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1. Hinkley Point C – the last days?

There is a growing chorus of critics calling for Hinkley Point C to be scrapped altogether, according to the *Sunday Times*. (1) It would be one of the most expensive man-made objects ever built in the world. At a cost of £24.5bn it would tie British households into paying for astonishingly expensive electricity subsidies until 2060. The world has changed since 2010 when Hinkley was first named as a site for new reactors. The price of renewables has plummeted.

Peter Atherton, an analyst at Jefferies and long-time critic is unequivocal: *“This project is an abomination,” he said. “It’s going to cost £16bn to build, plus another £6bn in financing costs. Either of those numbers alone should have made this unthinkable. We’re building a power station, not the pyramids.”*

Since 2010 the cost of solar power panels has plummeted by 67%, according to *Bloomberg New Energy Finance*. The price of onshore wind turbines has shrunk by 5%, though the government’s decision to slash subsidies will curtail new developments.

Vincent de Rivaz, Chief Executive of EDF Energy responded by saying that *“imagined cheaper alternatives ... do not exist ... wind and solar power will play an important part in our energy mix, but they cannot provide a reliable energy supply all day and all year round.”* (2)

But as we learnt in NuClear News No.73 the very concept of baseload electricity is outmoded. What a low carbon sustainable energy system needs is not baseload but flexible back-up which can be turned on and off quickly to provide electricity at peak times when renewables are not producing much. Otherwise so-called baseload electricity will constrain the expansion of renewables and mean that clean electricity goes to waste when renewables are working well. There are at least six things we can do to help a renewable dominated system operate without baseload:-

- By using the right mix of renewables intermittency can be reduced;
- By increasing grid connections to other countries so that electricity can be imported at peak times when indigenous renewable production is low, and so that surpluses can be exported.
- By storing surplus renewable electricity which can be called upon when wind and solar production is low.
- Demand management – using various techniques to reduce demand at peak times.
- By calling on combined heat and power stations working in conjunction with heat storage to generate electricity at peak times.
- By using surplus renewable electricity to generate heat which can be stored for later use.

The UK Government is now said to be deeply concerned about the future of the Hinkley project following revelations about problems at the similar reactor being built at Flamanville in



Normandy. Construction of the Flamanville reactor began in December 2007, with the date for completion repeatedly pushed back from an initial goal of 2012. The most recent completion date is 2017, while the cost has more than doubled from €3.3 billion to €8.5 billion. (3)

In April it was revealed that anomalies had been found in the bottom and lid of the reactor pressure vessel (RPVs) which means weaknesses in the vital metal structure protecting the outside world from the highly radioactive reactor core. (4) Pierre-Franck Chevet, head of France's nuclear safety inspectorate revealed that the same manufacturing technique was used in the steel for the identical safety casings destined for Hinkley Point, which "*have already been manufactured*". (5)

The 110-ton spherical steel lid which was destined to sit on top of the Hinkley Point RPV is now going to be sacrificed to test the strength of a part already welded in place at similar atomic projects in France and China. (6) The tests are vital after potential weaknesses were found in the steel used to contain radiation. The issues were found in the head and base of the container for the reactor core built at Areva's Creusot Forge in eastern France. If further tests prove they aren't strong enough, the equipment can't be used, said Pierre-Franck Chevet. Countries, such as the UK who have taken a gamble on the technology being a key element in their energy policies, will need to improvise if testing confirms flawed design. If testing results in component replacement, this would be very expensive and time consuming especially if it implies similar actions for other projects. (7)

In June a leaked report from France's nuclear safety watchdog highlighted faults in Flamanville's cooling system. According to the *Daily Telegraph* the fault would expose the reactor to the risk of a meltdown. (8) EDF's problems in France have prompted worries at a senior level of the Treasury about Hinkley, according to the *Financial Times* "*I think there are serious questions about the technology,*" said one Treasury figure. "*Only if that can be fixed is there a desire to go ahead with it... on balance.*" Senior officials have discussed whether to "*start from scratch*" with a different, more established reactor technology from elsewhere.

Talks between the government, EDF and its two Chinese partners over a final financing package were supposed to be completed by March but have dragged on. Now officials and executives are working towards a fresh deadline of October, when China's President Xi Jinping has a state visit to Britain.

There are growing suspicions in Westminster and within the industry that the Treasury has been dragging its heels over supporting the project. One source close to EDF said he believed there had been "*briefings from people at the Treasury*" against the deal. Some civil servants believe the government struck an overgenerous "*strike price*" to buy energy from Hinkley's two reactors for 35 years. "*I think Treasury officials would not be disappointed if Hinkley never happened,*" said one Whitehall source. "*They have been foot-dragging for at least a year.*" One Tory figure said: "*I think the Treasury don't really want that deal to work.*"

Meanwhile even the Labour Party appears to have withdrawn its unequivocal support for the project. Jonathan Reynolds, shadow climate change minister, has written to Amber Rudd, the new energy secretary saying: "*I am asking you today to admit the project will not proceed and inform parliament what your alternative energy strategy will be.*" (9)

The new SNP spokesperson for Energy and Climate Change, Callum McCaig MP said:



“The financial crisis surrounding the future of the Hinkley Point C nuclear plant demonstrates yet again the folly of the UK government’s decision to spend huge amounts of public money to subsidise new nuclear power stations. Despite the mounting evidence that it is hugely expensive with other stations going vastly over budget and being years behind schedule, the UK government are determined to continue to throw billions of pounds into promoting new nuclear. By diverting money away from renewables to new nuclear the UK Government’s plans are also damaging the renewables sector. Hinkley is a bad deal that will push up bills and cost the taxpayers a fortune for many, many years to come. “Scotland neither needs nor wants new nuclear. We have huge potential in renewables that can generate clean green energy for the future.” (10)

Stop Hinkley spokesperson, Roy Pumfrey, said:

“The Government can’t continue to pretend that Hinkley will go ahead. It is high time that the threat of this massive disruption to Somerset was removed permanently and we were allowed to get on with planning for the renewable future that we so desperately need”. (11)

Newport West Labour MP Paul Flynn writing ahead of a Westminster Hall debate on new nuclear power called Hinkley a “*financial basket case*”. It has been an odyssey of failure, delay and mounting costs. A positive image has been created by a rich skilful lobby that has manipulated gullible public opinion. Other nations who were not protected from the awful £250bn truth of Fukushima have abandoned nuclear power. Germany is one that has transformed their future energy plans into renewables solutions. In denial the UK stumbles on. Europe’s catastrophic delays in two similar stations are ignored even though their problems are likely to be repeated here. Finland's Olkiluoto was due to generate electricity in 2009. The latest of many promised finish dates is 2018. Cost overruns stand at €4 billion. (12)

Nuclear needs a blank cheque

Now that it is plain that nuclear power has failed miserably to compete with renewable energy even on the somewhat skewed playing field represented by the (proposed) Hinkley C deal, nuclear supporters are trying to engineer a 'blank cheque' to be given to nuclear developers, according to Dr Dave Toke. (13) The Institute for Public Policy Research (IPPR) says that, although it doesn’t believe the Government’s nuclear programme is feasible because of the costs involved, if new nuclear power projects are to continue to be supported, beyond the Hinkley Point C project, the government should use different financing arrangements that would provide better value for money for the British public. (14)

The IPPR favour developing nuclear power as a publicly owned development, on the same basis as projects like HS2. There would be a 'cost plus' contract given to the nuclear power developers, who could, and no doubt would, be able to waste taxpayers money on a grand scale without any risk to their own profit margins. The fact that that nuclear power is so uncompetitive that it needs this sort of treatment should lead us to the conclusion that it is much better to spend the money on something else, renewable energy for example, of which there is no shortage.

IPPR is close to the Labour Party, says Toke. It would be rather unfortunate if the Labour Party supported the IPPR's approach and came out as being, in effect, more pro-nuclear than the Conservatives if it adopted a 'blank cheque' approach. Jonathan Reynolds, Labour's energy spokesperson has indeed backed the report with a twitter message.



Sizewell C

EDF Energy says it will not go on to the second stage consultation on its planned Sizewell C reactors until it knows how it is going to pay for Hinkley. (15) The second stage consultation is expected to give final details of issues such as road improvements, worker accommodation and park-and-ride sites. Recent uncertainty over progress turned into frustration earlier in the year when it became clear that the next formal stage of consultation on the project would not take place until after the election. EDF said “...all things come through Hinkley Point. We very much hope that remaining issues around financing and infrastructure are resolved in the coming months, and that we are able to take matters forward with more pace here at Sizewell.” (16)

Andrea Leadsom, Minister of State for Energy and Climate Change in a rather delusional statement to the House of Commons, insisted that the Government still supports the expansion of nuclear generation and expects to be able to meet 35% of UK power needs from nuclear by 2028 with around 16GW of new capacity. That's 2 new EPR-sized reactors every year from 2023. (17)

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2. French Nuclear Industry

The deep crisis which the French nuclear industry is experiencing is not new, although it seems to have shocked some commentators. It actually represents the outcome of a strategy launched at the end of the 1990s which was always flawed. The project involved an aggressive export policy which it was hoped would disguise predictable difficulties at home, according to a report by WISE Paris for Greenpeace. (1)

Faced with declining overseas markets and increasing expenditure at a domestic level, EDF and Areva appear to be heading for a terminal decline. The recent industrial *restructuring* will not save the industry. Only a genuine *reorientation* can prevent further disaster for the French economy.

Areva has now suffered four years of losses, including a record figure of €4.8 billion in 2014 and debts of €5.8 billion against a turnover of €8.3 billion. The group is facing bankruptcy and cannot sidestep a far-reaching redistribution of its business operations. Despite less worrying results, the EDF group, whose fifty-eight nuclear reactors operated in France provide more than 75% of the country's electricity, is also experiencing difficulties. Boosted by its turnover of €72.9 billion, the electricity company recorded net profits of €3.7 billion in 2014. But its debt situation – now at €34.2 billion - is increasingly a matter of concern.

In the era of the energy transition, in which France has set itself the objective of lowering the share of nuclear power in its electricity generation to 50% by 2025, the future looks grim for the two companies.

With 8 GW of wind power and 5 GW of solar power installed between 2000 and 2013, France has developed these energy sources 2.5 times slower than the European average. France has only been able to sell three reactors abroad in the last eight years – one to Finland and two to China. But while France is providing political support to domestic and exported nuclear power, it is also neglecting its renewable energy industry. As a result, it is lagging far behind in international competition in this field, particularly in the two sectors currently experiencing massive growth, namely wind and solar power.

Out of the thirty-one countries operating nuclear power plants, twenty-five have never used or have ceased to use reprocessing. The La Hague plant has lost practically all of its foreign clients over the last decade, with the exception of the Dutch operator, which has only one reactor: it therefore only provides reprocessing service to 0.2% of installed nuclear capacity abroad. Areva holds almost around 90% of this global market, but currently the market consists almost solely of EDF.

The acquisitions of Constellation Energy in the USA by EDF and of Uramin by Areva cost them losses of at least €2.7 billion and €1.5 billion respectively, while the additional costs and delays of the Finnish EPR account for at least €3 billion more in Areva's losses. Alone, these three items represent more than €0.5 billion in losses per year averaged out over the last ten years.

Burdened by losses, EDF's foreign activities are currently unable to finance the increasing requirements at home, where the production costs of nuclear plants are rising by around 5% each year and investment needs are increasing. Lifetime extensions at nuclear plants which



Are on average more than thirty years old, could cost at least €110 billion. EDF does not seem to have the financial and industrial capacity today to successfully extend the life of all its reactors.

Areva has even less solid foundations than EDF. The Okiluoto fiasco with costs currently estimated at €8.5 billion as against the €3.3 billion initially projected and delays of more than nine years, significantly reduces prospects for new exports. Areva also suffered a great failure with the construction of a MOX plant at Savannah River in the USA, which has more than fifteen years of delays and soaring costs, to the extent that the project is all but shelved today.

The situation calls for not simply restructuring but a totally new direction. If the fundamental principles that have precipitated the French nuclear industry into its current crisis are not acknowledged, much effort and public money will be invested in an approach which is doomed to fail. The international trend is not for a nuclear renaissance but for a boom in renewable energy, and France will not be able to export significantly more reactors, or to develop new reprocessing contracts abroad under profitable conditions. The future of the French nuclear industry must urgently shift its focus to the maintenance of current reactors and decommissioning and nuclear waste management services.

To understand just how far the French nuclear industry has fallen in recent years, look no further than the value of EDF and Areva. Since 2007, EDF's stock price has fallen more than 70%; Areva's by more than 85%. If Areva weren't 83% government-owned, it almost certainly would have declared bankruptcy by now. EDF's problems, although not as severe as Areva's—mostly because it is much larger and as the main electric utility in France at least has cash flow—may be structurally even greater. The basic problem is that EDF can no longer sell electricity for as much as its aging fleet of reactors cost to generate that electricity. EDF's operating and maintenance costs for its reactors are increasing at about 5% per year—but its electricity rates aren't. Nor can it easily raise its rates: there are legal issues involved for its regulated business and if it raises rates in its deregulated markets it won't be able to compete. (2)

A new report by ADEME, a French government agency under the Ministries of Ecology and Research, concludes that a 100% renewable electricity supply scenario is feasible in France. The report estimates that the electricity production cost would be €119 per megawatt-hour in 2050 in the all-renewables scenario, compared with a near-identical figure of €117 / MWh with a mix of 50% nuclear, 40% renewables, and 10% fossil fuels. (3)

The EPR saga shows that even countries with extensive nuclear expertise and experience can mess things up. The EPR might have demonstrated the potential for mass production to drive down costs - but in reality it is demonstrating the opposite. Even before the EPR fiasco, the large-scale, standardised French nuclear power program was subject to a negative economic learning curve - costs were increasing over time. The EPR represents a negative learning curve on steroids.

France has now decided to rescue Areva yet again - this time by combining the nuclear power station construction business with state-controlled power operator EDF, its biggest client. Only a few years back, in 2010, Areva's finances had been restored by the forced sale of its transport and transmission activities to industrial group Alstom and electrical engineer Schneider.

The rest of Areva includes uranium mines, nuclear waste recycling, transport, storage and some alternative energy activities. For all intents and purposes, Areva is dead. External factors may



have precipitated the crash of Areva, but the cause is internal. Areva and the French nuclear industry is controlled by engineers and state officials and the market comes as an afterthought. The problems of time and cost overruns in China, Finland and now in France at Flamanville are self-made and part of the "esprit de corps" arrogant attitude of the organisation, says Forbes magazine. (4)

Suffering from the same delusions as the UK Government, the French Government said "*This merger will allow for an ambitious export policy and the future renewal of France's nuclear power plants.*" (5)

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3. Levy Control Framework

In NuClear News No.74 May 2015 we reported on a new report from the Policy Exchange think-tank which said that the Levy Control Framework budget may already be exhausted. The £7.6bn budget that is meant to provide subsidies for renewable energy schemes through to 2020/1 using money raised from consumers' bills may already have been allocated. A host of large renewable energy projects already in the pipeline may have to be abandoned unless more money is provided. (1)

On 18 June, DECC announced its intention to end new public subsidies for onshore wind farms by legislating to close the Renewables Obligation (RO) to projects one year earlier than planned --from 1 April 2016. This news came as no great surprise; the Conservatives' General Election manifesto had clearly signalled the party's intention to obstruct the deployment of onshore wind if elected.

Cornwall Energy suggests there is more than a phobia of onshore wind behind these plans, just as there was for the previous move against solar. Policy Exchange is due shortly to release further work on the LCF shortly and Cornwall Energy's own analysis suggests that the numbers will make even more uncomfortable reading for the government.

Budgets are much tighter than previously expected, because DECC has underestimated the cost of nearly all of the schemes under the LCF umbrella. The small-scale feed-in-tariff (FiT) has seen a notable rise in solar photovoltaics (PV) and onshore wind coming online, while the RO has seen a surge of ground-mounted large-scale solar to complete ahead of its close-out in April 2015. Indeed, the growth of solar capacity continues to amaze - 2.53GW of new solar capacity was connected to the UK grid in the first quarter of 2015--more than was installed in all of 2014 and with more to come squeezing in through the application of grace periods. It is estimated that the UK now has a total installed solar PV capacity of over 8GW.

Cornwall Energy says it has been calculating the remaining money left in the LCF. Based on projections of continuing spend under the RO and small-scale FiT the consultancy has come to the conclusion that there might not be any money left to spend. (2)

Offshore wind capacity is also likely to continue to increase with a number of developers intending to complete sizeable installations prior to the end of the RO in 2017, and the new Conservative government is a huge proponent of offshore wind. DECC is, therefore, likely to have to remove budgetary support from other technologies, such as solar, in order to secure future CfD funding for offshore wind - particularly if the Swansea Bay tidal lagoon comes onstream in 2018 as has been suggested. (3)

Of course this spending crisis is one that is manufactured by the Treasury itself. The Treasury decided not to increase the 'carbon levy' on fossil fuel prices last year, thus meaning that its own budget for renewable energy incentives would not support as much renewable energy. In addition to this wholesale power prices have fallen, again meaning that a given amount of incentives will develop less renewable energy. It seems that not only will funding for onshore wind and solar farms be ended, but it is likely also we will hear announcements soon about the tailing off of support for small renewables in the feed-in tariff including domestic solar pv. One



or two token offshore windfarms may be left in the offing if they can achieve much reduced prices.

Dave Toke, Reader in Energy Policy at Aberdeen University says “*You would think that the Treasury, cognisant of the fact that energy prices will be much lower anyway, would increase the amount budgeted in the LCF. But no. Rather the Treasury appear to be using the situation to cut back on renewable energy. The Department of Energy and Climate Change is reduced to being little more than a public relations cover for all this in the process. The UK will fall a long way short of its EU target of supplying 15 per cent of its energy through renewables by 2020.*” (4)

Climate Change Committee

In its latest progress report, the Committee on Climate Change (CCC) delivers its verdict on how effective government policy has been in achieving the UK's legislated climate targets.

The CCC argues that a whole host of low carbon support schemes end at the end of the decade, with little visibility for investors beyond 2020. One of these is the Levy Control Framework, which finishes in 2021, while the Renewable Heat Incentive and the Energy Company Obligation (ECO) energy efficiency scheme close even sooner.

How, the CCC asks, can investors and project developers plan ahead to deliver the low carbon infrastructure the UK needs if they have no idea what kind of returns they will be seeing? It recommends extending these programmes into the coming decade to match project timelines, and in the case of the LCF, increasing funding to a peak of around £9bn by 2025 to bring forward more expensive technologies such as offshore wind and carbon capture and storage. As well as bringing forward green energy technologies cost-effectively, the CCC says extending funding will also ensure the UK does not lose out on investment to other countries. Extending the LCF is seen as one of the most urgent challenges facing the government and must be done in the next year if the government is to keep to its promise of decarbonising the economy in the most cost-effective way possible.

Lord Deben also said that if the government chooses to try meeting targets without onshore wind, it must be prepared to explain why it is taking a more expensive route towards decarbonisation. (5)

As Tom Burke points out, in the current state of the public finances only an optimist would assume that the LCF will rise much above the current level in 2021. And the fatal flaw with the LCF policy is clearly revealed by the proposed agreement with EDF to build a £24bn nuclear power station at Hinkley Point. To go ahead EDF needs an index-linked guarantee of twice today's wholesale price of electricity for the next thirty five years. This will cost about £1.2bn per year. (6)

Given there's only so much money to go round, if nuclear power is allowed to grab the lion's share of any new money this will seriously diminish the funds available to develop the renewable energy revolution. An analysis by Dave Toke, suggests that spending on Hinkley Point C and later nuclear reactors will obliterate spending on renewables.

So, if the LCF is increased to around £9bn subsidies to Hinkley could be using up all the extra by 2023. And by the time further money becomes available for subsidies in say 2027, Sizewell C



could be ready to start gobbling up subsidy money. (7) And, as we have seen, the Government intends to have 16GW of new nuclear up and running by 2028.

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4. Solar Independence Plan for Britain

As Britain enjoys a bout of summer sun, with solar expected to provide 15% of electricity (1) on the afternoon of 3rd July (2), the Solar Trade Association's (STA) is promoting its '*Solar Independence Plan for Britain*', (3) which sets out how the government could implement a plan to install up to 25GW of solar in the UK by 2020 – up from an expected 10GW in 2016. (4)

Solar power has seen spectacular growth in Britain and around the world over the last five years. From a negligible level at the time of the last General Election in 2010, solar now provides 1.5% of the UK's electricity, supporting over 30,000 jobs across the country (including the supply chain). Prices have tumbled rapidly, allowing the Government to cut subsidies by about two-thirds during the lifetime of the last Parliament. Solar power continues to be hugely popular, with over 80% of the public supporting it in repeated surveys.

Strong political support would provide market confidence, leading to stability, further cost reductions, cheaper cost of capital and the ability to drive solar towards zero subsidy. What the industry needs is one final push from government to get it there. The result would be a healthy, thriving industry that will provide clean solar electricity without public support and deliver export opportunities for UK companies.

Simple adjustments to existing policies would potentially enable the UK to deliver nearly twice as much solar capacity as current policies and spending commitments will allow, and usher in an era free from subsidies. The Plan presents two fully-costed scenarios that deliver considerably more capacity at much lower overall per-unit cost. The 'Minimum Ambition' scenario could deliver 20 gigawatts (GW) by 2020 for an investment just 17% higher than we estimate the 12GW upper range of DECC's PV Strategy will cost. The 20GW scenario costs £1.4bn in 2020, just £200m more than DECC's 12GW, but delivers an additional 8GW of capacity and many more solar jobs in 2020 (40,200 jobs).

The 'Higher Ambition' scenario could deliver 25GW of solar in 2020 for a cost of £1.55bn – a further increase of only £150m over the 'Minimum Ambition' scenario but for an additional 5GW of capacity. This 'Higher Ambition' allows the delivery of more than two million solar homes by 2020, 24,000 commercial rooftop and community schemes, and around 2,000 solar farms. It provides 56,900 jobs in 2020. The estimated cost on bills is £13.35/yr in 2020.

There is additional potential for growth if the Government reinstates a meaningful Zero Carbon Homes agenda to incentivise the uptake of solar on new build. Two hundred thousand new solar-equipped homes per year could add up to a further 3GW of capacity by 2020.

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5. FoE's Priorities

There was disquiet in May when Friends of the Earth (England, Wales and Northern Ireland) failed to include opposition to nuclear power in its list of ten priorities for Amber Rudd - the Government's new Secretary of State for Climate and Energy. (1) The list was:

- Show leadership going into the Paris climate talks
- Energy efficiency – warm homes for everyone
- Help Solar keep growing
- Wind – both on and offshore
- Energy owned by people
- No cash to high-carbon biomass
- Moratorium on Fracking
- No new dash for gas
- Phase-out coal
- Build strong bridges with DfT, DEFRA and the Treasury

The former director of Friends of the Earth (FoE), Sir Jonathon Porritt, called the failure to make opposition to new nuclear power stations a priority “*truly reprehensible*”.

Dave Toke, Reader in Energy Policy at Aberdeen University explained that the very fact that the Treasury caps spending on ‘low carbon’ energy spending means that as money is pencilled in for notional (fantasy) nuclear power, less will be available for renewable energy. Of course a key priority at the moment is to ensure that the Treasury and DECC release more funds under their Levy Control Framework (LCF) policy to enable implementation of renewable energy targets for 2020, including, of course, for onshore wind. But it would be a grave mistake to believe that what is being decided now and in the next couple of years will not set the agenda for the early 2020s. The Climate Change Committee (CCC), for example, is now deliberating on its fifth carbon budget to cover the period starting 2028. We must act now to safeguard not only the present, but also the future.

He called on FoE to put demands for the scrapping of Hinkley C to the Government, accompanied by demands for a post-2020 system of effective long term power purchase agreements for renewable energy technologies. These must include onshore and offshore wind and solar pv (both ground mounted and on rooftops). The CCC also needs to be persuaded to shift emphasis from what is obviously a failing nuclear strategy and towards other, genuinely green, energy technologies. (3)

Porritt says the naivety in Friends of the Earth's overall positioning is deeply troubling because the Government's continuing support for a 'nuclear renaissance' in the UK is now the *single biggest barrier* to the UK developing the kind of coherent, sustainable energy strategy that FoE



subscribes to. The entire policy-making process has been hijacked by Ministers' obsession with nuclear power, and were any new nuclear to go ahead, it would lock us into hugely inefficient and unwieldy generation and distribution systems, essentially eliminating prospects for a radically different, distributed energy system.

In effect, DECC has already become the Department for Nuclear Power and Nuclear Legacy, with at least 90% of its (already very small) budget of around £8bn dedicated to cleaning up the UK's nuclear legacy, particularly at Sellafield. Much of this spend is non-negotiable, so further cuts (which now look inevitable) will fall on everything else - including renewables and energy efficiency.

As the Government's pro-nuclear position has become more and more extreme, it's having a more and more disturbing impact on energy policy in general. The renewables sector has already taken a massive hit because of the preferencing of nuclear, and energy efficiency barely gets a look-in when it comes to thinking strategically about our energy infrastructure.

As both Friends of the Earth and Greenpeace stay in the background on nuclear issues, largely invisible and mostly silent, more and more people are gulled into thinking that nuclear really does have some part to play in securing our low-carbon energy future - not just in the UK but around the world.

Friends of the Earth further justifies its position, when challenged, by arguing that Hinkley Point is more than likely to fail anyway, primarily for financial reasons, so why bother to campaign against something that's as good as dead in the water anyway? Porritt says he too believes that Hinkley Point will never happen - which is precisely why he believes it's more important than ever to be ramping up the pressure, not withdrawing even further into the background. (4)

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1. FoE 14th May 2015 <http://www.foe.co.uk/blog/lights-are-amber-will-they-go-green>
 2. Independent 24th May 2015 <http://www.independent.co.uk/environment/friends-of-the-earth-slammed-as-totally-reprehensible-by-groups-former-director-10272276.html>
 3. Dave Toke's Blog 22nd May 2015 <http://realfeed-intariffs.blogspot.co.uk/2015/05/why-foe-should-demand-now-that.html>
 4. Ecologist 9th June 2015 http://www.theecologist.org/blogs_and_comments/commentators/2900279/friends_of_the_earth_must_come_out_fighting_on_nuclear.html

6. Labour's Priorities

Last March Geneticist Dr Becky Martin wrote an Open Letter to Baroness Worthington about her support for nuclear power after she championed the removal of local authority's right to decide over the disposal of nuclear waste in their communities in the House of Lords. Dr Martin argued that nuclear power is not a low carbon energy source - the average carbon footprint of nuclear power is 66 gCO₂/kWh, breaching the Committee on Climate Change's recommended limits after 2030 of 50 gCO₂/kWh (and compared with 34 gCO₂/kWh for wind power) And as ever lower quality of uranium ore is mined, the energy required to extract the uranium, and the carbon price tag will increase.

She continues: "The amount of subsidies the government wishes to funnel into the greedy jaws of nuclear power is quite frightening, locking us into ridiculous contracts for decades and guaranteeing fuel poverty in the future. Who knows what the energy market will look like in ten, twenty years? Yet energy consumers may be having to pay inflation-proofed subsidies for Hinkley Point C - if it's ever built - to 2060 and beyond! If renewable technology received the proper support - and that includes people like you ceasing to defend the nuclear industry that is threatening to grab almost all the UK's 'low carbon' energy funding - we could be online to meet our carbon targets." (1)

Worthington responded in June saying that climate change is the pre-eminent threat facing our society and she has changed her position on nuclear power having concluded that much of the opposition to it is not based on science and the economics can and will be improved over time. Faced with the task of decarbonising our electricity supply, it would be foolish to rule nuclear power out of the mix. She says the 50g/kWh target for the carbon intensity of electricity in 2030 is a yearly average for emissions arising from all electricity generation in that year, so the Life Cycle Analysis of technologies is not relevant. Direct emissions from electricity generation fuelled by unabated coal are in the range 850-1200g/kWh not including up-stream emissions from the extraction and transportation process.

Support for nuclear power, she says, will not be to the exclusion of renewables. *"Nuclear power is the most concentrated source of power available today with the smallest footprint. It is not without its challenges but these are not insurmountable. I urge you on moral, ethical, scientific and environmental grounds to rethink your opposition to it." (2)*

Jonathan Porritt and Dr Ian Fairlie wrote a joint reply to Baroness Worthington's reply to Dr Martin. In their letter they say that in their view nuclear is at best a distraction, and at worst a hindrance to tackling CO₂ emissions. In 2005, the former Sustainable Development Commission (of which Jonathan Porritt was Chair) published a report which examined the contribution that a 10 GW new nuclear programme would make to reducing the UK's CO₂ emissions. The answer was between 4% and 8%, depending on assumptions. By and large, the same is true world-wide: to make a significant contribution, hundreds of new nuclear power stations would need to be built around the world very quickly. This is simply not going to occur.

The US Rocky Mountain Institute has published several analyses of the cost effectiveness of carbon reduction measures. It concludes that efficiency measures are the most cost effective and nuclear the least cost effective.



The authors ask if it is either moral or ethical to pass waste problems on to our children and grandchildren, as we are now doing? What about the 40 or so scientific studies world-wide indicating increased child leukemias near nuclear reactors?

“In our view, as two individuals involved in these matters for more than 40 years, nuclear is so undemocratic, uneconomic, unsustainable, unhealthy and unsafe that anyone who continues to support today’s increasingly corrupted nuclear dream would appear to have lost at least part of their own moral compass.” (3)

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1. Ecologist 12th March 2015
http://www.theecologist.org/blogs_and_comments/commentators/2790138/dear_bryony_dont_dump_your_nuclear_waste_on_us.html
 2. Ecologist 9th June 2015
http://www.theecologist.org/reply/2901897/why_we_really_do_need_nuclear_power.html
 3. Dr Ian Fairlie 23rd June 2015 <http://www.ianfairlie.org/news/why-we-dont-really-need-nuclear-power/>



7. Other New Reactor News

Bradwell – the Chinese are Coming

The GMB Union wrote to the Government and safety bodies in June saying it feared the Bradwell nuclear site in Essex could be handed over “lock, stock and barrel” to China’s National Nuclear Corporation. The Chinese could then use their own technology, and possibly bring thousands of workers to the UK, dealing a blow to this country’s own nuclear industry, the union claimed.

National officer Gary Smith said in a letter to Energy Secretary Amber Rudd: *“The idea that a Chinese state company will be given a site in the UK, not far from London, where they can use Chinese labour to construct a reactor to be made in China and using Chinese components would in our view constitute economic madness and raises serious safety issues. We have got to this potentially dangerous linkage because we are relying on foreign state-owned companies to fund development of new nuclear stations having stood down our own state-owned companies to do the job that the private sector is clearly not prepared to do.”* (1)

In return for investment in Somerset's Hinkley Point the Chinese want to take over a site adjacent to the decommissioned nuclear station at Bradwell, Essex. (2)

“If the UK is in a position where we are so desperate for foreign investment in our energy infrastructure that we are prepared to completely surrender control of the design, manufacture and construction of a strategically vital nuclear reactor to a Chinese state company, then the UK Government needs to pull back and reconsider how we fund new nuclear stations.”

Nuclear waste could blight Bradwell for almost 200 years if a new Chinese reactor is approved, according to Professor Andy Blowers, chairman of the Blackwater Against New Nuclear Group (BANNG). If built the power station could be in operation for around 60 years – until around 2090. *“With the nuclear waste having to cool for a long time, they wouldn't be able to completely leave the site until the end of the next century, close to 2200.”*

Professor Blowers said: *“My point is rather more fundamental than the union's (GMB's). It is a case of no investment, not alternative investment. There shouldn't be investment from anybody, even British investors. The idea of creating more rubbish when we don't have any way to dispose of what we've already got just seems quite frankly immoral.”* (3)

BANNG has taken the unusual step of seeking direct talks with the Chinese state-owned nuclear companies who are considering developing their own nuclear power stations at the Bradwell site. Blowers, has written to the heads of the China National Nuclear Corporation and the China General Nuclear Power Group pointing out the formidable obstacles, some of them possibly insurmountable, that would have to be overcome before new nuclear power could be brought to Bradwell. BANNG is concerned that in the negotiations with the Chinese the disadvantages of the site and opposition to its development for nuclear purposes have been ignored or disregarded. The group is, therefore, calling for the opportunity to discuss with EDF and the Chinese companies the problems surrounding the development of the site. (4)



Dungeness

Meanwhile Shepway councillors are trying to get Dungeness C back on the national agenda. Councillors backed a proposal to lobby the government for a new nuclear power station on the Romney Marsh to replace Dungeness B which is due to close in 2028. (5)

Dungeness was on the original list of nominated sites published in April 2009. Before the first draft Nuclear National Planning Statement was published, Dungeness was dropped from the list of possible sites, because of concerns about flooding.

ABWRs – a serious regulatory shortfall

Concerns about reactor chemistry issues related to Hitachi-GE's Advanced Boiling Water Reactor (ABWR) have been raised by UK regulators in their assessment of the design. The company, however, says it is confident these concerns can be resolved.

Horizon Nuclear Power – a Company wholly owned by Hitachi, Ltd. – is proposing to build two ABWRs at Wylfa on Anglesey with major site work beginning in 2018 and first electricity generation before 2025; it is also looking at building ABWRs at Oldbury in Gloucestershire but the size of the plant and timescales have yet to be decided.

As part of the Generic Design Assessment (GDA) of the ABWR, the Office for Nuclear Regulation (ONR) and the Environment Agency (EA) raised a regulatory observation in April 2014 requesting Hitachi-GE to define and justify the reactor design's source terms, amongst other related matters. According to the regulators, "*The definition of the radioactive source term; the nature and amount of radioactivity, is a fundamental part in understanding and therefore being able to control the hazards associated with any nuclear facility. Once defined, it is important that the requesting party is able to demonstrate and justify that this source term is appropriate to be used as the basis for the safety and environmental cases. Failure to adequately define or justify the source term could ultimately mean that the design, operations or controls specified for the UK ABWR may not be soundly based.*"

Hitachi-GE responded with its definition and justification in January 2015. However, the regulators said the responses "*do not meet our expectations*". This, they said, "*is considered to be a serious regulatory shortfall*".

In their latest GDA progress report, for the first quarter of 2015, the regulators said, "*Reactor chemistry is proving to be a very challenging topic for Hitachi-GE, and project risks have been identified during the quarter which challenge whether a meaningful assessment of reactor chemistry during Step 3 can be achieved.*" (6)

Moorside

A public consultation into what could be Europe's largest new nuclear power site near Sellafield has opened. Plans for the facility, which would consist of three AP1000 reactors on the site at Moorside are being toured around 21 consultation events throughout Cumbria. The 10-week consultation period runs until July 25. (7)

The consultation website is here: <http://www.nugenconsultation.com/>

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1. Energy Voice 10th June 2015 <https://www.energyvoice.com/other-news/79810/gmb-warns-on-nuclear-site-safety/>
 2. Mirror 11th June 2015 <http://www.mirror.co.uk/news/world-news/nuclear-safety-fears-china-build-5866142>
 3. Essex Chronicle 18th June 2015 <http://www.essexchronicle.co.uk/Nuclear-plan-blight-Bradwell-s-community-200/story-26715329-detail/story.html>
 4. BANNG 18th June 2015 <http://banng.info/>
 5. BBC 20th June 2015 <http://www.bbc.co.uk/news/uk-england-kent-33210368>
 6. World Nuclear News 22nd June 2015 <http://www.world-nuclear-news.org/NN-UK-regulators-raise-issue-with-ABWR-design-2206155.html> and ONR 21st May 2015 <http://www.onr.org.uk/new-reactors/reports/gda-quarterly-report-jan-mar-15.pdf>
 7. North West Evening Mail 15th May 2015 <http://www.nwemail.co.uk/news/consultation-over-new-nuclear-station-near-sellafield-to-launch-tomorrow-1.1212209>



8. Don't Nuke the Climate

On June 16, seven international clean energy organizations launched a major new campaign aimed at keeping nuclear power out of all negotiations at the upcoming UN climate talks in Paris. The UN Climate Change Conference ('COP-21') will be held in Paris from November 30 to December 11.

The seven initiating groups are the two organisations behind the *Nuclear Monitor* – the World Information Service on Energy (WISE-Amsterdam) and the Nuclear Information & Resource Service (NIRS) – along with Sortir du Nucleaire (France), Ecodefense (Russia), Global 2000 (Austria), Women in Europe for a Common Future (WECF), and Burgerinitiative Umweltschutz (Germany).

Some of the same groups were critical to a similar effort at the UN negotiations in The Hague in 2000, which succeeded in barring nuclear power from the Kyoto Protocol's Clean Development Mechanism. And some of the groups also organized the large Nuclear-Free, Carbon-Free contingent to last year's People's Climate March in New York City.

Peer de Rijk of WISE-Amsterdam said: *"We are calling on 1,000 civil society organisations to join us for a campaign to block the nuclear industry's lobby activities at COP-21 and instead ensure the world chooses clean energy."*

- **Nuclear Power is Not a Silver Bullet:** Nuclear power could at most make a modest contribution to climate change abatement. The main limitation is that it is used almost exclusively for electricity generation, which accounts for less than 25% of global greenhouse emissions. Even tripling nuclear power generation would reduce emissions by less than 10% – and then only if the assumption is that it displaces coal.
- **Greenhouse Emissions from the Nuclear Fuel Cycle:** Claims that nuclear power is 'greenhouse free' are false. Nuclear power is more greenhouse intensive than most renewable energy sources and energy efficiency measures. Life-cycle greenhouse emissions from nuclear power will increase as relatively high-grade uranium ores are mined out.
- **Nuclear Power – A Slow Response to an Urgent Problem:** The nuclear industry does not have the capacity to rapidly expand production as a result of 20 years of stagnation. Limitations include bottlenecks in the reactor manufacturing sector, dwindling and ageing workforces, and the considerable time it takes to build a reactor and to pay back the energy debt from construction.
- **Nuclear Power and Climate Change** Countries and regions with a high reliance on nuclear power also tend to have high greenhouse gas emissions. Some countries are planning to replace fossil fuel-fired power plants with nuclear power in order to increase fossil fuel exports – in such cases any potential climate change mitigation benefits of nuclear power are lost.
- **Climate Change and Nuclear Hazards** Nuclear power plants are vulnerable to threats which are being exacerbated by climate change. These include dwindling and warming



water sources, sea-level rise, storm damage, drought, and jelly-fish swarms. 'Water wars' – in particular, disputes over the allocation of increasingly scarce water resources between power generation and agriculture – are becoming increasingly common and are being exacerbated by climate change.

- **Weapons Proliferation and Nuclear Winter** Civil nuclear programs have provided cover for numerous covert weapons programs and an expansion of nuclear power would exacerbate the problem. Nuclear warfare – even a limited nuclear war involving a tiny fraction of the global arsenal – has the potential to cause catastrophic climate change.
- **Renewables and Energy Efficiency:** Global renewable power capacity more than doubled from 2004 to 2014 (and non-hydro renewables grew 8-fold). Over that decade, and the one before it, nuclear power flatlined. Global renewable capacity (including hydro) is 4.6 times greater than nuclear capacity, and renewable electricity generation more than doubles nuclear generation. A growing body of research demonstrates the potential for renewables to largely supplant fossil fuels for power supply globally. Energy efficiency and renewables are the Twin Pillars of a clean energy future. A University of Cambridge study concluded that 73% of global energy use could be saved by energy efficiency and conservation measures – making it far easier to achieve a low-carbon, nonnuclear future.

Sign the Petition <http://www.nirs.org/cop21/dontnuketheclimate.htm>

Ten Reasons Not to Nuke the Climate <http://www.nirs.org/factsheets/nukesclimatefact614.pdf>



9. Radwaste Developments

The Department of Energy and Climate Change (DECC) has set up a Community Representation Working Group (CRWG) to help develop practical processes for community representation will operate, to test of public support, and community investment throughout the siting process for a Geological Disposal Facility (GDF). (1)

The CRWG will seek to define the parameters of possible host communities, propose the model for local oversight and the structures to manage community investment funds. The CRWG will report next year along with parallel public consultations considering the planning process and geology aspects of the project.

From late 2016 communities will be invited to enter in to the site selection process. The Nuclear Legacy Advisory Form (NuLeaf) – the voice of local government in England and Wales on nuclear waste issues – will support and advise local authorities interested in joining the process.

A consultation on working with communities in siting a nuclear waste ‘disposal’ facility in the UK has been launched. The government is inviting views from a range of sources including academia, the nuclear sector and other industries from experience of major infrastructure projects as well as community sectors. They do not need to be limited to the nuclear industry or radioactive waste projects. The Call for Evidence on the Geological Disposal Facility (GDF) will focus on the issues of community representation, community investment and the test of public support. (3)

The Consultation is open until 4th September. (4)

Concern has been expressed about the lack of definition of "community" as well as concern that people living alongside potential train transport routes for radioactive waste (so-called "affected communities") are not being considered as a relevant group in Government and Radioactive Waste Management Ltd (RWM) thinking.

A National Geological Screening (NGS) exercise is also being carried out by RWM by bringing together existing information about the geology of the UK (but not Scotland which has adopted a different approach to radioactive waste management) with specific reference to those features that are relevant to “the long-term safety of the Geological Disposal Facility (GDF)”.

The exercise has two parts: identifying and describing relevant geological attributes in the form of guidance; then applying that guidance across the country to bring together existing high-level geological information relevant to the GDF safety cases. These outputs will help communities in deciding whether to engage with RWM in initial discussions about hosting a GDF. (5)

An Independent Review Panel (IRP) has been set up by the Geological Society of London on behalf of DECC to assess draft national geological screening guidance developed by RWM. Independent expert review of the guidance is a key step in building public confidence in national geological screening. (6) A meeting was held on 23 June in public between IRP and RWM. A video of the meeting is available You Tube. (7)

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2. Local Government Association 16th May 2015
http://issuu.com/lgapublications/docs/lgapfirst_588_web/13?e=16807299/12883020
3. Energy Live News 1st July 2015 <http://www.energylivenews.com/2015/07/01/uk-consults-on-nuclear-waste-facility/>
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5. NDA 14th May 2015 <http://www.nda.gov.uk/2015/05/gdf-siting-directors-may-update/>
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