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- 1. It's the costs stupid**

When Siemens launched a joint nuclear venture with Rosatom, Russia's state nuclear company, in March 2009 it estimated that by 2030 there would be 400 new nuclear plants around the globe requiring a total investment of more than €1,000bn. Two and a half years later things look a little different and Siemens is quitting the nuclear industry. The Fukushima disaster hasn't helped but doubts about the so-called nuclear renaissance had already emerged before the disaster as a result of delays and cost-increases.

Nuclear is a risky business for shareholders and the margins are now potentially lower, according to James Stettler at UniCredit. But Siemens' continued involvement in the nuclear business also risked undermining its efforts to become a "*green infrastructure pioneer*" by selling products ranging from wind turbines to trains and smart electricity grids. (1)

Weak power demand because of the recession has also made it difficult to justify investment in new reactors. The International Atomic Energy Agency's (IAEA's) most recent projection is that the world will add up to 100-150 new reactors by 2020, with half of these in China. So while the global nuclear industry is growing overall, its share of electricity generation is likely to slip as other forms of generation grow more quickly. (2)

As a consequence companies in the nuclear industry have been repositioning themselves for a market less attractive than it was at the start of the year. Siemens isn't the only company pulling out. Shaw, the US civil engineering company, has decided to sell its 20% stake in Westinghouse, the nuclear engineering group, to Toshiba which is itself considering selling on part of its holding – which will be 87 per cent once the Shaw deal has gone through – to another investor. General Electric, the US industrial group that is one of the world's leading nuclear engineers through its joint venture with Hitachi of Japan, has said it does not hold out much hope for market growth in the immediate future.

Even here in the UK – which currently looks set to be the west's largest market for new reactors over the coming decade, Scottish and Southern Energy (SSE), one of the Big 6 utilities, announced it was

dropping out of the NuGen consortium with GDF Suez and Iberdrola to build reactors at Sellafield. The two remaining companies will buy up SSE's 25% share leaving them with 50% each.

The NuGen consortium is one of three consortiums looking to build nuclear reactors in the UK, with plans for two, or possibly three 1.6GW reactors at Sellafield. The first is scheduled to become operational in 2023 and the consortium is expected to take a final investment decision by 2015. Ian Marchant, chief executive of SSE, has previously sounded sceptical about the rationale for participating in the programme. In May, he said that SSE's strategic objective was to have "*more than our fair share of renewables and less than our fair share of nuclear*".

The SSE announcement has raised concerns that investors may see the British nuclear industry as unattractive despite government efforts to provide incentives. "*It sends a big signal to the government saying: 'Look you've got to give us more security'*," said Karen Dawson, director in the energy sector at consultancy Price Waterhouse Cooper. (4)

NuGen will have to make its multi-billion pound investment decision around 2015, but getting to that point will absorb, from now on, significant financial and management resources. The consortium is reported to have paid the Nuclear Decommissioning Authority (NDA) an 'up-front' payment for the land at Sellafield in 2009 of £19.5M with a further payment of £50.5M to be made over the next 6 years. NuGen applied, at the beginning of September, for planning permission from Copeland Borough Council to sink a number of exploratory boreholes on the site. (5) The area proposed for development forms part of a tract of land previously investigated by British Nuclear Fuels plc (BNFL) in 1992 for the potential construction of a Pressurised Water Reactor (PWR). Those investigations and subsequent responses to Freedom of Information requests by Greenpeace have revealed a number of issues in terms of the site's suitability for power station construction. These include a problematic geology – the depth of bedrock - which would add significantly to construction costs, and difficulties in extracting coolant water from the Irish Sea because of high levels plutonium-contamination on the sea-bed.

SSE concluded that its resources are better deployed on business activities and technologies where it has the greatest knowledge and experience. (6) The two remaining partners – Iberdrola and GDF Suez – say it will make no difference. They quickly reaffirmed their commitment. (7)

The nuclear industry hopes it has learned its lessons from the extensive cost overruns and schedule delays that characterized the 1970s and 1980s. But current data suggests that many new projects are not faring much better. (8)

A new US study released this month by the Texas Institute found a 70% certainty that a utility would see its borrowing costs rise due to the downgrading of its credit rating once construction of a new reactor begins. The study tracked the experience of 52 investor-owned utilities that built nuclear power plants from 1960 to the present. Between the '60s and early '80s, the flurry of plant construction was marred by massive cost overruns and electric-rate increases. Twelve percent of the utilities defaulted on their debts. The financial costs were so great that no utility was willing to launch a new project, and half of those approved by regulators were scrapped by utilities themselves over costs concerns. (9)

Confirming this Moody's lowered the credit rating of the SCANA Corporation because of concerns about the large amount of money that will have to be borrowed for its nuclear construction program at the V.C. Summer plant in Fairfield County. Its subsidiary, South Carolina Electric & Gas Co, is spending \$5.8 billion to fund its 55% share of two new reactors at the Jenkinsville facility. (10)

Despite the risks sovereign wealth funds from the Middle East and other oil-rich areas are "*queuing up*" to invest in UK nuclear power, according to energy minister Charles Hendry. Experts have been worried that the UK will find it difficult to attract enough companies willing to fund an estimated £40bn for new nuclear plants. However, Mr Hendry is no longer concerned about this, since key

government ministers have been courting cash-rich foreign funds. "It's going to be easier to find the funding than it is to find the capacity to build it," Mr Hendry said. "Some of the sovereign wealth funds are keen to invest as a way to diversify. They are showing a very keen interest in British nuclear and queuing up to know more about the opportunities. In the course of our travels we highlighted the opportunities to them." (11)

Hendry told the Tory Party Conference that the UK is the most exciting place in the world for new nuclear build: "We are addressing the issues of planning, of approving the reactor designs and reforming our electricity market, so the UK is now the most exciting place in Europe, if not the world, for nuclear new build. (12)

(1) FT 19th September 2011 <http://www.ft.com/cms/s/0/681a050e-e2d2-11e0-93d9-00144feabdc0.html>

(2) FT 28th September 2011 <http://www.ft.com/cms/s/0/765c917c-e836-11e0-9fc7-00144feab49a.html>

(3) FT 21st September 2011 <http://www.ft.com/cms/s/0/c8b634ec-e470-11e0-92a3-00144feabdc0.html>

(4) Reuters 23rd September 2011 <http://www.reuters.com/article/2011/09/23/us-britain-nuclear-see-idUSTRE78M60S20110923>

(5) CORE Press Release 23rd September 2011

<http://www.corecumbria.co.uk/newsapp/pressreleases/pressmain.asp?StrNewsID=292>

(6) Telegraph 23rd September 2011

<http://www.telegraph.co.uk/finance/newsbysector/energy/8785655/Scottish-and-Southern-Energy-abandons-nuclear-plans-for-wind.html>

(7) Whitehaven News 29th September 2011 <http://www.whitehavennews.co.uk/news/nuclear-new-build-plans-still-on-track-1.882588?referrerPath=news/>

(8) Passing the starting line: Nuclear Construction Risk, Ernst & Young, September 2011

[http://www.ey.com/Publication/vwLUAssets/Passing_the_starting_line_-_nuclear_construction_risk/\\$File/Nuclear_construction_risk.pdf](http://www.ey.com/Publication/vwLUAssets/Passing_the_starting_line_-_nuclear_construction_risk/$File/Nuclear_construction_risk.pdf)

Construction Risks in new nuclear power projects – Eyes Wide Open, KPMG, September 2011

<http://www.kpmg.com/uk/en/issuesandinsights/articlespublications/pages/constructionriskinnewnuclearpowerprojectseyeswideopen.aspx>

(9) Savannah Now 26th September 2011 <http://m.savannahnow.com/news/2011-09-26/costs-nuclear-reactors-have-been-steep-many-utilities>

Texas Institute 13th September 2011 http://www.texasinstitute.org/news/press-releases/item/for-immediate-release-new-texas-institute-study-on-nuclear-power-projects-financing-2.html?category_id=58

(10) Colombia Business Report 19th Sept 2011

<http://www.columbiabusinessreport.com/news/41046-moody-rsquo-s-lowers-scana-rsquo-s-credit-rating?rss=0>

(11) Telegraph 5th Oct 2011

<http://www.telegraph.co.uk/finance/newsbysector/energy/8806965/Middle-East-sovereign-wealth-funds-queue-up-to-invest-in-UK-nuclear-power-stations.html>

(12) Cumberland News 4th Oct 2011 <http://www.cumberlandnews.co.uk/government-committed-to-the-uk-as-a-nuclear-nation-tory-conference-told-1.884184?referrerPath=business>

2. Trouble on the Horizon

RWE Npower has been busy denying rumours that it is considering pulling out of the Horizon consortium with Eon that is planning to build new reactors at Wylfa on the Island of Anglesey and Oldbury in Gloucestershire. (1) Volker Beckers, chief executive of Npower, said: "We are still recruiting people and spending almost a million pounds every week." Horizon says its activity was being ramped up significantly, and it is due to decide at the end of this year which kind of reactor to build at Wylfa.

But the *Daily Mail* reported RWE is looking for a way to pull out of the Horizon consortium, because of the costs. (2) *The Guardian* also reported that RWE is reviewing whether to scale down or abandon its UK nuclear programme, and has started an internal probe of its plans Well-placed sources told *The Guardian* "...there are a lot of discussions about all aspects of it including whether new partners could be brought in." (3)

Meanwhile, the scale of the proposals for new reactors at Wylfa and their impact on the surrounding environment is becoming clearer. It promises to be one of the biggest industrial developments in Wales. Horizon has been outlining its consultation plans. (4) A third bridge across the Menai Strait could be needed because freight and car traffic to the proposed Wylfa B plant would add to congestion on the two existing road links. (5) And an extra reservoir could be needed to cope with additional demand on water supplies on Anglesey. (6) Accommodation will have to be found for the influx of 5,000 workers during its construction. (7)

Later this month anti-nuclear pressure group Pobl Atal Wylfa B (PAWB), will hold a conference at Galeri in Caernarfon. PAWB spokesman Dylan Morgan said: *“The nuclear disaster at Fukushima has dealt the nuclear industry a severe blow internationally. But the Westminster coalition government and Horizon still want to build new nuclear power stations. We want people to come to the conference to listen to the arguments against nuclear power and in favour of a sustainable future for Wales through a comprehensive programme of energy conservation and development of the various types of renewable energy.”* (8)

The indefatigable Dr Gerry Wolff continues to highlight the renewable potential of Wales and Anglesey (9) and the Nuclear Free Local Authorities has published a briefing entitled “Realising a Welsh ‘Renewables Revolution’ in future energy policy”. (10)

- (1) Bristol Evening Post 11th October 2011 <http://www.thisisbristol.co.uk/story-13528925-detail/story.html>
- (2) Daily Mail 6th Oct 2011 <http://www.dailymail.co.uk/money/markets/article-2046213/Britains-nuclear-future-bright-firms-look-exit-strategy.html?ITO=1490>
- (3) Guardian 7th Oct 2011 <http://www.guardian.co.uk/environment/2011/oct/07/rwe-uk-nuclear-power>
- (4) BBC 26th Sept 2011 <http://www.bbc.co.uk/news/uk-wales-15069393>
- (5) BBC 26th Sept 2011 <http://www.bbc.co.uk/news/uk-wales-north-west-wales-15058487>
- Daily Post 26th Sept 2011 <http://www.dailypost.co.uk/news/north-wales-news/2011/09/26/third-menai-strait-bridge-may-be-needed-for-wylfa-b-construction-55578-29486738/>
- (6) Daily Post 4th Oct 2011 <http://www.dailypost.co.uk/news/north-wales-news/2011/10/04/wylfa-b-reservoir-study-undertaken-55578-29532022/>
- (7) Holyhead & Anglesey Mail 5th Oct 2011 <http://www.theonlinemail.co.uk/bangor-and-anglesey-news/local-bangor-and-anglesey-news/2011/10/05/wylfa-b-development-discussed-by-cprw-pawb-will-hold-an-anti-nuclear-conference-on-october-22-66580-29534224/>
- (8) North Wales Chronicle 7th Oct 2011 <http://www.northwaleschronicle.co.uk/news/106936/green-conference-at-galeri-caernarfon.aspx>
- (9) http://www.mng.org.uk/gh/media/no_nukes/daily_post_2011-09-21a.jpg
- (10) http://www.nuclearpolicy.info/docs/briefings/NFLA_PB_90_Welsh_energy_report.pdf

3. Energy Costs

As highlighted in Nuclear News No.32, the right wing press has been attacking Government policies on renewable energy and climate change. Articles about rising energy costs seem to focus on renewable energy, rather than blaming nuclear, which will benefit even more from Electricity Market Reform. The Institute of Economic Affairs says the Government’s obsession with renewable energy will add £500 to fuel bills by 2015. (1) *The Daily Telegraph* launched a stinging attack on Chris Huhne and his *“ruinous fixation with costly renewable power generation ... Specifically, we are investing more in offshore windfarms than any other country, and the economics of the policy are crippling.”* It says offshore wind will cost £149 per MWh compared with £97/MWh for nuclear. (2)

Despite some admirable exceptions, the rump of the Conservative Party faithful remains deeply ambivalent about the government’s climate change agenda, sceptical about the need for many green policies, and convinced that environmental taxes and targets are damaging the economy and driving up energy bills. It sees offshore wind as too expensive, based on current costs, but fails to consider the fact that as a relatively new technology the potential for cost reductions are huge. The UK Energy Research Centre which came up with the £149/MWh figure has a plan for reducing costs over the next decade. (3) Offshore wind costs are relatively transparent and it is clear what subsidies the

Government is giving to the industry. The costs of new nuclear reactors, on the other hand, are largely theoretical and rely on the industry's optimistic projections with public subsidies hidden. According to Professor Steve Thomas if capital costs turn out to be closer to the sorts of figures being discussed in the US, electricity costs will be closer to £140/MWh - £210/MWh depending on the discount rate, and using a more realistic figure for the discount rate for waste and decommissioning costs than is used by the Government's consultants this could increase to £250/MWh. (4)

But Chancellor George Osborne chose to go down the populist route in his speech to the Tory Party Conference and criticised current green policies for "*piling costs on the energy bills of households and companies*". He argued that we should not pursue green policies that put our country "out of business", and pledged that "*at the very least ... we're going to cut our carbon emissions no slower but also no faster than our fellow countries in Europe*".

Osborne may have been playing to the gallery, but in doing so he has dealt a blow to green investor certainty and issued a direct challenge to colleagues, including the Prime Minister, who want to establish the UK as a low carbon leader rather than a follower. (5)

Household energy bills will soon be as unaffordable as they were in the bleak years of the 1970s, reports *The Times*. Four per cent of all consumer spending will be eaten up by the cost of heating and lighting the home by 2015, according to Deutsche Bank. It said that the cost was expected to rise by a quarter over the next four years. Analysts blamed the likely increases on rising global energy prices and costly subsidies for wind power and energy efficiency. (6) Deutsche said that the impact of energy costs on households could be lessened by abandoning Britain's green targets. Sam Laidlaw, the chief executive of Centrica, warned recently that this would be necessary if public resistance to higher bills continued. The bank also warned that companies needed to start building new power plants within two years to replace ageing coal plants being shut down. But it said that this would not be viable unless wholesale electricity prices rose by 50%.

Osborne's statements in Manchester caused anger at DECC because it exaggerated the impact of green policies on energy bills. "*It's factually not accurate and therefore just scaremongering. It made us wonder whether George actually understands the scale of the reductions in energy bills we are trying to bring about and, in general, what we are trying to do.*" What is clear is that the politics have changed, if not yet the policies, according to Tim Montgomery, editor of *Conservative Home*. "*The government has decided that this is now a vote-losing issue,*" he said. "*Soaring energy prices are what has forced Cameron to change. The government is now in sync with the vast majority of the Tory party who think it is futile to try to tackle climate change without a world agreement.*" (7)

The problem, according to Andy Atkins, the director of Friends of the Earth, is that the Tories are panicking about the lack of growth, and don't understand the green economy. Guy Newey, at the rightwing think-tank Policy Exchange, said: "*The rhetoric – or ignoring the subject in Cameron's case – will raise real concerns among investors about whether the UK is serious about climate policy.*" At the start of the Tory Party Conference just as Osborne was taking to the stage, the energy minister Charles Hendry told a fringe meeting on renewable energy: "*The UK can be a leader or a follower. This is an incredible opportunity, and if we follow we will export jobs and import equipment.*" The climate change minister, Greg Barker, then extolled the government's "*world leading*" programme to refurbish 14m homes in the UK to save energy. But in the main hall Osborne was telling delegates: "*We're not going to save the planet by putting our country out of business.*"

Virtually all the delegates supported Osborne's statements, with wind turbines dismissed as a waste of time and road building the favoured choice of infrastructure investment. Tom Burke, who advised Michael Heseltine, John Gummer and Michael Howard on the environment, said: "*The leadership are getting the politics badly wrong, as the change is being interpreted as the return of the nasty party. Green vision was central to Cameron's detoxification of the party: without it what is left?*"

Andrew Pendleton of the left leaning think-tank IPPR said if Osborne gives up the lead on climate change he can kiss good-bye to the recovery. In recent IPPR consumer focus groups examining the key issue of the rising costs of energy and the affordability of household heating – which is also a critical poverty and health issue – people in a variety of different homes and locations told us that they thought it was important to spend some money on new forms of energy, but that they would like to know what they are paying and on what it is spent. (8)

Guy Newey, at the rightwing think-tank Policy Exchange, says we need a sober discussion about how we meet our carbon targets as cheaply as possible. And the first thing to go should be the EU 2020 renewable energy target. He says this requires the rapid roll-out of tens of billions of pounds worth of offshore wind by 2020, an eye-wateringly pricey technology. (9)

As we go to press DECC has announced the membership of an Offshore Wind Cost-reduction Task Force. It will be chaired by Andrew Jamieson the current chair of Renewable-UK. (10) The Task Force was announced as part of the Government's Renewable Energy Roadmap in July 2011 which aims to reduce the cost of offshore wind to £100/MWh by 2020 – which means it will produce electricity at about the same cost as nuclear power is supposed to be able to when new stations start to open in 2020.

Maria McCaffery, Chief Executive of RenewableUK, said: *"We know the costs of offshore wind are too high. The industry is committed to driving down the cost of offshore wind energy. We can reduce costs by as much as a third over the next decade. But this will need a large enough market to promote competition and drive innovation. Working with the government we can deliver 20GW by 2020 if costs fall"*. (11) However, this cost reduction could be lost altogether if a lack of Government ambition fails to stimulate competition and innovation, or exchange rates and steel prices move the wrong way. (12)

As we pointed out in NuClear News No.31, nuclear costs are extremely likely to escalate. The Government's Committee on Climate Change (CCC) claimed in May that building more nuclear power stations would be a cheaper option than building offshore wind farms. (13) This was based on the Mott MacDonald report prepared for DECC in June 2010. Mott MacDonald's new report in May 2011 says the relative cost of different energy-generating technologies actually depends on which technology is given priority by policy makers.

It is widely agreed that energy prices will increase over the next 20 years whatever we do, which makes it all the more important that the needs of the increasing number of households living in fuel poverty are taken into consideration. It is still unclear whether the Green Deal will deliver the promised energy efficiency savings. Surely it must now be time to implement a much more ambitious energy efficiency programme, which could obviate the need for new reactors, rather than gambling on the possibility that this time nuclear reactors will be built to time and cost.

- (1) This is Money 15th September 2011 <http://www.thisismoney.co.uk/money/bills/article-2037645/Obsession-renewable-energy-add-500-UK-households-fuel-years.html>
- (2) Telegraph 20th September 2011 <http://www.telegraph.co.uk/comment/telegraph-view/8776624/Its-Chris-Huhnes-windfarms-that-are-inflating-energy-bills.html>
- (3) Telegraph 27th Sept 2010 <http://www.telegraph.co.uk/earth/energy/windpower/8028328/Britains-offshore-windpower-costs-twice-as-much-as-coal-and-gas-generated-electricity.html>
- (4) See Cost of Nuclear Power Briefing February 2011 <http://www.no2nuclearpower.org.uk/reports/EconomicsBriefing.pdf>
- (5) Business Green 3rd Oct 2011 <http://www.businessgreen.com/bg/james-blog/2113981/green-economy-sacrificed-osborne-plays-climate-ambivalence>
- (6) Times 11th Oct 2011 <http://www.thetimes.co.uk/tto/business/article3190270.ece>
- (7) Guardian 6th Oct 2011 <http://www.guardian.co.uk/environment/2011/oct/06/david-cameron-green-agenda-fades?intcmp=239>
- (8) Left Foot Forward 10th Oct 2011 <http://www.leftfootforward.org/2011/10/ipp-r-george-osborne-climate-change-economic-recovery/>

- (9) Guardian 12th Oct 2011 <http://www.guardian.co.uk/environment/2011/oct/12/george-osborne-environment?newsfeed=true>
- (10) DECC Press Release 12th Oct 2011
http://www.decc.gov.uk/en/content/cms/news/pn11_81/pn11_81.aspx
- (11) Renewable UK Press Release 29th June 2011
<http://www.bwea.com/media/news/articles/pr20110629.html>
- (12) Offshore Wind: forecasts of future costs & benefits, Renewable UK, June 2011
http://www.bwea.com/pdf/publications/Offshore_report.pdf
- (13) Telegraph 9th May 2011
<http://www.telegraph.co.uk/earth/energy/nuclearpower/8501816/Nuclearpower-cheaper-option-than-offshore-wind-farms.html>

4. Labour's Shadow Ministerial Team

The axing of Meg Hillier as shadow minister for Energy and Climate Change had been rumoured for some time, after she faced particular criticism for failing to make more political capital out of a series of u-turns at DECC, such as the watering down of the Green Investment Bank, delays to the Green Deal legislation, and controversial cuts to solar energy feed-in-tariffs. There were also complaints that Labour was failing to take full advantage of dissatisfaction over rising energy bills.

Caroline Flint, who has taken over, has no particular history in the environmental sector. She will be expected to orchestrate the opposition position on a raft of upcoming green policies, such as the electricity market reforms. In particular, she will be expected to flesh out proposals put forward by Ed Miliband last week to break up the dominance of the Big Six energy providers, and re-assert Labour's appeal to green businesses and voters after the Conservatives appeared to back away from an environmental agenda at their Annual Conference. (1) (Interestingly Tory climate minister Greg Barker tweeted during the Labour Conference: "*Energy market is 'rigged', says Ed. What exactly did he do about it in two years as Energy Sec?*" (2))

Huw Irranca-Davies, who was shadow energy minister, has gone back to environment. He spoke at a Nuclear Industry Association fringe meeting at the Labour Conference with John Robertson MP, chair of a parliamentary nuclear group. Clearly he felt secure enough in the nuclear industry's affection to warn it against taking him for granted. The new nuclear plants had to be built on time and on budget, he said sternly. "*And I don't want nuclear to be used as a disguise for walking away from renewables. We will be watching with an eagle eye.*" Quite what he will do when UK reactors start down the Olkiluoto road isn't clear. A Labour party member asked the panel how much subsidy the nuclear industry received and whether it would be better used in funding a huge energy efficiency drive. He didn't get an answer except for one from Wandsworth Tory councillor Malcolm Grimston who said it was only because of the "farce" the coalition has got into that it can't call its support for nuclear a "subsidy" because of the political contortion needed to keep the anti-nuclear LibDem party on board. (3)

Jack Dromey – the Labour Party's Deputy Leader's husband - former Deputy General Secretary of the Transport and General Workers' Union and Unite, and now a shadow communities and local government minister called UK nuclear power as a "*sunrise industry*" and dismissed safety fears. "*The possibility of a Fukushima-type accident in Britain is as remote as me getting hit by a meteor,*" he told a Labour conference fringe meeting. The MP urged ministers to ensure British firms benefited from plans to build a new generation of reactors. He said Labour would never play party politics with the nuclear issue, and there was a genuine cross-party agreement that new reactors were needed. Andy Rowell, of the Nuclear SpinWatch website, said: "*For the last few years, the nuclear industry has tried to persuade the British public that it is green, safe and cost-effective, but each one is a false promise. Fukushima once again showed us the dangers of nuclear power. It will make only a minimal contribution to tackling climate change, and money could be much more effectively spent on other carbon abatement projects like energy efficiency.*" (4)

According to *The Telegraph* the only person known to have been hit by a meteorite was a woman in Alabama in 1954. The 8lb rock hurt her shoulder after crashing through the roof of her house. (5) But the estimated probability of major nuclear accidents, which was considered very small in the past, has increased significantly. The pre-Fukushima estimate for the probability of a major nuclear accident was roughly 1 in 100,000 for the 440 reactors in operation over the next 20–25 years. But the likelihood of core melt and containment failure had been underestimated: the accidents in Chernobyl and Fukushima amount to catastrophic meltdown in four nuclear reactors over the past few decades, more than originally assumed. A simple calculation shows that in reality, the probability of any of the currently operating nuclear reactor having a major accident over the next 20–25 years is 1 in 5000. This means that another major nuclear accident can be expected to occur once every 20 years. Based on the earlier estimate, we were expecting one accident over a 100-year period. (6)

- (1) Business Green 7th October 2011 <http://www.businessgreen.com/bg/news/2115505/caroline-flint-bags-shadow-energy-climate-change-post>
- (2) Business Green 27th September 2011 <http://www.businessgreen.com/bg/james-blog/2112507/labour-s-green-policy-attacks-resonate-alternative-vision>
- (3) Guardian 28th September 2011 <http://www.guardian.co.uk/environment/damian-carrington-blog/2011/sep/28/labour-nuclear-power-subsidy-horizon?newsfeed=true>
- (4) BBC 26th Sept 2011 <http://www.bbc.co.uk/news/uk-politics-15063596>
- (5) Telegraph 31st July 2006 <http://www.telegraph.co.uk/news/1525235/What-chance-of-being-hit-by-a-meteorite-Dont-ask-a-scientist.html>
- (6) Science and Development Network 28th September 2011 <http://www.scidev.net/en/climate-change-and-energy/nuclear-power-after-fukushima/opinions/reality-check-shows-nuclear-energy-is-the-wrong-path-1.html>

5. Nuclear Subsidies

Caroline Flint's first statement as Shadow Energy and Climate Change Secretary was a huge disappointment. She was responding to the publication of the final Weightman Report on the implications of the Japanese earthquake and tsunami for the UK's nuclear industry. She said:

“Nothing in the Weightman Report calls into question a continued role for nuclear power in the UK as part of a more sustainable and balanced future energy mix. Now the Tory-led Government needs to give investors the support and confidence they need to deliver the construction of new capacity in the nuclear industry.” (1)

It's a disappointment because it comes after Kerry McCarthy, former Shadow Economic Secretary (now shifted to a Foreign Office brief) said *“the Government explicitly promised voters that they would not grant nuclear power stations a public subsidy [and the Carbon Floor Price is not the] only nuclear subsidy by stealth that the Government are trying to sneak past the House ... The Government are using money taken from people and from energy-intensive industries to subsidise nuclear power stations, which they explicitly promised voters they would not do. They are also using that money to subsidise existing power stations, which makes no sense”*. (2)

And it comes after pressure has been mounting on the government to include a windfall tax on nuclear operators as part of its electricity market reforms, after the LibDems Conference voted in favour of a new levy on existing nuclear power plants. (3) As Friends of the Earth says the aim of the tax would be to prevent nuclear producers receiving millions of pounds of extra profit when a carbon floor price is introduced in April 2012. (4)

At the Labour Party Conference, EDF let slip they are gearing up their lobbying machine to ensure that this new £1bn nuclear 'subsidy-on-the-sly' adds to their profits, rather than going to help those struggling to pay their electricity bills. At a packed CBI breakfast fringe meeting EDF was asked whether they would support or stand in the way of lobbying efforts for a 'windfall tax' that would ensure this £1bn would be used to help the those most vulnerable to energy price hikes. To many people's astonishment Dr Andy Spurr from EDF confirmed in blunt terms that they were planning to

lobby against a new windfall tax because they wanted to plough the money back into their own business and increase profits to make their business more financially sustainable.

At a time when half a million more people have been pushed into fuel poverty by recent price hikes and the combined profits of the big six energy companies was £3billion last year, this is hardly the message EDF's PR department was hoping for! Proceeds of a windfall tax should be invested in insulating the homes of the fuel poor as well as a new technology innovation fund to help energy intensive industry lower its carbon emissions. (5)

If the Government is really serious about standing up for consumers it should stop bailing out an ever more expensive nuclear industry by the back door.

- (1) Labour Party Press Release 11th October 2011 http://www.labour.org.uk/safety-of-uks-nuclear-industry-paramount,2011-10-11?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+LabourPartyNews+%28The+Labour+Party+-+Latest+news%29
- (2) Hansard 5th July 2011 <http://www.publications.parliament.uk/pa/cm201011/cmhansrd/cm110705/debtext/110705-0003.htm>
- (3) Business Green 21st September 2011 <http://www.businessgreen.com/bg/news/2110953/lib-dems-vote-favour-nuclear-windfall-tax>
- (4) Ekklesia 21st September 2011 <http://www.ekkleisia.co.uk/node/15414>
- (5) Greenpeace Blog 26th Sept 2011 <http://www.greenpeace.org.uk/blog/climate/exposed-edf%E2%80%99s-plan-funnel-%C2%A31bn-nuclear-fund-away-fuel-poor-20110926>

6. Cumbrian Waste Manoeuvres

In NuClear News No.32 we reported on the Committee on Radioactive Waste Management's (CoRWM) expectation that the West Cumbria Managing Radioactive Waste Safely Partnership would run a consultation on its recommendations to the three Cumbrian local authorities from mid November until 20th January 2012.

It's now clear that the Partnership will still be reviewing a draft of the consultation document at its 3rd November meeting in Egremont, so it's quite likely that the consultation will not start before January 2012, although starting at the end of November might still be feasible. The area where there are still disagreements amongst Partnership members appears to be Chapter 10 on "*The Process for Siting a Repository*". The Cumbrian Association of Local Councils (CALC) says the Partnership is still lacking full agreement about what voluntarism means. (1)

Meanwhile a panel made up of representatives from the MRWS partnership is investigating the potential damage to the Lake District and Cumbria brand that might arise as a result of progressing plans for a nuclear waste dump in West Cumbria and is preparing a 'Brand Protection Strategy'. Cumbria Tourism and the Chamber of Commerce have prepared a brief on behalf of the MRWS Partnership and a list of potential consultancies to undertake the work is being drawn up. (2)

Marianne Birkby of Radiation Free Lakeland says both Cumbria Tourism and the Chamber of Commerce which are drawing up the plan have interests in nuclear developments. The chairman of Cumbria Tourism is Eric Robson who is owner of the PR company Osprey Communications which has a lucrative government contract promoting "steps towards geological disposal." The Cumbria Chamber of Commerce is now wholly funded, not as it should be by central government, but by the nuclear and arms industry - Sellafield Ltd and BAE. (3)

Robson is also the chairman of BBC's Gardeners Question Time. Marianne Birkby says he is both poacher and gamekeeper by acting as a PR guru for an organisation which is essentially promoting steps towards geological disposal while holding a position of trust for tourism and the environment. He should step down from Cumbria Tourism." The head of policy at Cumbria Tourism, Richard Greenwood, admitted more nuclear development "*probably is not going to be a benefit.*" (4)

Members of the Partnership visited a research facility in France in October, which is managed by the French nuclear waste management agency, to see the work that is being carried out to look at geological disposal. As part of the trip, Partnership members will visit the Meuse/Haute-Marne underground research laboratory near Bure in France. The facility has been built to test the suitability of the area for a geological disposal facility. The Partnership members will also meet with community leaders, and representatives from Andra – the French national radioactive waste management agency. (5)

Marianne said the Partnership should go for a walk up Scafell instead of spending taxpayer's money on a jolly. A walk up Scafell would give them a sense of the scale of DECC's proposal for a huge hole in the ground. Scafell is a mere 978 meters – the proposal is for the dump to be up to 1000 meters deep. (6)

The submission by the Nuclear Free Local Authorities to the DECC Consultation on “*Managing Radioactive Waste Safely: Desk Based Identification and Assessment of Potential Candidate Sites for Geological Disposal*” is available at:

http://www.nuclearpolicy.info/docs/radwaste/NFLA_RWB_30_deep_waste_options.pdf

- (1) West Cumbria Partnership Meeting 20th September 2011 Minutes
http://www.westcumbriamrws.org.uk/documents/222-Partnership_Meeting_Report_20_Sept_2011.pdf
- (2) Radiation Free Lakeland 20th September 2011
<http://mariannewildart.wordpress.com/2011/09/20/cumbria-branded/>
- (3) Morning Star 23rd September 2011
<http://www.morningstaronline.co.uk/news/content/view/full/109866>
- (4) Guardian 23rd September 2011 <http://www.guardian.co.uk/media/2011/sep/23/gardeners-question-time-conflict-interests>
- (5) Cumbria Crack 29th Sept 2011 <http://www.cumbriacrack.com/2011/09/29/fact-finding-repository-visit-for-west-cumbria-managing-radioactive-waste-safety-partnership-members/>
- (6) 101 uses for nuclear power 3rd Oct 2011 <http://101-uses-for-a-nuclear-power-station.blogspot.com/2011/10/jollies.html>

7. Is the Government Planning to announce Mox2?

Hopes are still high in parts of West Cumbria that Sellafield will get a second Mox plant, following the announcement in August by the Nuclear Decommissioning Authority that the first one is closing down. (1) There were even rumours that an announcement might be made in Parliament in the week beginning 10th October. (2) In the event, that didn't happen. Copeland MP Jamie Reed pressed the case for Mox 2 in a House of Commons debate on 11th October.

Independent scientists have suggested that instead of building an expensive new Mox plant to deal with the UK's embarrassing plutonium stockpile, (3) Sellafield could use its existing plant to make inexpensive, low-grade Mox fuel that could be buried underground rather than being burned in nuclear reactors. But, according to *The Independent* the Government's advisors have said this isn't viable, which leaves them a choice of either encasing the plutonium in ceramic blocks for burial as high-level waste, or gambling on yet another Mox plant costing £3bn to build with lifetime costs nearer £6bn.

The Nuclear Decommissioning Authority, which is in charge of Sellafield, has rejected the disposable Mox option, arguing that the existing Mox plant cannot even make enough low-grade fuel. It also says that the plutonium in disposable Mox could still be used for making weapons. Professor Frank von Hippel of Princeton University, an ex-senior scientific adviser to the White House has criticised the UK's decision to reject disposable Mox as a third option, saying low-grade fuel could be readily manufactured in the existing Sellafield Mox Plant at low cost and with no need to build nuclear reactors specifically to burn Mox fuel.

"It would be interesting to see the analysis by which the DECC has concluded that it would be less costly to build a new £3bn MOX plant than extend the life of the existing Sellafield MOX Plant," he said.

Energy Minister Charles Hendry told Parliament on 11th October: "Were we to proceed down the path of any re-use, any new Mox plant would need to learn from the lessons of the past and take into account the experience from overseas. Additionally, we anticipate that, for security reasons and to minimise the transportation of plutonium, any new Mox facilities might be located as close to the plutonium as possible and most likely in West Cumbria ... The government are in the process of clearing our response through Cabinet and we anticipate being in a position to publish our response shortly".

The Royal Society backed MoX2 in a report entitled "*Fuel Cycle Stewardship in a Nuclear Renaissance*", (4) but it failed to address either the cost or the failures of an existing fuel plant, which had to be closed this year. (5) It says MoX2 is the only way of dealing with the plutonium stockpile at Sellafield. Critics say that the society's inquiry into the nuclear fuel cycle has been heavily influenced by the vested interests of the nuclear industry. One of the experts on the report's working group, Dr Christine Brown, was a key figure at Sellafield when British Nuclear Fuels Ltd (BNFL) was building its Mox plant.

The report highlights a French Mox fuel plant at Marcoule that does perform efficiently, saying Britain could learn much from its design. But the report makes no mention of the problems at a US Mox plant being built at Savannah River in South Carolina, with French help, which is behind schedule and five times over budget.

The Independent's Science Correspondent, Steve Connor, who has followed the MoX issue closely since before the 1999 Sellafield MoX fuel data fabrication scandal, accused the Royal Society of cherry-picking data to suit its hypothesis. There is only a cursory mention (in one sentence) of the technical and economic disaster of the Sellafield Mox plant, which has cost the UK taxpayer £1.3bn to date, with a further bill of some £800m in decommissioning costs. If one of your main recommendations is the building of a second Mox plant at Sellafield, one would have thought some analysis of what went wrong the first time would have been relevant. Equally, there is no mention of the delays and cost overruns of the American Mox plant at Savannah River in South Carolina. Yet the Royal Society says the Melox plant at Marcoule in France could teach us a lesson in how to build a Mox plant that works. Tell that to the Americans. And then there is the strange omission of the "third way" of dealing with Britain's plutonium stockpile – using the existing Sellafield Mox plant to make Mox fuel for disposal, which the Royal Society chose not to mention even though it must have known about it from one of its star witnesses, Professor Frank von Hippel of Princeton University (6)

Rather alarmingly, the Royal Society also advised the government to reconsider its plan to stop its reprocessing activities once existing contracts have been fulfilled. Sellafield's THORP reprocessing plant's lifetime could be extended and investment made to refurbish it, the report said. "*Economic considerations would play an important role in deciding the scale of this investment since a new reprocessing plant may even be necessary,*" it added. Without putting a cost on building a new reprocessing plants, the report said it cost £3 billion to build THORP and the Rokkasho reprocessing plant in Japan cost several times that amount. (7)

- (1) Whitehaven News 13th Oct 2011 <http://www.whitehavennews.co.uk/news/hope-still-high-for-mox-1.887337?referrerPath=news>
- (2) Independent 10th Oct 2011 <http://www.independent.co.uk/news/uk/politics/ministers-gamble-on-new-1636bn-sellafield-plant-2368110.html>
- (3) Independent 10th Oct 2011 <http://www.independent.co.uk/opinion/commentators/steve-connor-can-mox-provide-the-answer-this-time-around-2368109.html>

- (4) Royal Society 13th October 2011 <http://royalsociety.org/policy/projects/nuclear-non-proliferation/report/>
- (5) Independent 13th Oct 2011 <http://www.independent.co.uk/news/science/royal-society-denies-bias-over-sellafield-report-2369716.html>
- (6) Independent 13th Oct 2011 <http://www.independent.co.uk/opinion/commentators/steve-connor-a-flawed-verdict-wilfully-blind-to-key-considerations-2369717.html>
- (7) Reuters 13th Oct 2011 <http://uk.reuters.com/article/2011/10/13/uk-nuclear-britain-idUKTRE79C06Z20111013>

8. Weightman Report

The review of nuclear safety in the UK, launched after the Fukushima disaster in March this year, has found 38 areas where safety could be improved. The review pinpointed critical areas for concern, including risks associated with flooding, the layout of plants, and the state of preparedness for emergencies. Ministers and the relevant regulators will be asked to look at these as a matter of urgency. However, the review also concluded that the UK's nuclear industry is broadly safe, with "*no fundamental safety weaknesses*". If the areas of concern raised in the light of the Fukushima are addressed, the industry will be "*even safer*", the report said. (1)

Independent Nuclear Engineer John Large said the review was a "whitewash". "*I see the hidden hand of the industry being very influential. There is nothing here to counter the gung-ho contention that everything is fine. Everyone acknowledges the severe failures in the way that the Japanese reported Fukushima. If the UK regulators have depended on the Japanese they have not taken good advice.*"

Large questioned why aircraft crashes had not been considered and said that security issues had been glossed over. "*Fukushima was a gift to terrorists. They now know how vulnerable these reactors are. The real gap [in the report] is that UK reactors would not survive more than an hour without power. They have not released the reports done under stress testing. I fear the regulator has just fallen into line with government. This is a 'let's not rock-the-boat response'.*"

Louise Hutchins, energy campaigner at Greenpeace, said: "*This looks like a rushed report, before the full implications are known about Fukushima. It's designed with one objective - to give the green light to a new generation of nuclear power stations, irrespective of the safety, environmental or rising financial costs of those nuclear stations. This is government complacency.*" (2)

The Nuclear Free Local Authorities said the Weightman report was a real missed opportunity which is extremely disappointing. It is already being used and abused as the green light for new nuclear build. Weightman admitted in the foreword that he expressly does not look at the totality of nuclear policy but to narrow technical safety and regulatory issues. So, for example, we don't have any great analysis of the land, airborne or marine pollution issues arising from Fukushima, we don't have any wide-ranging discussion on nuclear security and above all, we have no discussion on the actual ethics of building new nuclear power stations following the worst nuclear disaster since Chernobyl. Dr Weightman is not specifically to blame for this as he can only work in the parameters requested of him by the UK Government. Germany undertook such an exercise and its conclusions led it not just to abandon any consideration of new nuclear build but to start phasing out existing nuclear reactors. What should have happened is a full, open, wide-ranging, transparent and independent public inquiry. The NFLA says it hopes Greenpeace's judicial review will prove that point in the courts.

With 38 serious and concerning recommendations on flooding, emergency planning and the risk assessment model amongst others this is no green light for new build, it is rather an indication that serious work needs to be done across the nuclear sector now and for some years to come. (3)

Louise Hutchins said: "*It's not really clear what Dr Weightman's final report is for. The government already jumped the gun and gave the green light to new reactors in Britain without bothering to wait for Dr Weightman's final conclusions on lessons from the Fukushima disaster. The rushed timetable*

set for this final report looks like a dangerous attempt by the government to cut corners ... That's why we are taking the government to court – to make them wait for the evidence, properly consult and to think again about new nuclear power, like Germany, instead of closing ranks again with the nuclear industry." (4)

- (1) Guardian 11th October 2011 <http://www.guardian.co.uk/environment/2011/oct/11/nuclear-industry-review-uk>
- (2) Greenpeace Press Release 11th Oct 2011 <http://www.greenpeace.org.uk/media/press-releases/weightman-report-rushed-job-lessons-are-learned-fukushima-20111011>
- (3) NFLA Press Release 11th Oct 2011 http://www.nuclearpolicy.info/docs/news/NFLA_response_to_Weightman_final_report.pdf
- (4) Greenpeace Press Release 10th Oct 2011 <http://www.greenpeace.org.uk/media/press-releases/advance-weightman-report-implications-fukushima-disaster-20111010>

9. Hinkley Application

Although the publication of the Weightman Report was announced via a written statement from Chris Huhne on 11th October, anti-nuclear Labour MP Paul Flynn secured an 'urgent question' about it in the Commons. During the debate, Chris Huhne said that "*I understand that, either today or yesterday, planning permission was requested for the first new reactor at Hinkley Point, which is due to be completed at the end of the decade.*"

On the other hand, energy minister Charles Hendry who participated in the adjournment debate on MoX2, also on the 11th said "*Investors know that EDF Energy will begin preliminary works at Hinkley Point soon and is preparing its planning application as we speak to put to the Infrastructure Planning Commission this autumn.*"

Tessa Munt, Conservative MP for Wells in Somerset, near the site of Hinkley Point, noted that there had been a tsunami in Somerset before, albeit in 1607. She said that she understood that the Hinkley Point application amounted to 95,000 pages with a further 50,000 pages of supporting documentation. Planning Act blogger Angus Walker said on 12th October that he has had confirmation from the IPC that they have not yet received an application, but Chris Huhne's remarks must surely indicate that it is imminent. EDF say they are making it 'shortly'. (2)

Meanwhile the Environment Agency which is consulting on two environmental permit applications received from EDF Energy's new nuclear build company, NNB Generation Company Limited (NNB GenCo) relating to operation of a nuclear power station at their Hinkley Point site has decided to extend the deadline for comments by two months to 15th December 2011. (3)

Protesters who blockaded Hinkley Point on 3rd October have said their actions were a "phenomenal success" in shedding light on opposition to new nuclear reactors. Members of several anti-nuclear groups who are part of the Stop New Nuclear alliance barred access to Hinkley Point power station in Somerset in protest against EDF Energy's plans to renew the site with two new reactors. (4) Yannick Rousselet from Greenpeace France warned that jobs at Hinkley Point would either be non-existent or 'from the bottom of the barrel.' He said the work situation at EDF Energy's prototype EPR reactor at Flamanville in northern France was 'shameful.' He added that far from the secure, long-term jobs that local people had been promised, unemployment had risen in the area since construction began. He said that two people had already died during construction and that most of the labour had come from outside the region. (5)

- (1) Burnham-on-sea.com 12th Oct 2011 <http://www.burnham-on-sea.com/news/2011/hinkley-application-12-10-11.php>
- (2) Bircham, Dyson Bell 12th Oct 2011 <http://www.bdb-law.co.uk/blog/anguswalker/284-huhne-says-hinkley-point-application-made-final-weightman-report-debate>
- (3) Environment Agency 4th October 2011 <http://www.environment-agency.gov.uk/homeandleisure/127159.aspx>

- (4) Western Morning News 4th Oct 2011 <http://www.thisisdevon.co.uk/story-13471818-detail/story.html>
(5) Stop New Nuclear 2nd October 2011 <http://stopnewnuclear.org.uk/node/174>

10. The Great Thorium Distraction

Former Friends of the Earth Climate Campaigner and now Labour peer, Bryony Worthington has been pushing Thorium reactors as the latest solution to climate change and was instrumental in launching the Weinberg Foundation in September "*to drive awareness, research and commercialisation of cleaner and safer nuclear technologies, fuelled by thorium.*" (1)

The idea is to create a new generation of nuclear reactors based on the element thorium, as opposed to uranium. Thorium, its advocates claim, is beneficial not only because it's far more abundant and widely distributed in the Earth's crust than uranium; in addition, liquid-fluoride thorium reactors (LFTRs) could theoretically be much smaller, much cheaper and much safer than conventional nuclear reactors. The waste they produce would remain dangerous for a far shorter period and, crucially, couldn't be used to create nuclear weapons.

According to *The Guardian* Craig Bennett, policy and campaigns director of Friends of the Earth, says he supports thorium research but believes that "*thorium nuclear reactors aren't going to be ready in time* [to avoid dangerous climate change]."

The pro-thorium lobby claim a single tonne of thorium burned in a molten salt reactor (MSR) – typically a liquid fluoride thorium reactor (LFTR) – which has liquid rather than solid fuel, can produce one gigawatt of electricity. A traditional pressurised water reactor (PWR) would need to burn 250 tonnes of uranium to produce the same amount of energy. They also produce less waste, have no weapons-grade by-products, can consume legacy plutonium stockpiles and are meltdown-proof – if the hype is to be believed. (2)

The significant sticking point to the promotion of thorium as the 'great green hope' of clean energy production is that it remains unproven on a commercial scale. While it has been around since the 1950s (and an experimental 10MW LFTR did run for five years during the 1960s at Oak Ridge National Laboratory in the US, though using uranium and plutonium as fuel) it is still a next generation nuclear technology – theoretical.

China did announce this year that it intended to develop a thorium MSR, but nuclear radiologist Peter Karamoskos, of the International Campaign to Abolish Nuclear Weapons (ICAN), says the world shouldn't hold its breath.

'Without exception, [thorium reactors] have never been commercially viable, nor do any of the intended new designs even remotely seem to be viable. Like all nuclear power production they rely on extensive taxpayer subsidies; the only difference is that with thorium and other breeder reactors these are of an order of magnitude greater, which is why no government has ever continued their funding.'

The nuclear industry itself is also sceptical, with none of the big players backing what should be – in PR terms and in a post-Fukushima world – its radioactive holy grail: safe reactors producing more energy for less and cheaper fuel. In fact, a 2010 National Nuclear Laboratory (NNL) report concluded the thorium fuel cycle 'does not currently have a role to play in the UK context [and] is likely to have only a limited role internationally for some years ahead' – in short, it concluded, the claims for thorium were 'overstated'. (3) Proponents counter that the NNL paper fails to address the question of MSR technology, evidence of its bias towards an industry wedded to PWRs.

But even were its commercial viability established, thorium is one magic bullet that is years off target. Those who support renewables say they will have come so far in cost and efficiency terms by the time thorium technology is perfected and upscaled that thorium reactors will already be uneconomic.

Indeed, if renewables had a fraction of nuclear's current subsidies they could already be light years ahead.

Oliver Tickell, author of *Kyoto2*, says the fission materials produced from thorium are of a different spectrum to those from uranium-235, but “*include many dangerous-to-health alpha and beta emitters*”. Thorium reactors will create new radioactive waste, on top of the legacy waste we already have to deal with.

Putative waste benefits – such as the impressive claims made by former Nasa scientist Kirk Sorensen, one of thorium's staunchest advocates – have the potential to be outweighed by a proliferating number of MSRs. The by-products of thousands of smaller, ostensibly less wasteful reactors would soon add up.

Thorium cannot in itself power a reactor; unlike natural uranium, it does not contain enough fissile material to initiate a nuclear chain reaction. As a result it must first be bombarded with neutrons to produce the highly radioactive isotope uranium-233 – so these are really U-233 reactors. This isotope is more hazardous than the U-235 used in conventional reactors because it produces U-232 as a side effect (half life: 160,000 years), on top of familiar fission by-products such as technetium-99 (half life: up to 300,000 years) and iodine-129 (half life: 15.7 million years). Add in actinides such as protactinium-231 (half life: 33,000 years) and it soon becomes apparent that thorium's superficial cleanliness will still depend on digging some pretty deep holes to bury the highly radioactive waste.

Jean McSorley, senior consultant for Greenpeace's nuclear campaign, the pressing issue is to reduce energy demand and implement a major renewables programme in the UK and internationally – after all, even conventional nuclear reactors will not deliver what the world needs in terms of safe, affordable electricity, let alone a whole raft of new ones.

‘Even if thorium technology does progress to the point where it might be commercially viable, it will face the same problems as conventional nuclear: it is not renewable or sustainable and cannot effectively connect to smart grids. The technology is not tried and tested, and none of the main players is interested. Thorium reactors are no more than a distraction.’

Bryony's response is that if the UK is serious about pursuing nuclear power, and it appears that it is, then we must include the pursuit of thorium power in this endeavour. (4)

See also *Thorium Fuel: No Panacea for Nuclear Power* by Arjun Makhijani and Michelle Boyd.

<http://www.ieer.org/factsheet/thorium2009factsheet.pdf>

And *Thorium Reactors: Back to the dream factory*, by Gordon Edwards,

http://www.ccnr.org/Thorium_Reactors.html

- (1) Guardian 9th September 2011 <http://www.guardian.co.uk/environment/blog/2011/sep/09/thorium-weinberg-foundation>
- (2) Guardian 23rd June 2011 (reprinted from Ecologist)
<http://www.guardian.co.uk/environment/2011/jun/23/thorium-nuclear-uranium>
http://www.theecologist.org/News/news_analysis/952238/dont_believe_the_spin_on_thorium_being_a_greener_nuclear_option.html
- (3) *The Thorium Fuel Cycle*, NNL, August 2010
http://ripasetsesu.s3.amazonaws.com/www.nnl.co.uk/_files/documents/aug_11/NNL__1314092891_Thorium_Cycle_Position_Paper.pdf
- (4) Ecologist 1st July 2011
http://www.theecologist.org/blogs_and_comments/commentators/other_comments/962512/response_dont_dismiss_the_potential_of_thorium_nuclear_power.html