony-125](#) (Sb-125), a beta radiation emitter with a radioactive half life of 2.75 years. The release of the Sb-125 is directly associated with the process of de-canning higher burn-up Magnox fuels. [Radiation Free Lakeland accused](#) the Environment Agency of bias in its briefing on the application from Sellafield for an increase in Antimony-125 discharges, saying it is bound to increase other discharges such as tritium as well.

Sellafield Ltd is [expected to apply for an almost 5-fold increase](#) in its Sb-125 gas discharge limit. Sellafield wants the limit to be raised from its current level of 6.9 to Gigabequerels (GBq) to 30GBq. In early 2008 the limit was 2.3GBq but had to be raised to 6.9GBq when the discharge chimney sampling equipment was found to be under-reporting. The proposed increase to 30GBq is unlikely to be authorised until April next year when approval from the European Commission, under Euratom Article 37, is expected to be given. Whilst the current limit of 6.9GBq is likely to be breached between now and then, it is understood that discharges of other fission products released during the de-canning of Magnox fuel in the Fuel Handling Plant, whilst also on the increase, will remain within their respective site discharge limits

There is concern that, with the industry's historic failure to come up with any viable 'Plan B' for dealing with un-reprocessed Magnox fuel, further delays to processing the fuel will result in a stockpile of un-reprocessed fuel in 2016/17 when the worn out reprocessing plant will have to close.

12.0 Waste Storage Review

Radioactive waste from existing nuclear facilities is going to have to be stored above ground for at least 100 years, according to CoRWM. In July 2006 the committee recommended a major research and development programme on robust radioactive waste storage, including on security and resistance to terrorist attack. Both [CoRWM](#) and the [NDA](#) reported in March 2009 on their respective reviews of waste storage. NFLA [Radioactive Waste Management Policy Briefing No.19](#) summaries these two reviews.

October Update: The Scottish Government held a workshop on the development of Higher Activity Radioactive Waste policy on Wednesday 24th June 2009. The papers from the workshop are available on the [Scottish Government website](#), and a consultation document will be published in the autumn.

Points made at the workshop by NFLA representatives included: (1) Flexibility should not be the top priority of waste management policy, it should be meeting [environmental principles](#); (2) The consultation document will look silly without some mention of spent fuel. Scottish Government policy is opposed to reprocessing and should, therefore, favour declaring spent fuel a waste. The fact the Scottish Government does not currently have powers to deal with spent fuel should not mean the consultation only mentions intermediate and low level waste. (3) The reason why High Level Waste at Dounreay has now been reclassified as Intermediate Level Waste should be set out. (4) The consultation should seek views on whether plutonium stored at Dounreay should be declared a waste.

Concern was expressed that the Scottish policy of managing waste “near surface” could mean anything down to a depth of 100 metres. The environmental policy of “on-site, above-ground, monitorable, retrievable storage” might use the phrase “near surface” to simply allow for a store which is a bit more terrorist proof - with a turf roof, slightly below the surface, but not something which is so deep that it becomes waste dumping by another name.

The same goes for another phrase – “near site”. This might be used just to allow for a little flexibility - as Dounreay claimed it needed for the low level waste site at Buldoo - slightly off the licensed site. It should not involve transport over a long distance.

Concern was also expressed about the use of the waste hierarchy. It is dangerous to conflate radioactive materials with substances like paper and aluminium. It is particularly important to be careful how we talk about recycling. The industry often calls reprocessing recycling – whereas, in fact, it is a method of diluting and dispersing radioactivity around the environment. In the same way we have to be careful that “recycling” contaminated metals does not become an excuse to breach the concentrate and contain principle.

The Scottish Government is holding another consultation meeting on 24th November 2009 at Victoria Quay.

13.0 Plutonium Options

The future of the UK’s stockpile of over 100 tonnes of plutonium will be decided by the Government during 2009. The NDA began consultations on this in August 2008, with the publication of a [plutonium options study](#). This was followed by its [Plutonium – Credible Options Technical Summary](#) in January 2009. The Nuclear Free Local Authorities briefing on options for dealing with plutonium stockpiles available [here](#).

October Update: In July the Department of Energy and Climate Change published the first of two informal discussion documents on plutonium. The [pre-consultation discussion paper](#) looked at the key factors that could be used to compare long term plutonium management options. Factors listed for consideration include whether the energy value of the plutonium should be considered a valuable resource; how options reduce the value of plutonium to

terrorists, and what impact option might have on non proliferation policy. In [response to the paper the NFLA](#) said its preferred option would be to treat the plutonium as a waste.

A [second discussion paper](#) has now been published and considers the decision methodology and timetable for decision making. The Government wants comments on this paper before 30th November 2009. Comments on both papers should be taken into account when the Government runs a formal consultation later in 2009.

13.1 Sellafield MoX Plant

The only nuclear facility given the go-ahead since 1997 – the Sellafield MoX Plant (SMP) - has been an economic and technical failure. Designed to manufacture 120 tonnes of mixed plutonium and uranium oxide fuel every year, for overseas customers, the plant [has produced just 6.3 tonnes](#) over its seven year life at a [cost to the taxpayer of more than £1bn](#).

October Update: Building a new MoX plant would create thousands of jobs and £1bn of investment, [according to](#) Copeland MP Jamie Reed. The future of the existing Sellafield MoX Plant is officially [under review](#). The NDA [says in its annual report](#) that “*the performance of the Sellafield mixed oxide plant (SMP) remains under close scrutiny by the NDA Board*”.

According to the German newspaper, [Die Welt](#), a shipment of MoX from Sellafield to Grohnde NPP, which had been expected during September or October has been postponed.

The batch of eight Mox fuel assemblies made at Sellafield and later found to be “falsified” in its specification data after being shipped to Japan, and sent back to Sellafield – seven years ago [will be shipped to France](#), along with another eight, but not until 2014/15

14.0 Waste from new reactors

The Government says a repository dealing with legacy wastes could readily accommodate the smaller volumes of waste from new reactors. But the reactors most likely to be built in the UK will be more powerful, use about 15% less uranium and produce 30% less waste. However, this waste will be more radioactive by a factor of seven because more uranium is burned up. Neither government nor its regulators have assessed the "disposability" of spent nuclear fuel from new reactors, and there are some serious doubts about its suitability for placing, along with existing waste, in a deep geological dump. The NDA is keeping its assessments of this new waste secret. Waste from new reactors briefing available [here](#).

October Update: Radioactive waste from a new generation of nuclear power stations will have to be stored above ground for 100 years. Hugh Richards, of the Welsh Anti Nuclear Alliance (Wana), [told officials](#) at the Department of Energy and Climate Change: “*Both the promoters of new reactors and the Government have largely ignored the implications of those reactors discharging high burn-up spent fuel. New-build spent fuel, already acknowledged as twice as hot and twice as radioactive as legacy-spent fuel, will have to cool down for 100 years on each site before it can go for deep underground disposal*”.

15.0 High Level Waste (HLW)

The HLW facility at Sellafield has the potential to wipe out much of northern England and southern Scotland. Extremely dangerous liquid high level waste is stored in 21 stainless steel tanks, which contain around 2,100 kilograms (kg) of Caesium-137 in 1998, according to an [NFLA briefing](#) by the Institute for Resource and Security Studies, compared with the 30 kg released during the Chernobyl accident. The waste must be constantly cooled and

ventilated, because it is so radioactive it generates its own heat, otherwise the liquid could boil and start escaping, contaminating the surroundings. The NII says the [consequences of prolonged cooling failure](#) could be 'very severe'. The timings involved are very short. Cooling failure could lead to boiling after 12 hours, and to the tank drying out after three days.

The volume of highly radioactive liquor which can be stored is controlled by a legally binding specification issued by the NII, but [problems with the three evaporators](#) used to concentrate highly active liquors prior to storage and vitrification (turning into glass blocks) have made it difficult to reduce the volume.

The Institute for Resource and Security Studies submitted [evidence](#) to the House of Commons Defence Select Committee in January 2002, following 9/11, about the terrorist threat represented by the tanks. Estimates vary – but [some commentators have reported](#) that such an attack may require the evacuation of an area between Glasgow and Liverpool, and cause [around 2 million fatalities](#).

October Update: A 10-year programme of [carrying high-level nuclear](#) waste reprocessed at Sellafield back to the countries that own it is due to start via Barrow port between now and April 2010.

[Costain won a £297m contract](#) for full engineering, procurement and construction of a new evaporator - Evaporator D – for processing high level liquid waste. Copeland Borough Council approved an application for large sections of the plant to be delivered to the site directly by sea. The work will involve construction of a 'steady incline' ramp across a section of Sellafield beach, a cutting through the sand dune and the construction of a new bridge over the local River Ehen which divides the sand dune from the Sellafield site. Components that are 'too large to be transported by rail or road' will be delivered by sea in a number of freight modules. Local group [CORE suspects](#) a hidden agenda to allow delivery of reactor parts in future.

The first vital step to combat and reduce the [highest hazard area at Sellafield](#) – the High Level Waste (HLW) storage tanks – has been put out to tender by Sellafield Ltd. Invitations to tender for the work contract, which appeared recently in the Official Journal of the European Journal (OJEU), relates to 'the design and build of a highly active liquid effluent plant'. In a number of phases stretching over the next 8 or 9 years, the contract is believed to be worth up to £1.5Bn. The work is thought to include new storage tanks and possibly another new evaporator. Meanwhile the Nuclear Installations Inspectorate says the [risks of something serious](#) happening in Sellafield's old plants are far too high.

16.0 Reprocessing

Sellafield has two reprocessing plants which chemically separate plutonium and unused uranium from spent nuclear fuel. It is a completely unnecessary process only used for around 5 – 10% of spent fuel worldwide. The bulk of radioactive discharges going into the North-East Atlantic originate from Sellafield. The older of the two - the Magnox reprocessing plant - reprocesses spent fuel from Britain's first generation Magnox reactors, only two of which remain operational. The plant had been scheduled to close at the end of 2012 as part of the UK's strategy to meet its OSPAR commitments (See Radioactive Discharges) but now isn't expected to close until 2016 due to poor plant performance.

The newer of the two is the Thermal Oxide Reprocessing Plant (THORP), which opened in 1994 to reprocess spent fuel from Britain's newer Advanced Gas-cooled Reactors (AGRs), and overseas Light Water Reactors (LWRs). Like the Magnox plant, throughput at THORP

has neither been reliable nor to specification – with just over 5000 tons completed during the first ten years of operation, rather than the 7000 tons expected. Given the total order book was only 9,600 tons it should have closed around 2010/11. But various accidents have delayed closure until 2015/6. In fact the Norwegian environment group, [Bellona](#), was told recently it could still be operational in 2020.

October Update: In [mid-May](#) it looked as though THORP may have to close for a number of years after one of the three evaporators - used to condense highly radioactive liquid - was shut down. Whilst two new Evaporators are planned, the first is unlikely to come into service [until 2013/14 at the earliest](#). By the [end of May](#) THORP workers were told there was no danger of closure because the evaporator had been fixed. Despite these strenuous denials the plant [has been closed down](#) for a period of some seven months. [Sellafield Ltd said](#) the shut down had nothing to do with the earlier evaporator problem.

17.0 Dounreay

Dounreay in Caithness was the UK's centre of Fast Reactor research between 1955 and 1994 but is now [described](#) as Scotland's largest nuclear clean-up project. Fast reactors, generally fuelled by plutonium, can, at the same time as generating electricity, convert a useless form of uranium into more plutonium. In 1988 the programme was cancelled, officially because of costs, but Fast Reactors have been a disaster world-wide with serious technical problems.

An underground, 65-metre deep, shaft was used to dump intermediate level waste (ILW) between 1959 until 1977, when a chemical explosion brought the practice to an end. A second facility, the ILW silo - a concrete-lined box built just beneath the surface - was used to dispose of waste between 1971 and 1998. Both of these need to be emptied and the contents made safe. [Contractors started to prepare the ground](#) for a major new plant to be built to retrieve waste from the shaft and silo in March 2009.

Another major problem is the appearance of [radioactive particles](#) in the environment. These small fragments of irradiated nuclear fuel have been mostly found on the seabed, on the Dounreay foreshore and on Sandside Beach west of Dounreay, which is open to the public. All but [four of the particles](#) found off site have been on the Sandside beach. Two have been found at Murkle Beach and another two at Dunnet Beach - both east of Dounreay. 138 particles have been found on Sandside Beach up to June 2009. It will be around 200 years, before the activities of the larger particles have decayed sufficiently for them to no longer be considered a potential hazard. [Radioactive particles will keep polluting public beaches for decades to come](#). Improved monitoring of the beaches and the seabed and recovery of particles are really the only viable options. [Restrictions on seafood](#) from a two kilometer zone around Dounreay remain in place.

October Update: An area of seabed bigger than 10 football pitches [was monitored](#) over the summer. Independent experts estimate there may be [1,500 radioactive fragments buried](#) in the sediment close to old effluent discharge outlet which pose a significant hazard to public health. The disintegration of these fragments is believed to contribute to the number of smaller, less hazardous particles found on local beaches. [Over a hundred fragments](#) of spent nuclear fuel were removed from the seabed. The particles were detected and retrieved by a remotely-operated vehicle. 29 were in the higher hazard category defined by independent experts as a “significant” threat to health. Two small areas of radioactive contamination [have been detected](#) on the site zoned for the construction of the low-level waste disposal facility.

THE future for the [workforce at Vulcan](#) has become less secure now that it looks certain the Ministry of Defence will not be extending its current contract at its reactor base. Barring new

commercial work being found, the site is set to go into decommissioning mode in five years' time. Such an outcome would add a fresh headache to the public agencies currently battling to replace the 2000-plus jobs which are to go at the next-door site at Dounreay.

Over 600 tonnes of [foreign nuclear waste is to be kept in Scotland](#) despite promises it would be sent back to the countries of origin. The Scottish government has proposed storing the highly dangerous waste at Dounreay. But, under a bizarre radioactive swap scheme, a smaller volume of waste will be returned from England. The revelation has prompted outrage from anti-nuclear campaigners, who have accused the Government of breaking promises to prevent Scotland from becoming the world's nuclear dustbin. An alternative view is that the Government is adopting a more sound environmental principle of minimizing hazards by storing the waste at Dounreay. Where it is falling down is by endorsing the return of high level waste from Sellafield by way of substitution. This entails the sea shipment of waste in vessels and containers the safety of which has been much criticized. Tens of governments, including those in OSPAR and further afield in the Caribbean and Pacific, are strongly opposed to nuclear shipments.