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#### **1. Corruption of Governance**

On the basis of the Government's own evidence the UK does not need more nuclear power stations to reduce CO<sub>2</sub> emissions by 80% by 2050 and nuclear power is not the least expensive way of providing low carbon electricity, according to a new report published by Unlock Democracy and the Association for the Conservation of Energy. (1)

The January 2008 White Paper on Nuclear Power (2) concluded that nuclear power should have a role. But it was not based on any long-term assessment of electricity needs. DECC had only assessed demand up to 2025. Nor was there any assessment of the potential for energy efficiency. So with no long-term assessment of demand or the potential for efficiency the previous government decided we need ten new nuclear stations.

The Government also based its case for new reactors on the alleged need for an increase in generating capacity before 2025. It said we will need 60GW of new capacity (35GW of which needs to be renewable), bringing total capacity to 110GW by 2025. These figures were said to be based on an analysis by Redpoint. This does indeed show there will be a 32GW loss of capacity by 2025, but it doesn't say we need 60GW of new capacity – it merely adds up the effect of Government policies to arrive at this figure. So the 60GW figure is not based on an assessment of need. (3) Authors Ron Bailey and Lotte Blair conclude:

*“...the pre-determined policy of 10 new nuclear power stations created the ‘central assumption’ of the need ... Rather than the need driving the policy, the policy dictated the so-called need.”*

In fact Redpoint points out that the potential for renewable is far greater than the 28-29% (35GW) it was asked to look at. (4)

In July 2010 and March 2011 the Coalition Government published Pathways 2010 (5) and Pathways 2011 (6) presenting respectively 6 and 16 different scenarios, detailing various ways forward regarding energy policy in order to both keep the lights on and achieve 80% CO2 reductions by 2050. In 6 of the 16 pathways there is no need for new nuclear power stations.

The Government insists that electricity demand is likely to double, but the evidence shows something quite different. Of 17 Pathways produced only nine showed anything like a doubling of electricity demand. The others resulted in electricity demand levels ranging from a decrease of 5% to an increase of 53%.

Following the Fukushima accident, and public concern about nuclear safety, the Government Minister responsible for nuclear power, Charles Hendry MP, admitted on Radio 4 that energy security and 80% CO2 reductions could be achieved without new nuclear power – but claimed that it would cost more. (7) Hendry also told MPs that electricity from nuclear power was the cheapest source of electricity and will cost consumers between 6.8 and 9.9pence per/kWh. (8) However, Hendry's answer was based on the selective use of figures from the Mott MacDonald report. (9) There are other sources of electricity detailed in the Mott MacDonald report but not told to MPs, such as small and large-scale gas CHP and biomass CHP, which can provide electricity more cheaply. MPs were also not told that the Government thinks it is realistic to halve the cost of offshore wind by the end of the decade, thus making its costs 5.6 – 6.2 p/Kwh - so that source would also be cheaper than nuclear in the long term.

Mott MacDonald assumes a 60 year life for new reactors and a load factor of 86%, with little or no supporting evidence. Both of these are optimistic and could easily turn out to be wrong, thus increasing the cost of electricity from new reactors. Mott MacDonald also assumes a 4 – 5 year construction period, and a 10% cost of borrowing. Again both assumptions are optimistic.

The Government says nuclear is likely to become the least expensive form of low carbon electricity, citing modelling work done for DECC by Parsons Brinckerhoff. But this compares nuclear primarily to gas/coal/Carbon Capture and Storage and then to CHP and pumped storage - there is no comparison at all to the costs of other forms of low-carbon generation such as wind, wave, tidal, solar, biomass etc. And even CHP is not included in the summary chart.

The authors of the Corruption of Governance report call for a re-examination of the case for new nuclear reactors based on the correct evidence, and an inquiry into how this corruption of governance took place.

- (1) A Corruption of Governance? How Ministers and Parliament were Misled. ACE and Unlock Democracy, January 2012 [http://www.ukace.org/publications/ACE%20Campaigns%20\(2012-01\)%20-%20Corruption%20of%20Governance%20-%20Jan%202012](http://www.ukace.org/publications/ACE%20Campaigns%20(2012-01)%20-%20Corruption%20of%20Governance%20-%20Jan%202012)
- (2) Meeting the Energy Challenge A White Paper on Nuclear Power, January 2008, page 4 <http://webarchive.nationalarchives.gov.uk/+http://www.berr.gov.uk/files/file43006.pdf>
- (3) Implementation of the EU 2020 Renewables Target in the UK Electricity Sector: RO Reform, Redpoint June 2009. (see Figures 11 and 14) [http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20energy/Renewable%20Energy%20Strategy/1\\_20090715120542\\_e\\_@@\\_RedpointImplementationoftheEU2020RenewablesTargetintheUKElectricitySectorROReform.pdf](http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Renewable%20energy/Renewable%20Energy%20Strategy/1_20090715120542_e_@@_RedpointImplementationoftheEU2020RenewablesTargetintheUKElectricitySectorROReform.pdf)
- (4) See Figure 77.
- (5) 2050 Pathways Analysis, DECC July 2010 <http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/2050/216-2050-pathways-analysis-report.pdf>
- (6) 2050 Pathways, 2011, DECC March 2011, <http://www.decc.gov.uk/assets/decc/Consultations/2050/1343-2050-pathways-analysis-response-pt1.pdf>
- (7) Charles Hendry: The World this Weekend 10th April 2011

- (8) PQ No 43120 asked by Madeleine Moon MP and answered on 8th March 2011 Hansard col 272W  
(9) Mott MacDonald [2010], UK Generation Costs Update, June 2010, available at <http://www.decc.gov.uk/assets/decc/statistics/projections/71-uk-electricity-generation-costs-update-.pdf>

## 2. Nuclear Subsidies

Even before the Fukushima disaster, the long-awaited nuclear renaissance in the West seemed to be running out of steam. There were two main factors behind this failure; the new Generation III+ reactors produced to take account of the lessons of Chernobyl that would spearhead the revival were not living up to their promises, and, more importantly, banks were proving unwilling to provide finance, write Professor Steve Thomas in Platts Energy Economist. (1)

But the US and UK governments seem oblivious to the idea that Fukushima might have any implications for new build plants. Both are planning to subsidise new reactors with loan guarantees in the US and long-term Power Purchase Agreements at non-market prices in the UK.

Generation III reactors were originally expected to have an overnight (excluding finance charges) construction cost of no more than \$1,000/kW so that a typical 1,500 MW nuclear power plant would cost \$1.5 billion. This was much less than the few plants completed in the 1990s and, not by coincidence, a figure that meant power from new nuclear reactors would be competitive with power from gas-fired plants. But most recent serious cost estimates and bids in the past few years for Gen III+ designs have been of the order of \$6,000/kW.

Finance is only partly about build cost. The main issue is risk and comes from the poor record of nuclear plants being built to time and cost, a reputation only worsened by Olkiluoto and Flamanville. The banks have signalled that they are unwilling to bear this risk, leaving three sets of interests that might be able to take it on: the utilities, the vendor or the consumer in some form via the state. In the UK, despite the political rhetoric that a new nuclear program would receive no public subsidies, what is now likely to be on offer are Feed-in-Tariffs and long-term Contracts for Differences. These effectively ensure that all power from nuclear plants is guaranteed to be sold at a predictable price set outside the market.

EDF is the most likely developer in the UK. Whether it will go ahead with an EPR in the UK is likely to depend on whether the design can survive the problems at Olkiluoto and Flamanville and on how fully the CfDs are guaranteed to cover costs. Since the terms of these contracts will be regarded as commercially sensitive, the public will never know what it has signed up to. But, if construction goes ahead, it can be assumed strong cost-recovery guarantees are in place. How the European Commission will view such contracts, which are blatantly unfair state aid and therefore presumably illegal, remains to be seen.

If Gen III+ designs prove to be a blind alley, it raises the question of what options are open to the nuclear sector. Ten years ago, the industry answer would have been Generation IV designs. Unlike Gen III+, which evolved from existing Pressurised and Boiling Water Reactors, these would be based on radical new technologies. Six technologies were selected by the major nuclear countries as the most promising. However, ten years on, they seem no closer to commercial deployment. These designs were a mix of designs already pursued, such as sodium cooled fast reactors and helium/graphite high temperature reactors and totally untested options such as a lead-cooled fast reactor. The more familiar reactors have a very poor record so far, despite all major nuclear nations trying to develop them over the past 50 years. Demonstration fast reactors like Superphenix, Monju and Dounreay and high temperature reactors like THTR-300 and Fort St Vrain had highly problematic, often short lives.

How the nuclear industry is going to solve problems it has failed to solve over the past 50 years is not clear. The radical new designs require major technological development and progress and it is hard to see who will fund that. Small Modular Reactors, the latest 'rabbit out the nuclear hat' are generally based on scaled down BWR or PWR technology and illustrate the nuclear industry's schizophrenic attitude to reactor size.

The reality the nuclear industry may have to face is the one that has been around since Three Mile Island. Designing a PWR or BWR that can survive a loss of coolant and loss of site power and still be economic is simply not feasible. Fukushima may therefore mark the effective end of the nuclear renaissance in the West. Nevertheless, the UK and the US will probably build some new units proving only that if enough public money is thrown at nuclear power, new reactors can be built, but the scale of support needed will limit the number to no more than a handful and, as the lessons from Fukushima emerge, the designs available now may need significant and expensive modification.

- (1) Reprinted in Commodities Now 30<sup>th</sup> Jan 2012 <http://www.commodities-now.com/reports/power-and-energy/9806-prospects-for-nuclear-power-in-2012.html>

### 3. Complaint to European Commission

A group of politicians and environmentalists has submitted a formal complaint to the European commission. The Energy Fair group has drawn up the challenge with legal help. Its focus is on seven subsidies potentially on offer to new reactor operators in the UK. (1)

One of the largest incentives is the cap on liabilities for nuclear accidents. If the full cost of insuring against a nuclear disaster were included the price of nuclear electricity would rise by at least 14 Euro cents per KWh and perhaps as much as €2.36. (2)

Other subsidies in the complaint are: that uranium is exempted from a tax on fuels used to generate electricity, and that the UK government is proposing to provide support for the disposal of nuclear waste and a subsidy in the form of a feed-in tariff. (3)

The campaign, which is supported by Green Party MP Caroline Lucas, Keith Taylor MEP, French pressure group Sortir du Nucléaire and others, says the complaint "may" be followed by legal action in the courts.

*"The European Union has opted for opening up the energy market and is vigilant about creating a level playing field,"* said Dörte Fouquet, the lawyer who has been leading the preparation of the complaint. *"In this regard, the commission over the last years repeatedly underlined that distortion of the market is to a large extent caused by subsidies to the incumbents in the energy sector. This complaint aims to shed some light on the recent shift in the energy policy of the United Kingdom where strong signals point to yet another set of subsidies to the nuclear power plant operators,"* she added.

Mike Childs, Head of Policy, Research and Science at Friends of the Earth, said: *"The UK coalition government promised that nuclear power should not get any subsidies. That was a sensible decision that recognised that time-limited subsidies should only be given to new technologies, such as wind, solar, wave and tidal, to enable them to develop, become mature and be competitive. It's time for the nuclear subsidies to stop and this legal case is a useful contribution in achieving that aim."* (4)

A spokesman for the Department of Energy and Climate Change (DECC) said he was "confident" that the Department's proposals to reform the UK electricity market to incentivise low carbon electricity generation were *"entirely consistent"* with the Government's policy of no subsidies for new nuclear power. (5)

Responding to the complaint, Keith Parker, chief executive of the Nuclear Industry Association said: “There is no substance to the allegations put forward by Energy Fair that the UK Government is subsidising nuclear power. Nuclear liability is governed by international conventions of which the UK is a signatory. These arrangements are currently under review, with a significant increase in the liability cap being proposed. The Electricity Market Reform arrangements are designed to benefit all low-carbon energy sources and not the nuclear industry specifically.” (6)

- (1) Guardian 19<sup>th</sup> January 2012 <http://www.guardian.co.uk/environment/2012/jan/19/anti-nuclear-campaign-british-legal-challenge>
- (2) Utility Week 19<sup>th</sup> January 2012 [http://www.utilityweek.co.uk/news/news\\_story.asp?id=196409&title=Opponents+submit+complaint+over+UK+%27nuclear+subsidies%27+to+EU](http://www.utilityweek.co.uk/news/news_story.asp?id=196409&title=Opponents+submit+complaint+over+UK+%27nuclear+subsidies%27+to+EU)
- (3) Energy Fair Press Release <http://www.energyfair.org.uk/news-releases/legal-bid> See also: <http://www.energyfair.org.uk/actions>
- (4) Engineer Live 23<sup>rd</sup> Jan 2012 [http://www.engineerlive.com/Power-Engineer/Nuclear\\_Power/Lawyers\\_sent\\_complaint\\_to\\_European\\_Commission\\_about\\_subsidies\\_for\\_nuclear\\_power/23960/](http://www.engineerlive.com/Power-Engineer/Nuclear_Power/Lawyers_sent_complaint_to_European_Commission_about_subsidies_for_nuclear_power/23960/)
- (5) Out Law 24<sup>th</sup> Jan 2012 <http://www.out-law.com/en/articles/2012/january-/environmental-campaigners-complain-to-european-commission-about-nuclear-subsidies/>
- (6) Energy Live News 27<sup>th</sup> Jan 2012 <http://www.energylivenews.com/2012/01/27/nuclear-chief-no-substance-to-eu-legal-allegations/>

#### 4. Achieving Zero

With support from Greenpeace Environmental Trust, Fuel Poverty expert Dr Brenda Boardman has written a report (1) for the Environmental Change Institute at Oxford University which details how we might transform our buildings, which are responsible for almost half of UK CO<sub>2</sub> emissions, in the way we are going to have to if we are to achieve an 80% cut in those emissions by 2050. Improving the energy performance of our buildings increases energy security, reduces our exposure to rising and volatile fuel prices, reduces energy bills which helps to tackle fuel poverty, creates jobs, reduces the squeeze on living standards and will make our buildings better places to live and work.

*Achieving zero* provides the policy framework to ensure that all energy use in all buildings in the whole UK results in zero carbon emissions by 2050. This covers 26 million homes and 2 million business (i.e. non-domestic) properties. Zero carbon emissions do not mean zero energy use. The energy services that people want can be obtained with reduced energy demand combined with fuels of a low carbon intensity and building-integrated renewables.

The steady ratchetting up of minimum standards, together with other policies, is designed to ensure that the average existing property is at the top of band A on the energy performance certificate by 2050. At this level, it uses zero net energy – any energy required is provided by on-site renewables.

At least until 2025, the expectation is that gas will remain the main heating fuel, rather than electricity, while the carbon intensity of electricity remains high. The natural gas system will be decarbonised through the addition of green gas from anaerobic digestion thus prolonging the period of its carbon acceptability. Beyond 2025, the need for any space heating will disappear as properties are made low-energy or brought up to passivhaus standard. The demand for electricity use in lights and appliances could be halved by 2050 by further use of EU efficiency standards and some gentle constraint by building users.

- (1) *Achieving Zero: delivering future friendly buildings*. Brenda Boardman, Environmental Change Institute, January 2012. <http://www.eci.ox.ac.uk/research/energy/achievingzero/>

## 5. Emergency Planning – post Fukushima

*“In the event of the nuclear fallout extending beyond the perimeter wire ... the police will alert the endangered population by setting up a telephone chain ... you put on the answer-phone and someone says hello, you don't know me but if you're listening to this you've got cancer”.*

Ben Elton on the Torness Emergency Plan 1986. <http://www.youtube.com/watch?v=HMkHmaP-BLQ>

Detailed Emergency Planning Zones (DEPZs) around UK nuclear power stations are small compared with other countries - ranging from as little as 1 km for Heysham and Hartlepool to only 3.5km for Hinkley Point. American and French nuclear regulators recommend that DEPZs should be up to 50 miles (80km). The Fukushima incident clearly showed the need for UK evacuation plans to be fully revisited, especially where sites are planning to expand with new reactor build. Emergency evacuation plans were affected by serious damage to the transport infrastructure in eastern Japan, illustrating the need for careful planning. Some UK reactors would face serious problems in emergency evacuation due to the lack of evacuation routes – Mersea Island near Bradwell and main routes off Anglesey with Wylfa are obvious examples. (1)

The final Weightman report on the implications of the Fukushima accident for the UK nuclear industry (2) contains a considerable amount of discussion about the need for improvements in severe accident preparedness and nuclear emergency planning. The report notes that other countries have different approaches, some based on ‘extendibility’ and others having more detailed emergency planning zones: *“The lessons from Fukushima in this area show the need for effective pre-planned detailed emergency zones but which are easily extended in a controlled way ... the practicability and effectiveness of the arrangements for extending countermeasures beyond a small DEPZ in the event of more serious accidents should also be reviewed”*

The Government’s response to the Weightman Report (3) said the Nuclear Emergency Planning Liaison Group (NEPLG) has recommended that industry consider the planning assumptions for “beyond design basis accidents”. It also recommended that ONR should enforce a stronger testing regime for emergency plans which includes extendibility arrangements and overseas nuclear accident response. The NEPLG, which brings together organisations involved in off-site nuclear emergency preparedness and response, issues guidance to those involved in emergency planning which is available on the DECC website, along with the notes of NEPLG meetings and sub-groups. (4)

NEPLG conducted an initial review of emergency arrangements with particular regard to dealing with a prolonged event like Fukushima as a response to a recommendation of the interim Weightman report. (5) This focused in particular on four key areas: (a) radiation monitoring capacity, capability and co-ordination; (b) central government response; (c) extendibility; and (d) capacity and capability of emergency services including emergency exposures. While it found that current arrangements are “fit for purpose” it also identified “opportunities for improvement”. So a programme of work has been instigated. These areas will form part of a wider programme of work being taken forward by DECC. The timelines for this programme were to be finalised in October, and then taken forward by DECC as a priority. This was to include updating DECC’s published guidance on the UK’s response to an overseas nuclear incident by December 2011. But these target dates haven’t been met.

The interim Weightman report indicated a need to consider extending some emergency exercises to include severe accident scenarios. ONR is reviewing previous emergency exercises, but the findings are not yet publicly available. The findings and recommendations of the review have been presented and discussed with the Local Authorities responsible and some issues that are causing national difficulty were identified. None of the exercises were carried out post Fukushima.

NEPLG's Lessons Learned Sub Group noted in October 2011 that "*variable application of the principles of extendibility has been observed during the off site plan review process*". (6) NEPLG is to establish an Extendibility Sub-Group to revise its Consolidated Guidance to take account of the lessons learned from emergency exercises, Off Site Emergency Plan reviews and Fukushima.

It seems clear that the wise thing to do would be to increase the size of the DEPZs to something much more realistic such as 20 – 30kms. This is being discussed in some Site Stakeholder Groups. The Government may, however, try to avoid this as it will mean a much larger number of people being brought into the possible evacuation zone, receiving information about emergency planning and iodine tablets. This may not be the best way to build support for new reactor construction.

The Weightman report also states that generally, in the UK, there is no detailed consideration given to the resources and facilities required for the recovery phase of a major nuclear accident, and co-ordination and control of such activities. It adds that this is of particular importance in terms of the arrangements for radiological monitoring and protection of workers, and the need to train many contract workers who may have little or no familiarity with the hazards on a nuclear site.

NEPLG has a recovery sub-group. Its meeting on 11<sup>th</sup> Aug 2011 noted that the Recovery Plan will be trialled at Exercise OSCAR 10 at Sellafield 7-8<sup>th</sup> March 2012. The NFLA notes that most local authority recovery plans remain quite generic by nature, and points out that experience of widespread flooding and their reviews has shown that recovery planning is a difficult, complex and expensive part of the emergency planning process. The NFLAs have encouraged the Government and the NEPLG to consider in detail the issues around prolonged recovery planning for nuclear emergencies and to provide advice to local authorities on the issues that would arise.

- (1) NFLA Briefing No. 93 Nuclear Emergency Planning, December 2011  
[http://www.nuclearpolicy.info/docs/briefings/NFLA\\_Briefing\\_93\\_Nuclear\\_EP.pdf](http://www.nuclearpolicy.info/docs/briefings/NFLA_Briefing_93_Nuclear_EP.pdf)
- (2) Japanese Earthquake and Tsunami: Implications for the UK Nuclear Industry, Final Report, Chief Inspector of Nuclear Installations, ONR, September 2011  
<http://www.hse.gov.uk/nuclear/fukushima/final-report.pdf>
- (3) Government's response to the Weightman report, December 2011.  
<http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/nuclear/3718-gov-response-weightman-final.pdf>
- (4) Nuclear Emergency Planning, NuLeaf Steering Group, 25<sup>th</sup> Jan 2012  
[http://www.nuleaf.org.uk/nuleaf/documents/01-25-2012\\_SG\\_item\\_10\\_Nuclear\\_Emergency\\_Planning.pdf](http://www.nuleaf.org.uk/nuleaf/documents/01-25-2012_SG_item_10_Nuclear_Emergency_Planning.pdf)
- (5) Interim Report 18<sup>th</sup> May 2011 <http://www.hse.gov.uk/nuclear/fukushima/interim-report.pdf>  
**Recommendation 3:** The Nuclear Emergency Planning Liaison Group should instigate a review of the UK's national nuclear emergency arrangements in light of the experience of dealing with the prolonged Japanese event.
- (6) NEPLG Lessons Learned Sub Group: Review of Level 2 and Level 3 Exercises 2010-11, DECC October 2011. <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/nuclear/3176-nepglg-lessons-2010-11.pdf>

## 6. The only safe Fast Breeder is a rabbit

George Monbiot has been promoting Integral Fast Reactor's, like the Prism reactor, again. (1) This followed an article in *The Guardian* by Duncan Clark, (2) and an announcement by General Electric (GE) Hitachi in November that it would like to build a "Prism" (Power Reactor Innovative Small Modular) reactor at Sellafield in order to use up the UK's 82-tonne stockpile of plutonium. (3)

When you read the headlines of these articles you'd think that we had stumbled on to a "win-win" technology. Duncan Clark's article is called "*New generation of nuclear reactors could consume radioactive waste as fuel*". Monbiot goes for: "*You cannot wish Britain's nuclear waste away*".

But as Jean McSorley points out these reactor would use UK's plutonium stockpile the majority of which (approx 95%) is not actually designated as radioactive waste, but as a nuclear material. Anyone with knowledge of the industry would be aware of this distinction. The processing of plutonium into fuel, and its use in reactors, would however result in more nuclear waste. Once created, this waste would be added to substantial amounts of existing nuclear wastes for disposal – none of which can be used in reactors. (4)

Nuclear physicist and former Friends of the Earth campaigner Walt Patterson points out that between 1955 and 1995 the UK blew more than £4bn of taxpayers' money on fast reactors with nothing to show for it but a radioactive mess at Dounreay. The problem is not the reactor. The boilers have thousands of thin metal tubes with water on one side and molten sodium on the other. Every plant of this kind ever built has had boiler leaks with potential hydrogen explosions that make the plant impossible on an electricity system. (5)

Proponents of integral fast reactors have so far failed to answer three key questions: do these reactors work, how much do they cost, and how long will they take to build? Apart from Dounreay there have been many unsuccessful attempts to build a working fast reactor. The Japanese spent four decades and \$13bn trying. No one has built a fast reactor on a commercial basis. Even if these latest plans could be made to work, prism reactors do nothing to resolve the main problems with nuclear: the industry's repeated failure to build reactors on time and to budget. Even the Department of Energy and Climate Change's scientific adviser, David MacKay, says "*it isn't the nuclear fuel that's the expensive bit – it's the power stations and the other facilities that go with them.*"

We have a very small window in which to get a grip on our greenhouse gas emissions, but despite proven green technologies existing we are being asked to wait while an industry that has a track record for very costly failures researches yet another much-hyped but still theoretical new technology. You can make paper designs for anything, but that is a long way from sorting out the real world engineering and economic issues that will actually deliver affordable and low-carbon energy. Even if these reactors work it would take at least another decade and a half to get a commercial reactor up and running at Sellafield. In the short term, Renewables and Energy Efficiency are the best solution and because they are clean and are increasingly affordable, it would avoid the need for new nuclear power generation programmes - in any form including IFRs. That is why ideas like fast reactors work much better in the headlines than they do in fine print.

And there is a fundamental flaw in Monbiot's remarks about proliferation. In order to have an IFR functioning, you need to give access to Plutonium and that means potential access to abuse. Would the use of these reactors be restricted to nuclear weapons states?

*The Guardian* reported earlier (5) that the plan to build a plutonium-burning reactor at Sellafield had been rejected by the NDA. Internal emails seen by *The Guardian* revealed that the NDA regards the reactor technology as immature and commercially unproven. It would also create large amounts of plutonium-contaminated waste and increase the risk of terrorists acquiring nuclear weapons. In an email to GE on 29 November 2011, the NDA's strategy and technology director, Adrian Simper, said that the two organisations "*have struggled to reach a clear agreement on the work necessary to demonstrate credibility, without which neither NDA nor government can consider Prism further in the development of our strategy.*"

But according to the i-Nuclear website the NDA is still talking to GE Hitachi about building a Prism fast reactor at Sellafield. Bill Hamilton described *The Guardian's* report as "*completely without foundation.*" "*Discussions are ongoing.*" He said the NDA was prepared to provide financial support to develop the proposals if ongoing discussions demonstrate promise. GEH said in a statement. "*We are working to demonstrate the advantages of the proposal to the NDA and show why PRISM makes*



*the plutonium more proliferation-resistant than other options and can be readily deployed as soon as the licensing process allows". (6)*

GE Hitachi's Prism fast reactor would be a "game-changer" for the UK, said Eric Loewen, the GE Hitachi chief engineer in charge of the project. It could burn through the UK's huge stockpile of plutonium in about five years, he said. *"The policy drivers are to get rid of the plutonium as quickly as possible,"* Loewen said. *"In that case we would run the (Prism) reactor for 45 days to burn the plutonium in the fuel. After 45 days the fuel would meet IAEA standards for spent fuel,"* with a maximum radiation dose rate of 1Sv /hour at 1 meter's distance from the fuel. After the initial 45 day burn, the fuel would be offloaded from the reactors and put in storage for two to three years. Then, after all the plutonium burning had finished, the fuel could be put back into the reactors to burn the rest of the fuel for a normal commercial operating cycle, Loewen said. (7)

Meanwhile Japan's long and expensive pursuit of fast reactors now teeters on the brink of failure amid new government concerns about its runaway costs. The four-decade project has consumed more than \$13 billion in funding, so far producing only accidents, controversies and a single hour of electricity. The government last month decided on sharp budget cuts for the project, and one top nuclear official in November raised the possibility of scrapping the plan. (8)

- (1) Guardian 2<sup>nd</sup> Feb 2012 <http://www.guardian.co.uk/environment/georgemonbiot/2012/feb/02/nuclear-waste>
- (2) Guardian 2<sup>nd</sup> Feb 2012 <http://www.guardian.co.uk/environment/2012/feb/02/nuclear-reactors-consume-radioactive-waste>
- (3) Guardian 24<sup>th</sup> January 2012 <http://www.guardian.co.uk/environment/2012/jan/24/sellafield-plutonium-reactor-plans-rejected>
- (4) Guardian letters 8<sup>th</sup> Feb 2012 <http://www.guardian.co.uk/environment/2012/feb/08/renewed-push-for-nuclear-power>
- (5) Guardian 24<sup>th</sup> January 2012 <http://www.guardian.co.uk/environment/2012/jan/24/sellafield-plutonium-reactor-plans-rejected>
- (6) i-Nuclear.com 24<sup>th</sup> Jan 2012 <http://www.i-nuclear.com/2012/01/24/uk-nda-still-considering-ge-hitachi-fast-reactors-at-sellafield-for-plutonium-disposition/>
- (7) i-Nuclear.com Monthly 1<sup>st</sup> Feb 2012 <http://www.i-nuclear.com/i-nuclear-monthly/>
- (8) Washington Post 31<sup>st</sup> Jan 2012 [http://www.washingtonpost.com/world/japan-losing-hope-for-its-pricey-dream-reactor/2012/01/26/gIQAktERTQ\\_story.html](http://www.washingtonpost.com/world/japan-losing-hope-for-its-pricey-dream-reactor/2012/01/26/gIQAktERTQ_story.html)

## **7. Speeding up nuclear waste dumping**

The Minister of State for Energy, Charles Hendry, asked the Radioactive Waste Management Directorate (RWMD) to review the programme for implementing geological disposal of higher activity radioactive waste with a view to bringing the date for first waste emplacement forward from the planned 2040 date to 2029. He also wants the timescales for first emplacement of high level waste (currently 2075) and spent fuel and waste from new reactors (currently 2130) brought forward. The Nuclear Decommissioning Authority (NDA) has now published its preliminary response to this request. (1)

The NDA says it could begin disposal between four and 90 years sooner than previously planned, depending on the waste type. Earlier emplacement of waste in the as-yet un-built repository could be achieved by conducting some phases of the program simultaneously, rather than sequentially. Other possible means to bring forward the disposal dates for nuclear waste range from dividing the emplacement of some classes of waste into two phases, changing waste packaging concepts, and abandoning the currently planned underground vault design for a "deep borehole" concept. The latter would involve a 20-year period of research and development, the report said, but could enable the emplacement of high-level waste 30 years earlier than current plans, while disposal of spent fuel from new reactors could be brought forward by 90 years.

A key element for acceleration of the disposal programme is squeezing more AGR spent fuel into each package. Basically the report confirms that AGR spent fuel could be packaged with about the same efficiency as PWR spent fuel (2) so the number of AGR spent fuel rods in each canister would be doubled in comparison with previous plans.

Mathematically this alters DECC's distribution of costs between AGR and new reactor spent fuels - the unit disposal costs of AGR and new reactor spent fuel (in pounds per tonne of uranium) will essentially be the same. So the share of fixed costs for the GDR paid for by the taxpayer for the AGR spent fuel should reduce and the cost charged to new reactor operators should increase. Unless DECC increases the charge for new reactor spent fuel 'disposal' this will represent a fairly large subsidy to new reactor operators. (3)

Meanwhile the Office for Nuclear Regulation (ONR) and Environment Agency (EA) have published their reviews of the RWMD's Generic Disposal System Safety Case. (3) EA found that RWMD's GDF program appeared to have focused its safety case on intermediate level waste, to the exclusion of other wastes, and on deposition of the waste in "higher strength rock" to the exclusion of other geology types.

*"It is not clear from the [generic environmental safety case] whether RWMD has reviewed the features, events and processes and scenario development to determine the implications of assessing the wider range of wastes, materials and geological environments,"* the EA wrote.

The Office for Nuclear Regulation, in its review told RWMD that it would need to more carefully evaluate the implications of construction methods impinging on operation of the GDF. *"An unusual feature of a GDF is that construction is likely to progress in parallel with operation (waste emplacement),"* ONR said. *"This could lead to various fault scenarios in which construction impinges on operation or vice versa. RWMD will need to monitor this very closely, particularly with regard to the selection of the construction method, because of the potential risks involved. There could also be events during construction and operation that could affect post-closure safety, which RWMD will need to assess,"* ONR wrote.

- (1) NDA 22nd Dec 2012 <http://www.nda.gov.uk/news/geological-disposal-timescales.cfm>
- (2) see especially Page 20 of the report <http://www.nda.gov.uk/documents/upload/Geological-Disposal-Review-of-options-for-accelerating-implementation-of-the-Geological-Disposal-programme-December-2011.pdf>
- (3) See Ian Jackson's video for further explanation <http://www.youtube.com/watch?v=EmlSEYeTOIE>
- (4) I-Nuclear.com 10<sup>th</sup> January 2012 <http://www.i-nuclear.com/2012/01/10/uk-could-speed-up-nuclear-waste-disposal/>
- (5) See joint web pages: <http://www.environment-agency.gov.uk/business/sectors/111766.aspx>  
Joint Regulatory Scrutiny of RWMD's work relating to geological disposal of higher activity radioactive waste: Regulatory Review of the Generic System Safety Case, EA & ONR, December 2011  
<http://publications.environment-agency.gov.uk/PDF/GENW1211BVDX-E-E.pdf>  
See also ONR 11<sup>th</sup> Jan 2012 <http://www.hse.gov.uk/nuclear/news/2012/jan-geological-disposal.htm?ebul=gd-nuclear&cr=08/jan-12>

## 8. Waste Dumping Opposition Grows

Cumbria is "sleepwalking" towards accepting a nuclear dump that will ruin its landscape and distort its economy, according to a newly-formed group called Save Our Lake District, Don't Dump Cumbria. (1)

More than 200 people turned out to their first public meeting in Cockermouth on 2<sup>nd</sup> February to hear about the geology of West Cumbria, and its potential suitability to host a nuclear waste dump. Professor David Smythe held the audience's attention for more than an hour, showing how different

the geology is in other countries where deep disposal is being pursued, and describing the history of the search for a solution to the nuclear waste problem in the UK.

Prof Stuart Hazsledine from Edinburgh University warned that unless local people take the trouble to say 'No' at this point in the ongoing consultation, there might be no going back since the right of Withdrawal is vested in the Local Authorities, not the potential host site.

Stuart Haszeldine, writing in the Whitehaven News pointed out that nuclear waste dumping was decisively rejected after a £400million scientific investigation during the 1990s. Neither the rocks nor the science have changed since then. The security and performance of the proposed repository is extremely questionable. It is predicted by the disposal agencies' own studies that radioactive gas is likely to return to the surface within just tens of years. It is predicted by my own research that groundwater flowing past underground radioactive waste will return to the surface within only thousands of years. This groundwater will return to the surface much faster, within a few decades, if hot temperature, high level waste is also buried. That heat will also make the land surface rise. No earthquakes or extra rainfall are needed. A fundamental problem with this public information exercise is that no rival viewpoints are funded to be heard. If the elected councillors make a decision to participate in further site investigations, it becomes increasingly difficult for a disenfranchised local community to reverse out of the process. (3)

Meanwhile, plans have been announced for a large scale opinion survey to find out what people in West Cumbria think about the possibility of a nuclear waste repository being sited there. MORI has been commissioned by the West Cumbria Managing Radioactive Waste Safely Partnership to carry out a "statistically representative" poll by telephone around March 8. MORI will call up people randomly. A Partnership spokesman said: "*Some people have suggested there should be a referendum before a decision is made. However we concluded that a referendum would not be appropriate at this point. This is partly because it is not yet known where a repository might be sited and therefore there is only general information available on key issues such as safety, geology and the impact of constructing these facilities.*" (4)

- (1) Cumberland News 19<sup>th</sup> January 2012 <http://www.cumberlandnews.co.uk/new-nuclear-dump-would-harm-cumbrian-landscape-claims-pressure-group-1.916256?referrerPath=business>
- (2) Save Our Lake District Press Release 7<sup>th</sup> Feb 2012 <http://mrwsold.org.uk/wp-content/uploads/2011/10/SOLD-Press-release-Feb-7th-2012.doc>
- (3) Whitehaven News 2<sup>nd</sup> Feb 2012 <http://www.whitehavennews.co.uk/letters/you-say/the-nuclear-waste-debate-1.920956?referrerPath=letters/you-say>
- (4) Whitehaven News 9th Feb 2012 <http://www.whitehavennews.co.uk/news/plans-announced-for-large-scale-survey-on-nuclear-waste-repository-in-cumbria-1.923217?referrerPath=news>

## 9. Sellafield – cost overruns and delays taint new reactor programme

Delays in delivery of a new evaporator at Sellafield could bring an early end to reprocessing in the UK and have ramifications beyond the Sellafield site. (1) Evaporator D is Britain's biggest single nuclear project. It was originally estimated to cost £90m and was due to be completed as early as 2010. The NDA now says that the actual costs are now estimated to be "around £400m" and probably £100m more. It is currently scheduled for active commissioning in December 2015, (2) but that date is now considered unlikely to be met – meaning it could serve the Thorp reprocessing plant for substantially less than three years.

If Thorp has to be kept open beyond 2018 to handle the spent-fuel backlog, many tens of millions of pounds of extra money would have to be found to upgrade the already troubled facility to ensure it remained safe to operate. (3)

Cumbrians Opposed to a Radioactive Environment (CORE) spokesman Martin Forwood said:

*“What amounts to a 550% hike in the overall costs of Evaporator D will rank alongside the cream of the industry’s catalogue of procurement and management blunders. [The] project cannot now be scrapped - because too much has already been sunk into it, yet will struggle to serve the purpose it was originally designed for - securing the currently scheduled end of reprocessing. With the Project now mired in chaos and controversy, the NDA is going to have to eat humble pie and consider abandoning some of its reprocessing plans”.* (4)

- (1) i-Nuclear 13<sup>th</sup> January 2012 <http://www.i-nuclear.com/2012/01/13/evaporator-d-delay-could-mean-early-closure-for-thorp-site-wide-ramifications-2/>
- (2) i-Nuclear 7<sup>th</sup> February 2012 <http://www.i-nuclear.com/2012/02/07/sellafields-evaporator-d-to-come-in-at-well-below-1-billion-following-2009-redesign/>
- (3) Independent 14<sup>th</sup> February 2012 <http://www.independent.co.uk/environment/sellafield-faces-nuclear-option-as-overspending-threatens-plants-future-6898599.html>
- (4) CORE Press Release 5<sup>th</sup> Jan 2012 <http://www.corecumbria.co.uk/newsapp/pressreleases/pressmain.asp?StrNewsID=299>

### 10. Possible mechanism explaining leukaemia clusters

A new French study of childhood leukaemia near nuclear power plants has found a statistically significant increase in leukaemia in children below age 15 in 2002-2007 within 5 km of 19 French NPPs. The French finding is persuasive as it was determined in two separate ways. First, by a comprehensive nationwide case-control study, and second, by a conventional incidence study. Many newspapers in France (but none in the UK) carried this story prominently, but in fact it is the fourth European study showing this result. After the shocking results of the KiKK study in 2007, further studies with the same or similar findings were carried out in Germany, UK, and Switzerland. (1)

In September 2011, Gundremmingen Nuclear Power Plant in Southern Germany emitted much larger amounts of radioactive noble gases during inspection/refuelling than are emitted during normal power operation. According to the International Physicians for the Prevention of Nuclear War (IPPNW) in Germany, the normal emission concentration during the rest of the year is about 3 kBq/m<sup>3</sup>, but during inspection/refuelling (in the afternoon and evening of September 22nd) this concentration abruptly increased to ~700 kBq/m<sup>3</sup> with a peak of 1,470 kBq/m<sup>3</sup>. In the following days (September 22nd - 29th), the concentrations of released radioactive noble gases were still much higher (average = 100 kBq/m<sup>3</sup>) than during normal power operation. IPPNW warns of the probable health impacts of such large emission spikes. *“Especially at risk are unborn children. When reactors are open and releasing gases, pregnant women can incorporate much higher concentrations of radionuclides than at other times, mainly via respiration”* said Reinhold Thiel, member of the German IPPNW Board. *“Radioactive isotopes inhaled by the mother can reach the unborn child via the blood and placenta with the result that the embryo/fetus is contaminated (‘labelled’) by radioactive isotopes.”* (2)

This could prove a possible mechanism explaining leukaemia clusters close to German and French nuclear power plants. (3) In the light of the new German data, it is recommended half-hourly emissions data from all UK reactors should be disclosed and that the issue of childhood cancer increases near NPPs be re-examined. (4)

- (1) Dr Ian Fairlie 20<sup>th</sup> Jan 2012 <http://www.ianfairlie.org/uncategorized/new-french-study-on-childhood-leukemias-near-nuclear-power-plants/>
- (2) IPPNW Press Release 14<sup>th</sup> November 2011 <http://www.ippnw-europe.org/en/nuclear-energy-and-security.html?expand=707&cHash=8752881e4a>
- (3) Beyond Nuclear 1<sup>st</sup> Feb 2012 <http://www.beyondnuclear.org/children-health/2012/2/1/a-possible-mechanism-explaining-leukemia-clusters-close-to-g.html?SSLoginOk=true>
- (4) Dr Ian Fairlie 19<sup>th</sup> January 2012 <http://www.ianfairlie.org/uncategorized/radioactive-spikes-at-nuclear-power-stations/>