nuClear news

No.69 December 2014

1. Hinkley Point C – A Review of the Year

The so-called UK nuclear renaissance "*increasingly looks less a rebirth than an unsatisfactory assortment of stalling, disjointed projects*" according to energy Journalist Tim Probert. (1) At the end of 2014, six years after EDF Energy first announced its intention to develop Hinkley Point C, the Bristol Post says we can finally be reasonably confident the project will go ahead. (2) But the paper still expresses some doubts, because EDF Energy has yet to make the final investment decision and one of its partners, Areva, has some financial challenges: "*But in all likelihood the project will be confirmed early in the new year*".

Not everyone would be quite so bullish. To many it feels like the project is sleep walking towards disaster. It's just that no-one is quite sure whether the disaster will be a virtually 'unconstructable' power plant struggling to come into operation years late and vastly over-budget or the collapse of the whole project before it even starts.

Cambridge nuclear engineer, Tony Roulstone, recently described the type of reactor planned for Hinkley as 'unconstructable', and said Areva, the French company that owns the EPR design, is no longer actively selling power stations of this type. In those countries still looking to expand nuclear power, such as Saudi Arabia, China and Turkey, Areva is now pushing an alternative reactor. In China, where two EPRs are currently being constructed, the authorities have indicated that they will not use the design for future power plants. In other words, the Hinkley design is already regarded as a failure by those with most knowledge of it. (3)

The European Commissioners decided to approve subsidies reported to be up to £17.6 billion to EDF Energy in October. Doug Parr, Chief Scientist at Greenpeace calculates the subsidies to be closer to £37billion on an undiscounted basis. (4)

The Austrian Government has declared its intention to take the Commission to the European Court of Justice over the decision, (5) In the UK independent energy supplier Ecotricity is also among companies and organisations considering a legal challenge. There appears to be a groundswell of opinion among renewable energy companies and associations in Britain and Europe that something should be done. (6) This could leave the project in limbo. Legal action would take at least a year to conclude and EDF Energy would have to decide whether or not to risk proceeding with the project in the meantime in case it has to be abandoned if the legal action is successful.

And despite welcoming the Hinkley deal shadow energy minister Tom Greatrex has called on the National Audit Office to review the subsidy arrangement for the nuclear project, which means there will be uncertainty surrounding the project until at least after the General Election in May. (7) Labour has never said that if it wins the General Election it would stop new reactor construction after Hinkley. But in writing to the National Audit Office and the public accounts committee asking them to review the subsidies and to investigate whether further concessions could be secured Labour appears to some to be threatening to unpick the deal. *The Times* said that if a future Labour government backs changes to the deal, EDF could be forced to review something that has taken more than two years to resolve. (8)

Regardless of these remaining hurdles EDF Chief Executive, Vincent De Rivaz, told the Nuclear Industry Association conference in London in early December that he expects to make the final

investment decision on Hinkley in the first quarter of 2015 - in other words, before the end of March next year. (9) But remember, this is the man who said in 2009 that we would be roasting our Christmas turkeys in 2017 with electricity from the plant. (10) Then in late 2012, EDF delayed 'first concrete pour' to mid-2015, and now the plant isn't expected to open until 2023 at the earliest.

The Government, for its part, has refused to confirm that it will sign a contract with EDF allowing Hinkley C to be built before April 2015. In answer to a Parliamentary Question tabled by Caroline Lucas MP, Energy Minister Matthew Hancock gave an evasive response underlining the shaky status of the project. (11)

It is still unclear exactly who will invest in the project besides EDF. According to the Department of Energy and Climate Change (DECC) China National Nuclear Corporation (CNNC) and China General Nuclear Power Corporation (CGNPC) could take up to a combined 40% share of the equity; (China Daily most recently said the Chinese are discussing an estimated 35% stake (12)) EDF could take 45-50%, and Areva 10%, and discussions have been ongoing with other interested parties – possibly the Saudis (13) and Qataris (14) - who might take 10-15%. Building Magazine claimed that reports the Saudis might be interested in investing are untrue. (15)

Nick Butler, writing in the *Financial Times*, questioned whether French reactor vendor, Areva, which is in deep financial trouble, would be able to fund its 10% share? (16) Standard & Poor's ratings agency has downgraded the company's long-term and short-term debt to BB+ from BBB-, with a negative outlook, citing uncertainty about cash flows and recovery. (17)

The UK's nuclear future could be cast into doubt by the financial crisis at Areva, according to the *Business Green* website. The French engineering company saw its shares drop by nearly 25%, after directors suspended future profit predictions because of problems at a project similar to Hinkley at Olkiluoto in Finland. The Government is reportedly so worried that Hinkley will be delayed it has commissioned a "secret review" into the project. The probe, being led by the Treasury, is said to be examining whether the 2023 completion date is likely to be met and is apparently costing "tens of millions of pounds". The outcome of the investigation is expected at the end of the year, which *The Times* says is why EDF delayed taking a final investment decision this summer until January or February. (18)

But de Rivaz insists Areva's financial difficulties will not derail the project. He said the French government, which is Areva's majority shareholder, had agreed to support the company. (19)

A reactor of the same EPR-design as Hinkley which is being built at Flamanville in Normandy is now 5 years late, and another being built at Olkiluoto 3 in Finland is expected to be 9 years late. (20) Flamanville was originally expected to cost €3.3 billion in 2005 but this has now escalated to at least €8.5 billion. (21) Similarly Olkiluoto 3 was originally expected to cost just over €3 billion, but Areva said in late 2012 that the overall cost could end up closer to €8.5 billion. (22)

Steve Thomas, professor of energy policy at the University of Greenwich, London, says the Hinkley project "*…is at very serious risk of collapse at the moment. Only four of those reactors have ever been ordered. Two of them are in Europe, and both of those are about three times over budget. One is about five or six years late and the other is nine years late. Two more are in China and are doing a bit better, but are also running late*." (23)

De Rivaz insists that delays and cost overruns at Flamanville will not impact financially on Hinkley, but he admitted that the delays were a setback. (24)

Tim Probert says the investment decision will hinge on the level of investment from the Chinese CGNPC and CNNC. He says industry participants are not as sure as DECC that the two Chinese state nuclear firms will want to take the full 40% combined stake. In many respects the Chinese have already got what they really want, which is an agreement to have a controlling interest in UK nuclear plants in order to export to us their own reactor technology. In June, David Cameron signed an agreement with Chinese premier Li Keqiang that paved the way for the Chinese to build such a plant, possibly at Bradwell in Essex.

Probert quotes Steve Kidd, former Deputy Director-General of the World Nuclear Association and a frequent visitor to China who says "*Both Chinese companies are concerned by the extremely high cost of Hinkley Point C*." Forty per cent of £16 billion is more than $10 billion, which is a lot of money even for the Chinese. But if the price really has gone up to £24.5 billion, (25) as suggested by the European Commission, then 40% is more than $15billion.

Kidd says what the Chinese want is a foot in the door in the UK and to be able to build a reactor of their choice in a project of their choice, rather than being actively involved in the construction of Hinkley Point C, so there is nothing magical about taking a 40% share. If China doesn't invest 40% then who will fill the gap?

According to *The Times* the Chinese are demanding that their own manufacturers are handed a big slice of the contracts for Hinkley. This demand for a share of the supply contracts has thrown the talks into disarray. EDF is planning to use its existing supply chain in France for the project and has told British companies hoping to win contracts to team up with French suppliers. (26)

Simon Taylor, professor and director of the Master of Finance program at the University of Cambridge's Judge Business School sees Hinkley as a "test case" for Chinese infrastructure investment in developed nations. The UK, with its well-developed legal system of contracts and openness to foreign investment, fits well with the risk appetite of Chinese companies, he says. "*If Hinkley Point C does go ahead, it will be a landmark in China's infrastructure investment abroad. It would be starting with the most difficult case that is extremely long-term, technologically complex and controversial*." If Chinese companies can handle a project like that, they will have the confidence and experience to undertake other infrastructure projects in the UK and beyond. In turn, other developed nations may be more open to Chinese infrastructure investment. (27)

According to Building Magazine Chinese Construction Consultants who have built the same type of nuclear reactors at Taishan in China could be brought in to help on the Hinkley project, but it is unlikely that Chinese manufacturers would be able to share in equipment supply contracts because of the high level of regulatory checks in the UK required to work in the nuclear sector. (28)

EDF itself does not have a bottomless pit of cash at its disposal to invest in new nuclear plants. France's nuclear power plants commissioned in the 1970s and early 1980s are approaching the end of their 40-year design life. A report published by the French government in June stated that EDF would need to invest €110 billion from 2011 to 2033 to prolong reactors beyond 40 years,

while a recent state audit revealed EDF's nuclear power costs rose to 59.8 euro/MWh in 2013, up 21 per cent from 49.6 euro/MWh in 2011.

We might not have much of a coherent energy policy, but we do at least have the honour of breaking the record for the most expensive object ever built says Peter Atherton of Liberum Capital, now that the cost of Hinkley is up to £24 billion. "*I've looked online to see if there was a more expensive object ever built but I couldn't find one*" says Atherton. "The most expensive bridge was something like £6 billion and the most expensive building something like £5 billion." The cost of the electricity to the British consumer will be 64% more than that of a French nuclear power station. (29)

Meanwhile a new report from Forum for the Future, Nottingham Trent University and Farmers' Weekly estimates that UK farms could have a generating capacity of 20GW by 2020 compared with Hinkley's 3.2GW capacity which won't be available until 2023 at the very earliest. (30) Now former Government Chief Scientist, Professor Sir David King who was instrumental in persuading Tony Blair to ditch the 2003 Energy White Paper, which argued against supporting nuclear power and go for new reactors now says we might be able to do without them if we can develop energy storage. (31) He obviously knows a dead horse when he sees one.

On 8th October 2014 following the European Commission's decision to approve subsidies to Hinkley, Allan Jeffrey a spokesperson for the Stop Hinkley Campaign appealed to EDF Energy and the UK Government to examine in detail the flurry of recent reports from investment and energy analysts predicting a bright future for solar energy and other renewables as well as energy storage. (32)

"*The technology proposed for Hinkley Point C is well past its sell-by-date. It's time for Somerset to look to the future and develop a locally-controlled sustainable energy industry which doesn't involve leaving a toxic legacy for our grandchildren's children and which can tackle climate change and fuel poverty in a much more cost effective way*."

The reports highlighted by the group suggest that the old centralised utility model is becoming increasingly redundant and decentralised energy supply will become increasingly important in the future.

Former Labour MP Alan Simpson says the place which scares the Big 6 energy companies the most is Germany. Already, 50 per cent of Germany's electricity generating capacity comes from renewables. But big energy companies only own about 5 per cent of this generating capacity 95% is owned by farmers, small businesses, local authorities, community co-operatives and individuals. Overall 50% is owned by citizens. And now local authorities are beginning to take back control of the grid to help this energy revolution along. (33)

The question for 2015 is whether South-west England will join the renewables revolution or whether it will struggle on with redundant technology.

1. Tim Probert 5th Dec 2014 http://millicentmedia.com/2014/12/05/britains-nuclear-renaissance-a-progress-report/
2. Bristol Post 10th Dec 2014 http://www.bristolpost.co.uk/Firms-urged-seize-opportunities-Hinkley-C-nuclear/story-25501820-detail/story.html

3. Carbon Commentary 22nd Oct 2014 http://www.carboncommentary.com/2014/10/22/cambridge-nuclear-engineer-casts-doubt-on-whether-hinkley-point-epr-nuclear-plant-can-be-constructed/
4. Energy Desk 20th Nov 2014 http://www.greenpeace.org.uk/newsdesk/energy/analysis/trouble-hinkley
5. Times 7th Oct 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4229029.ece
6. Guardian 12th Oct 2014 http://www.theguardian.com/environment/2014/oct/12/ecotrcity-legal-challenge-eu-hinkley-point-c-subsidy-nuclear
7. Utility Week 13th Oct 2014 http://www.utilityweek.co.uk/news/labour-calls-for-scrutiny-of-hinkley-deal/1060952
8. Webb, T. Labour throws spanner into Hinkley Deal, Times 13th Oct 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4234474.ece
9. Building 10th Dec 2014 http://www.building.co.uk/news/hinkley-investment-decision-to-come-in-first-quarter-2015/5072640.article
10. BBC 25th Nov 2009 http://news.bbc.co.uk/1/hi/programmes/newsnight/8379274.stm
11. Dave Toke's Blog 28th Nov 2014 http://realfeed-intariffs.blogspot.co.uk/2014/11/government-implies-it-may-not-sign.html
12. China Daily 9th December 2014 http://www.chinadaily.com.cn/bizchina/2014-12/09/content_19050771.htm
13. Webb, T. French give Saudis nuclear option for Hinkley Point Plan, The Times 18th November 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4270475.ece
14. Critchlow, A. Qatar considering investment in Hinkley Point nuclear plant. Telegraph 27th November 2014 http://www.telegraph.co.uk/finance/newsbysector/energy/11257369/Hinkley-Point-nuclear-plant-to-cost-34bn-EU-says.html
15. Building 27th Nov 2014 http://m.building.co.uk/5072390.article?mobilesite=enabled&origin=bldgweeklynewsletter
16. FT 8th Oct 2014 http://blogs.ft.com/nick-butler/2014/10/08/hinkley-point-the-nuclear-winners-and-losers/
17. Reuters 21st Nov 2014 http://www.reuters.com/article/2014/11/21/markets-factors-europe-idUSL6N0TB0DO20141121
18. Business Green 20th Nov 2014 http://www.businessgreen.com/bg/news/2382517/reports-uk-nuclear-plans-threatened-by-areva-struggles and Times 20th Nov 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4272779.ece
19. Nuclear Street 5th Dec 2014 http://nuclearstreet.com/nuclear_power_industry_news/b/nuclear_power_news/archive/2014/12/05/edf-chief-de-rivaz-says-areva-financial-woes-have-not-derailed-hinkley-point-c-project-120501.aspx
20. Reuters 18th Nov 2014 http://www.reuters.com/article/2014/11/18/edf-nuclear-idUSL6N0T85BN20141118?rpc=401
21. Reuters 3rd Dec 2012 http://www.reuters.com/article/2012/12/03/us-edf-nuclear-flamanville-idUSBRE8B214620121203
22. Wall Street Journal 31st August 2014 http://www.wsj.com/articles/areva-offers-new-timeline-for-much-delayed-finnish-nuclear-reactor-project-1409534893
23. Climate News Network 24th Nov 2014 http://www.climatenewsnetwork.net/europes-nuclear-giants-are-close-to-collapse/
24. Guardian 4th Dec 2014 http://www.theguardian.com/business/2014/dec/04/edf-energy-nuclear-reactor-hinkley

25. Construction News 8th October 2014 http://www.cnplus.co.uk/news/sectors/infrastructure/energy/hinkley-point-c-construction-costs-soar-to-245bn/8670753.article

26. Webb, T. French give Saudis nuclear option for Hinkley Point Plan, The Times 18th November 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4270475.ece

27. China Daily 9th December 2014 http://www.chinadaily.com.cn/bizchina/2014-12/09/content_19050771.htm

28. Building 27th Nov 2014 http://m.building.co.uk/5072390.article?mobilesite=enabled&origin=bldgweeklynewsletter

29. Spectator 1st Dec 2014 http://blogs.spectator.co.uk/coffeehouse/2014/12/why-is-britain-building-the-most-expensive-object-ever/

30. Click Green 21st Nov 2014 http://www.clickgreen.org.uk/news/national-news/125252-farms-could-supply-enough-renewable-energy-to-match-3-nuclear-power-plants.html

31. Telegraph 21st Nov 2014 http://www.telegraph.co.uk/earth/energy/nuclearpower/11244499/Nuclear-power-may-not-be-needed-says-top-atomic-advocate.html

32. Stop Hinkley Press Release 8th October 2014 http://www.stophinkley.org/PressReleases/pr141008.pdf

33. Morning Star 26th Nov 2014 http://www.morningstaronline.co.uk/a-c11b-Who-will-champion-the-clean-energy-revolution

2. Nuclear damages attempts to tackle climate change

It is now almost 15 years since Tony Blair asked the Number Ten Performance and Innovation Unit (PIU) to carry out a thorough review of energy policy. That review ultimately led to the 2003 Energy White Paper which concluded that the current economics of nuclear power make it an unattractive option, and that there are still important issues about nuclear waste which need to be resolved.

In launching the White Paper in Parliament the Secretary of State for Trade and Industry at the time, Patricia Hewitt, said:

"*It would have been foolish to announce …a new generation of nuclear power stations, because that would have guaranteed we would not make the necessary investments in energy efficiency and renewables.*"

Unfortunately, as we know, the nuclear lobbyists got to work straight away and this policy was eventually reversed. (1)

When the Nuclear White Paper was published in January 2008 giving the go-ahead to new reactors, Professor Gordon Mackerron, who had been a prominent member of the PIU Energy Review team and went on to Chair the first Committee on Radioactive Waste Management (CoRWM), expressed concern that nuclear investments would ultimately stall. But the expectation that new reactors would be built would hold back investment in the alternatives. So we could get to 2020 and find that neither nuclear, nor other forms of carbon abatement technology had been built. (2)

Regrettably, now we are 7 years closer to 2020, it looks as though Hewitt and Mackerron's worst fears are coming true.

Nuclear power is a distraction from the urgent task of tackling climate change for five main reasons.

Firstly, nuclear power provides quite a small percentage of the UK's energy needs, so it is important that we don't allow plans to build new reactors to disrupt plans to introduce other forms of low carbon energy.

Secondly, Funding is limited. Even in boom times there is a limited supply of money, so we need to maximise the carbon savings achieved from every pound spent. But, as we shall see, nuclear is probably the most expensive way to save carbon.

Thirdly, there is a serious risk that nuclear will soak up all the funds available for low carbon energy.

Fourthly tackling climate change is urgent, the sooner we can start making savings, the bigger the cumulative impact. New reactors at Hinkley are not expected to start operating until about 2023 at the earliest, whereas other forms of carbon abatement could start making savings now.

Finally, global markets are moving rapidly towards more decentralised low carbon energy systems. But by promoting nuclear power, the UK will be bucking this trend and prolonging the life of outmoded, centralised utility models. Andy Blowers, Emeritus Professor of Sociology, and another former CoRWM member says it is this "*Business As Usual*" aspect of nuclear power which is the most insidious.

Nuclear's contribution is too small

Too much of the energy debate focuses on electricity. To read some of the media you might be left with the impression that energy and electricity are two words which are interchangeable.

But electricity actually only supplies 18% of our energy needs, so nuclear power is an even smaller proportion – about 3.6%.

To tackle climate change we need to deal with emissions from all sectors including transport and heat, as well as electricity.

For instance if we look at energy consumption in buildings – and almost half of the UK's carbon emissions are caused by buildings - we can see that more than two thirds of the energy used is for heating. We could, of course, convert all our heating to electric heating systems, but whatever way you look at it this argues for a much greater effort to be directed at energy efficiency.

Every pound spent needs to be spent on the most cost effective carbon abatement measures.

Clearly, even if we were in the middle of an economic boom, we don't have unlimited supplies of money. So we have to spend what we do have in a way which maximises the carbon savings achieved for every pound spent. Although nuclear might appear to be cheaper than some of the other forms of low carbon energy, experience tells us that nuclear costs are likely to rise, whereas renewable costs are falling rapidly. The New York Times reports (3) that the cost of providing electricity from wind and solar power plants has plummeted over the last five years, so much so that in some markets renewable generation is now cheaper than coal or natural gas. Utility executives say the trend has accelerated this year, with several companies signing contracts for solar or wind at prices below that of natural gas.

In the UK nuclear is expecting to continue receiving subsidies, under the new Contracts for Difference system, for 35 years after reactors open, whereas renewables will only receive subsidies for ten years.

Offshore wind is one of the most expensive renewables at the moment, but its costs are predicted to fall quite quickly over the next decade. Onshore wind costs are falling rapidly too, and solar will be cheaper than nuclear before Hinkley Point C opens.

But if the Government continues to attack onshore wind and continues to reduce support for offshore wind then we will fail to capitalise on the gains already made and costs won't be able to continue falling.

The cheapest low carbon option is not to use the energy in the first place. In fact many efficiency measures can be installed at negative cost. And efficiency is not just about loft insulation. Investment in LED lighting for instance can generate returns of up to 10%.

Nuclear will soak up all the funds

You might say "*well climate change is urgent, so why don't we do nuclear as well as all the other stuff*". But there is a limited supply of funds and the way the Government has organised the subsidy schemes at the moment it looks as though nuclear will use up all of those funds.

The Treasury's so-called Levy Control Framework limits the amount of money which can be collected from consumers' bills. This year the pot of money available will be £3.5bn. This will increase to £6.45bn by 2018/9. But because subsidies to low carbon energy are an ongoing commitment, £3.55bn of that will go to projects already running and only £2.9bn will be available to new schemes. The total pot will go up to £7.6bn in 2020/21, an increase of just over £1bn. We don't know the exact figure for 2023/24, but we do know that Hinkley will require around £1bn, so it will probably use up all the money for new projects. (4)

And there isn't expected to be any more money for new projects until 2027, by which time Sizewell C could be ready to start gobbling up cash.

Nuclear is too slow

The sooner we make carbon savings the greater the cumulative impact by, say, 2025. Nuclear takes a long time to build. Hinkley is expected to take about eight years, so there won't be any carbon savings until at least 2023. The two other reactors being built in Europe at the moment are both late – Olkiluoto in Finland is 7 years late and Flamanville in France is 4 years late.

Hinkley might save a million tonnes of carbon per year in eight years time, whereas a re-booted energy efficiency programme could have already saved 14 million tonnes by then. (5)

Centralised utilities - a dying model

Former Government Chief Scientist, Professor Sir David King who was instrumental in persuading Tony Blair to ditch the 2003 Energy White Paper and go for new reactors now says we might be able to do without them if we can develop energy storage. (6)

He's probably been reading the financial press. The 21st November might go down as the day the nuclear renaissance finally died in Britain. Look at UK Nuclear News for that day and you will discover that:

Consumers could be on the hook for £37bn worth of undiscounted subsidies to Hinkley over its lifetime.

The cost of Hinkley has gone up from £9bn in 2011 to £24.5bn now.

Reactor builder – Areva – which was expected to take a 10% stake in Hinkley is in the midst of a financial crisis.

The Treasury is re-examining the Hinkley project.

Meanwhile investment banks seem to have decided that the centralised utility model's days are numbered:

UBS says it's time to join the solar revolution and large power stations will be obsolete in 10 – 20 years time.

HSBC is predicting an energy storage boom.

Citi says wind and solar will continue to gain market share for coal and nuclear,

Citibank says the Big6 will lose 25% of their customers in the next six years.

Barclays has downgraded the US power sector because it can't compete with renewables. (7)

So what are the alternatives to nuclear? A new piece of research from Forum for the Future, *Farmers Weekly* and Nottingham Trent University has analysed the potential for rolling out different renewable technologies on UK farms - principally solar and wind, and some anaerobic digestion. Their report estimates that it would be relatively simple to get the first 20 GW onto the grid from farm-based solar and wind. And that could be on stream by 2020 if we get behind it, well before the projected date of 2023 for completion at Hinkley Point. (8)

Hinkley is expected to produce, at a very optimistic 90% load factor, 25TWh (billion kWh) every year.

Domestic energy efficiency alone could save 40TWh/yr by 2030 and help eliminate fuel poverty into the bargain. Other efficiency measures, such as converting commercial and street lighting to LEDs could save 4 times what Hinkley might produce.

Britain's solar industry says it could install the same capacity as Hinkley in 24 months and at comparable cost.

total electricity consumption	328TWh/yr
total energy consumption	1635TWh/yr
Hinkley (at an unlikely 90% load factor)	25TWh/yr
Offshore wind	up to 155TWh/yr
Solar Farms (just on land used for biofuel)	190TWh/yr
Commercial rooftops	30TWh/yr
Domestic roofs	140TWh/yr
Domestic efficiency by 2030	40TWh/yr
Other efficiency measures	100TWh/yr (9)

So 2015 will be a crunch year for energy policy in Britain. EDF says it will make its investment decision in January or February. But Chinese investors already appear to be wobbling. We know they don't want to build any more EPR reactors themselves – they have been described by one nuclear engineer as "unconstructable" (10). They would be mad to commit themselves to the

huge sums of money required before waiting to see whether Olkiluoto and Flamanville can be made to work.

Former Labour MP, Alan Simpson points out that we have forgotten in this country that, until 1947, most local authorities earned 50 per cent of their income from the work of their localised utilities. Germany already has 180 local authorities taking their energy grids back into public ownership, why can't we. Already, 50 per cent of Germany's electricity generating capacity comes from renewables but only 5 per cent of this generating capacity is owned by the big utilities. (11)

Recently local authorities across the UK have started to develop an energy policy. A number of local authorities have been developing what are being called either Local Authority Energy Service Trusts (LAEST"s) or Energy Service Companies (ESCO's). These exciting developments are a clear sign of interest from Councils in taking a more active role in energy policy, to alleviate local fuel poverty and promote a low carbon future. Though these policies are at an early stage at present, such developments are part of a growing move in local government to develop more comprehensive energy policies. To some extent, they are influenced by the positive role local government plays in countries like Germany, Denmark and Austria in developing ambitious local, community owned renewable energy projects. Let us hope we see more advances in this area in 2015. (12)

Catherine Mitchell, Professor of Energy Policy at Exeter University, and another former member of the PIU team, says global energy systems are going through a time of rapid technological change, which has implications for the conventional utility model. This is leading to two types of countries - those that are enabling, or at least not constraining, the change in energy systems; and those which, for various reasons, are ignoring or attempting to constrain it. While constraining change may slow it down, countries cannot stop it completely – and the question is whether by constraining change in the energy system countries are setting themselves up for a very disruptive time at some point in the future with a wider loss of innovation within their economies, as opposed to a more managed transformation. Whatever, happens 2015 will see the battle between the old and the new entered in earnest.

---

1. See Nuclear Power Trumps Democracy by Donnachadh McCarthy, Ecologist 9th Oct 2014 http://www.theecologist.org/blogs_and_comments/commentators/2587477/nuclear_power_trumps_democracy.html
2. Independent 13th Jan 2008 http://www.independent.co.uk/voices/commentators/gordon-mackerron-this-way-is-more-likely-to-leave-us-in-the-dark-770005.html
3. New York Times 23rd Nov 2014 http://www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels.html?ref=science&_r=2
4. See NFLA and Stop Hinkley submission to the European Commission http://www.nuclearpolicy.info/docs/nuclearmonitor/NFLA_New_Nuclear_Monitor_No34.pdf
5. Guardian 13th July 2013 http://www.theguardian.com/politics/2006/jul/13/greenpolitics.nuclear
6. Telegraph 21st Nov 2014 http://www.telegraph.co.uk/earth/energy/nuclearpower/11244499/Nuclear-power-may-not-be-needed-says-top-atomic-advocate.html

7. See Decentralised Energy Marches On. NuClear News No.68 November 2014 http://www.no2nuclearpower.org.uk/nuclearnews/NuClearNewsNo68.pdf
8. Farm Power: Exploring the size of the prize, Forum for the Future, November 2014 http://www.forumforthefuture.org/sites/default/files/Farm%20Power_Size%20of%20the%20Prize%20report_Nov-2014.pdf
9. See nuClear News No.58 for more details http://www.no2nuclearpower.org.uk/nuclearnews/NuClearNewsNo58.pdf
10. Carbon Commentary 22nd Oct 2014 http://www.carboncommentary.com/2014/10/22/cambridge-nuclear-engineer-casts-doubt-on-whether-hinkley-point-epr-nuclear-plant-can-be-constructed/
11. Morning Star 26th Nov 2014 http://www.morningstaronline.co.uk/a-c11b-Who-will-champion-the-clean-energy-revolution
12. NFLA Briefing 18th August 2014 http://www.nuclearpolicy.info/docs/briefings/A239_(NB125)_Local_authority_energy_trusts.pdf

3. New Mexico nuclear waste accident a 'horrific comedy of errors'

In May, this year nuClear News (No.62) reported an offsite radiation release–including plutonium – at the Waste Isolation Pilot Plant (WIPP) in New Mexico on 14 February may have been caused by a chemical reaction inside a waste drum. When the drum was filled, a new "green" cat litter had mistakenly been used which is made with materials like wheat or corn instead of traditional cat litter which is made from various inorganic geologic silicate minerals. The silicate is needed to stabilize certain kinds of radioactive waste that have nitrate salts in solution to stop them igniting when they dry out.

On February 14th there was a heat-generating chemical reaction – the US Department of Energy (DOE) calls it a deflagration rather than an explosion – compromised the integrity of a barrel and spread contaminants through more than 3,000 feet of tunnels, up the exhaust shaft, into the environment, and to air monitoring equipment approximately 3,000 feet north-west of the exhaust shaft. The accident resulted in 22 workers receiving low-level internal radiation exposure. (1)

But experiments have failed to reproduce the chemical reaction, and there are still hundreds of waste drums which have similar contents which remain intact. Determining the cause of the accident has been made all the more difficult because the precise composition of the waste in the damaged barrel is unknown.

Operations to enable WIPP to reopen will cost approximately US$242 million (€193m) according to preliminary estimates by the DOE. In addition, a new ventilation system is required which will cost US$65-261 million (€52-208m). Taking into account indirect costs such as delays with the national nuclear weapons clean-up program, the total cost could approach US$1 billion (€800m). Further costs could be incurred if the State of New Mexico fines DOE for its safety lapses at WIPP. The DOE hopes WIPP will reopen in 2016 but the shut-down could extend to 2017 or beyond.

A DOE-appointed Accident Investigation Board released a report into the accident in April. The report identified the "root cause" of the accident to be the many failings of Nuclear Waste Partnership, the contractor that operates the WIPP site, and DOE's Carlsbad Field Office. The report criticized their "failure to fully understand, characterize, and control the radiological hazard. The cumulative effect of inadequacies in ventilation system design and operability compounded by degradation of key safety management programs and safety culture resulted in the release of radioactive material from the underground to the environment, and the delayed / ineffective recognition and response to the release."

Now e-mails and documents obtained by *The New Mexican* describing safety assessments in May, June and July raise questions about the stability of dozens of other nuclear waste drums that were in the same chamber as the drum that ruptured. More recent WIPP safety

assessments have not been released, even to the union representing more than 300 WIPP workers. (2)

1. Ecologist 27th Nov 2014
   http://www.theecologist.org/News/news_analysis/2642182/new_mexico_nuclear_waste_accident_a_horrific_comedy_of_errors_that_exposes_deeper_problems.html
2. Santa Fe New Mexican 29th Nov 2014
   http://www.santafenewmexican.com/news/local_news/emails-raise-questions-about-safety-of-wipp-workers-in-underground/article_0cb47b4d-5af1-51bc-8cf3-bcf150b3a65e.html