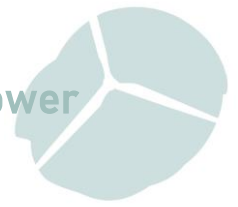


No.104 February 2017

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1. New Nuclear – Dance Macabre

With the Japanese media reporting somewhat prematurely that the UK and Japanese Governments have agreed to provide the lion's share of financing for two new reactors at Wylfa on the Island of Anglesey, and EDF Energy claiming it can build Sizewell C for at least 20% less than Hinkley Point C, one has to wonder if there is some sort of battle going on between EDF and Hitachi to get their hands on limited taxpayer funds. But all either company seems to be getting from Government at the moment is warm words. In the meantime, as we shall see in a subsequent story, the Government has cut its projections for nuclear capacity in 2035 from 17GW to 14GW.

Box 1. EPR – a disaster we must not repeat

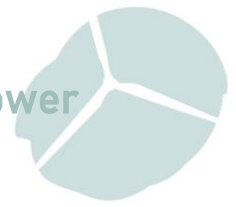
The first EPR was launched at Olkiluoto (Finland) in 2005. But setbacks and budget slippages have accumulated. The umpteenth delay in the commissioning was announced in October 2017 – it is now scheduled for May 2019. It was initially scheduled for 2009. There is a dispute between the buyer - TVO - and the vendor Areva and Siemens, with each party blaming the delays on the other and claiming billions in compensation. The case is under arbitration.

The second EPR, which has been under construction since 2007 at Flamanville (France) has also accumulated setbacks, mainly due to anomalies discovered in the composition of the steel cover and bottom of the pressure vessel. The Nuclear Safety Authority (ASN) requires that the pressure vessel lid be replaced before the end of 2024. EDF has postponed the commissioning of the reactor several times. It plans to start the Flamanville EPR at the end of 2018, for commercial commissioning in 2019. The initial schedule was for 2012. Its cost has more than tripled to 10.5 billion euros.

Two other EPRs are under construction at Taishan (China). (2) The latest commissioning delay at Taishan is the third in two years and will lead to a further deferral of 5 billion yuan (US\$770 million) in annual revenues and potentially more cost overruns, according to ratings agency Moody's. CGN said right at the end of December that generation at the two reactors had been delayed to 2018 and 2019, from the second half of 2017 and the first half of 2018 respectively. (3) CGN, which is building the plant in a joint-venture with EDF, admitted, in December, to 'partial defects' in the welding of the three parts of the deaerator. But the state-owned company stressed that the component, which helps cool down the reactor, 'is not part of the nuclear safety system'. But international consultant, Mycle Schneider, says the problem goes way deeper than that. It poses questions about lax quality control which could impact on nuclear safety. He says this goes beyond a lack of transparency and constitutes a major indictment of CGN. (4)

Sizewell C

EDF claims it can build a second nuclear power station to follow Hinkley Point C (HPC) for 20% less. HPC is expected to cost it at least £19.6 billion, and as much as £20.3 billion if delays push the start date back from 2025 to 2027, (although EDF says it is confident HPC will come on line



in 2025). The majority French Government-owned company says it can cut the construction cost for Sizewell C (SZC) thanks to efficiencies from "copying and pasting" large elements of HPC. (1)

This is for a reactor type which has yet to be built successfully anywhere in the world, with projects in France, Finland and China all delayed. CGN, the Chinese company working in partnership with EDF in Britain and China, confirmed further delays at their Taishan project in January. (See Box 1)

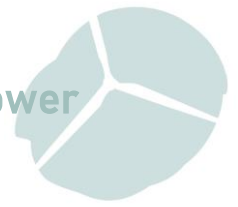
EDF expects to be able to make savings at SZC by eliminating the majority of the £2 billion costs it spent on pre-construction work at HPC. It also expects to make billions more in savings by using contractors and equipment that have already gone through training and certification processes for use on nuclear sites. Cutting the cost of building to about £15 billion could help to reduce the subsidy contract price to nearer £70 per megawatt hour (MWh) (See Box 2).

The Company believes that significant further reductions could be made if the government were to agree a new financing model so that developers did not have to bear all the upfront construction cost. EDF, along with the rest of the industry and the House of Commons' Public Accounts Committee, is urging ministers to look at alternative funding models that the National Audit Office said would have significantly reduced the eventual cost to consumers had they been used for HPC. These include the government taking a direct equity stake or adopting a regulated asset base model similar to that used for the Thames Tideway Tunnel, under which developers would receive income during construction. Without such a change, the project is unlikely to go ahead since EDF, which required a French state bailout to afford HPC, could not fund another plant in advance. (5)

The Guardian explained that the Thames Water approach for London's £4.2bn super-sewer allows the project to be taken off the company's balance sheet by creating a new company that other investors pour equity into. Pension funds are among the potential investors EDF is hoping to court. Unlike a consortium seeking a public stake for a separate nuclear power plant at Wylfa in Wales, Simone Rossi, EDF's new chief executive said government finance was not a prerequisite. (6)

Rossi says he's in talks with major investment funds to support the project. He confirmed to *The Daily Telegraph* that early stage talks have already begun and a deal may be agreed before the end of the year. The pressure to drive nuclear subsidies lower follows a dramatic decline in costs for other low-carbon energy technologies such as wind and solar power. Offshore wind in particular has halved its costs in recent years with recent projects accepting deals of under £58/MWh to build turbines. (7)

Dr Dave Toke, reader in Energy Politics at Aberdeen University, said EDF's 'cheap nuclear' plan will ruin taxpayers. If the plan involves getting taxpayers to pay for a large chunk of the 'equity' financing of the plant and getting the Government to guarantee the bulk of the rest of the costs, this could lead to the biggest black hole in the nation's finances since the financial crash which would have a catastrophic effect on public finances and deprive the Exchequer of many billions £s that could otherwise be spent on public services. This will be the subsidy to top all subsidies! (8)



Mr Rossi insisted he had “absolute support” from EDF’s leadership in Paris to push ahead with Sizewell, despite stress on the company’s finances from its existing nuclear construction projects at Hinkley in Somerset and Flamanville in France.

Horizon, another UK nuclear developer owned by Hitachi of Japan, is also aiming to attract institutional investment in its proposed Wylfa nuclear plant in Wales. Horizon believes pension funds will be interested once its plant is finished and it wants help from the UK and Japanese government to finance construction in the meantime. (9)

Box 2. Nuclear significantly more expensive than renewables

In a paper for the NGO Nuclear Forum Neil Crumpton writes: It is increasingly obvious that the cost of nuclear energy is becoming significantly more expensive than a mix of intermittent renewable technologies even after higher estimates of additional system integration costs are added in. The Hinkley Point C (HPC) deal has faced widespread public criticism including from the Public Accounts Committee (PAC).

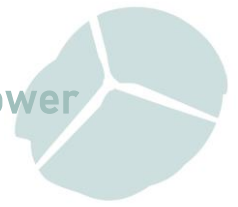
The Sept 2017 offshore windfarm auction awarded 15 year contracts around £60/MWh for 2022 delivery. Contracts for 2025-27 delivery could well fall further. Additional 'system' costs, i.e. the extra needed for intermittent renewables [offshore wind], comprising gas-fired back-up, 'gas' balancing, electrolyzers and other costs, are likely to be in the range of £7.50/MWh more than a new-build nuclear-inclusive system equivalent.

So a reasonable offshore wind+ system comparator or 'counterfactual' for mid to late 2020s delivery would be around £ 67.50 /MWh (in 2017 prices) for the first 15 years. Contract costs would likely fall further by the time the 2020s turbines would need replacing in the late 2040s. In contrast, HPC cost is £ 98.00/MWh (in 2017 prices for 35 years) falling to £95.00/MWh if a Sizewell C is built.

A case can be made that the BEIS Sept 2016 Value for Money (VfM) assessment of HPC was so flawed in various assumptions and analyses that the next generations of British children will pay around £30 billion more as electricity consumers than they would have if HMG had followed a renewables pathway. Yet Chancellor Hammond in his November 2017 budget spoke about 'not saddling our children with debts' one moment then announced that renewables funding to 2025 will be minimal the next. Notably, 2025 is when the Government is hoping that several nuclear new-builds will be coming online. So new nuclear schemes would from that time be drawing on the lion's share of low-carbon funds or other major subsidy mechanisms for 35 years (to around 2060) leaving renewables to fight for scraps.

That said, a 2017 National Grid report suggests that offshore wind may not need any subsidy by 2040 and the new BEIS climate change minister Claire Perry was enthusiastically saying on TV recently that some PV schemes are already subsidy-free.

Rossi used a recent speech to talk down the extent to which other technologies could provide the new low-carbon power the UK will need from the late 2020s. Rossi acknowledged the



challenge facing nuclear power from the falling cost of renewable generation. But he said a fair comparison should include the cost of storing and balancing intermittent wind and solar power, which is not always available when needed. On this basis, he said, nuclear could remain competitive provided that construction and financing costs were reduced. (10)

Energy efficiency was important but would not be enough to offset a growth in demand as other sectors such as cars turn to electricity, he said. Gas was useful but not green enough to meet the UK's climate targets, he added. Wind and solar power were welcome but both were limited in the role they could play, Rossi claimed. Large-scale battery storage, which EDF was working on in the UK, was useful but run flat in half an hour, he said. Despite the criticisms of competing technologies, he said Britain should install as much renewable energy as possible. "To summarise, the recipe is to use as much wind as you can, sprinkle some sun, some batteries, some gas around it, and put on a base of nuclear and put it in the oven," he said. (11) A 2010 paper published in the journal "Energy Policy" looked at the history and the economics of the French PWR programme. The French nuclear case, it concluded, illustrates the perils of assuming a lowering of costs as a result of learning over time in the scale-up of large-scale, complex new energy supply technologies. The uncertainties in anticipated learning effects of new technologies might be much larger than often assumed, including also cases of "negative learning" in which specific costs increase rather than decrease with accumulated experience. (12)

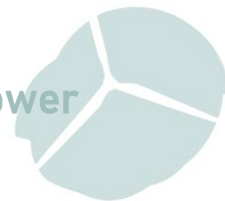
Wylfa

Greenpeace says the Japanese and UK governments have refused to confirm or deny reports that both are considering investing in the Wylfa nuclear project. (13)

Duncan Hawthorne — head of the Hitachi consortium that aims to build a nuclear plant at Wylfa— does not believe the project can proceed without an agreement with the government on the financing structure. He says Hitachi cannot be expected to keep "burning money". The implication is that public sector capital has to be involved. Nuclear power requires big upfront investment.

Nick Butler, writing in the FT says it is hard to imagine anything below £5bn would make a material difference. Before deciding, the government should address some crucial questions. If funds are provided for Wylfa, will they also be offered to the new nuclear projects at Moorside and Bradwell? But are any of the new nuclear stations really needed? Wind power has come down in price dramatically and a combination of new wind and natural gas supplies and serious investment in efficiency to reduce consumption could meet all the targets at a significantly lower cost than the new nuclear on offer — even without further technological advances in energy storage. So the decision on Wylfa is no trivial matter. At one level, it would confirm that new nuclear cannot proceed without state investment. At another, it would indicate that the era of energy privatisation initiated in the 1980s is over. The next few weeks will tell us whether we are at an inflection point. (14)

On 3rd January the Japanese newspaper, Mainichi, reported the Japanese government is poised to guarantee the full amount of loans that three megabanks will extend for Wylfa. The newspaper said a group of banks, including the three megabanks and the government-affiliated Japan Bank for International Cooperation (JBIC), will extend approximately £9.75bn in loans to



Hitachi. (15) A few days later the Asahi Shimbun went further claiming that Japan and Britain have agreed to provide the lion's share of financing for the project with the two governments loaning a combined £14bn in loans with the help of financial institutions and acquire a stake in Horizon Nuclear Power Ltd. (16)

Oddly, nothing was mentioned in the UK media until the FT made the more measured observation that the British and Japanese governments were exploring options for joint-financing of Wylfa, a softening of the UK's previous refusal to commit public funds to construction of new reactors. Letters have been exchanged between London and Tokyo in which the governments expressed support for the Wylfa project and agreed to consider contributing to its financing. Partial public financing for Wylfa would represent a new approach to nuclear construction in the UK by drawing on the government's access to cheap debt to reduce capital costs. But it would also expose taxpayers to some of the associated heavy expense and high risk. The FT continued:

"Japan's Asahi Shimbun newspaper reported last week that the UK and Japanese governments were willing to work with financial institutions to extend as much as \$20bn in loans to finance Wylfa, and also to acquire a stake in Horizon. Several people involved in the project said no such details had yet been agreed but the exchange of letters between the two governments late last month had increased confidence on all sides." (17)

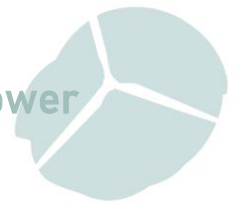
The Japanese government told Greenpeace: *"We are aware that this has been reported, but our understanding is that at present there has been no specific decision made."* When asked about the numerous media reports on public financing a UK Treasury spokesperson said: *"the government is engaged in constructive discussions with a number of new nuclear developers. These discussions are commercially sensitive and it would be inappropriate to share at this time."*

In a scathing editorial Asahi Shimbun said:

"Using taxpayer money to help finance a company's project to build a new nuclear power plant overseas would force the public to shoulder the huge risks of a questionable policy undertaking to rescue the embattled nuclear power industry. It is highly doubtful that massive public financing for such a project will receive broad support from the public ... If Hitachi's nuclear project fails, the government-affiliated financial institutions that provide financing for the project will incur heavy losses, which may eventually have to be covered with taxpayer money. The government should rethink its headlong rush to help finance the project and make careful reassessments of the risks involved as well as the necessity of the measure from a policy perspective." (18)

Nuclear Intelligence Weekly reported that Hitachi is ramping up threats to pull the plug on Wylfa if it doesn't receive subsidy guarantees from the government within the next six months. Getting government guarantees in that timeframe could prove a tall order, however, and since the Japanese firm has already poured more than £2 billion into the project it's hard to see it throwing in the towel if its deadline isn't met.

The proposed outlines of a deal for Wylfa, and possibly other UK new-builds involves a simple trade-off: a government equity stake in the project in exchange for a government-guaranteed "strike price" at which the Wylfa reactors would sell their output for a delineated amount of time for significantly less than the £92.50/MWh. Proponents argue a government equity stake



would help pull down total capital financing costs. Talks are thought to be discussing the possibility of the UK government providing a third of the financing, with the Japanese government and banks pitching in another third, and Hitachi accounting for the remainder. But the ultimate model could shift. Officials in the Business Energy and Industry Department are thought to be keen to go-ahead because, in their view it would reduce electricity costs, whereas some in the Treasury are reluctant to add new infrastructure projects to the government's balance sheet. (19)

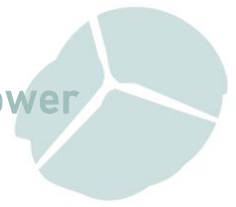
Tom Burke, chairman and founding director of the environmental group E3G, told the Greenpeace website - Uearthed that *"the struggling nuclear industries of Japan, France and Korea are all looking to the UK to rescue them. What they are getting from the government is warm words and long promises. The truth is that there is no room for additional nuclear in Britain's rapidly modernising electricity supply system. Without power purchase agreements paid for by consumers none of these projects will go ahead however much they reduce their capital cost."* (20)

Antony Froggatt, a senior research fellow in energy at Chatham House, told Uearthed that the Conservatives were shifting their policy because new nuclear plants are unlikely to come online without significant state backing. "What we're seeing, and this has been the case for the last 5-10 years, is that the Conservatives have gradually been salami slicing away at their pledge to allow the construction of new nuclear, provided that they 'receive no public subsidy'," he said. *"There's been a shift on this because nuclear can't happen without significant government financial support."* (21) Funnily enough that's exactly what the nuclear industry told the Government in 2009. (22)

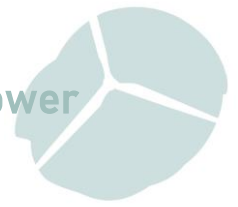
In June 2006 *The Financial Times* reported that Tony Blair would rule out financial incentives to rig the market in favour of new nuclear reactors. Nuclear power wouldn't need subsidies according to Whitehall officials because an internal economic analysis suggested nuclear power would be a more cost-effective way of generating electricity than both gas and coal. (23) Walt Patterson said Mr Blair and his officials appear to be victims of the nuclear amnesia *"If we make the same mistakes all over again, let us at least be sure that our children know who to blame,"* Patterson says. *"Let us call the first one the Tony Blair nuclear plant."* (24)

In 2007, the then Trade and Industry Secretary Alistair Darling said the government will not subsidise new nuclear power plants, so if the private sector does not provide the huge investments needed, the country will have to do without. He told the House of Commons Trade and Industry Committee the Government is not going to contribute to the cost of it. (25)

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2. Small Modular Reactors vs Intermittent Renewables

A new report from the Policy Exchange argues that nuclear power will be vital for achieving a fully decarbonised electricity grid. The paper, supported by engineering giant Rolls Royce, argues that a surge in electricity demand from electric vehicles (EVs), coupled with the need to phase gas and coal off the power grid, will leave a generation gap that is best solved with small modular nuclear technology. (1)

A crucial part of the Policy Exchange argument is:

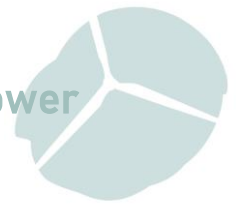
"...alternatives such as battery storage would prove too expensive to roll out on the scale needed to meet mid-winter power demand, while sourcing extra power through European interconnectors will become increasingly difficult as their grids decarbonise."

And.

"The diffuse and intermittent nature of solar and wind means that we cannot rely on them for 100% of our energy needs – for example, January typically sees at least one week where virtually no electricity is produced by either wind or solar compared with what is needed. Buying in electricity through interconnectors from other Western European nations will be increasingly difficult as our neighbours also turn to wind and solar and so have less capacity to export, while the battery storage capability to back up renewables could cost up to £1 trillion. We need a reliable and affordable low carbon form of energy – small modular reactors have the potential to be that technology."

The nuclear industry has long argued that small modular reactors (SMRs), which produce about a tenth of the power of a large nuclear power station, could be quicker and cheaper to roll out than full-scale nuclear sites. But analysis by consultancy Atkins for the Department for Business, Energy and Industrial Strategy, picked up by *The Guardian*, concluded energy from SMRs could cost more initially than large nuclear, because of the costs connected with developing new technologies and the loss of economies of scale. Nevertheless, the Policy Exchange report recommends SMRs form part of the UK energy mix, and urges the government to "*proceed swiftly*" with the development of at least one third-generation SMR design once the results of the current government consultation on its next generation nuclear plans are published.

Policy Exchange says SMR producers should start researching technology to allow nuclear plants to produce hydrogen. Demand for hydrogen is likely to grow as it replaces natural gas on the heating grid and is potentially used to fuel cars and trains. Odd really, to be suggesting a technology which would be perfect for balancing intermittent renewables having just claimed that energy storage is too expensive. Energy Brainpool, for instance in a report for Greenpeace Energy (a German utility company), showed that if surplus wind power above the 3.2GW equivalent to Hinkley Point C was used in windgas facilities first to produce hydrogen (H₂), then convert it to methane (CH₄), and this was then fed into the conventional gas distribution system or stored in existing gas storage facilities and later reconverted into electricity in combined-



cycle gas turbine (CCGT) power plants when the need arises, the cost would be €7.2 billion lower than the subsidy cost of Hinkley Point C. (2)

Meanwhile Emeritus Professor of Technology Policy at the Open University, Dave Elliott, author of a book called “Balancing Green Power” has been looking further into Demand Management. (3) He cites an article in Low Tech Magazine which says

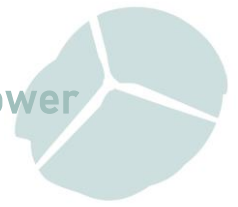
“If we could manage to adjust all energy demand to variable solar and wind resources, there would be no need for grid extensions, balancing capacity or overbuilding renewable power plants. Likewise, all the energy produced by solar panels and wind turbines would be utilised, with no transmission losses and no need for curtailment or energy storage.”

It continues: *“of course, adjusting energy demand to energy supply at all times is impossible, because not all energy using activities can be postponed. However, the adjustment of energy demand to supply should take priority, while the other strategies should play a supportive role”.* (4)

Low Tech magazine looks at the various ways of balancing the variable inputs from renewables – back-up fossil fuel plant; renewable overcapacity; transnational super-grids; and finally storage. The magazine says all these options require major efforts and just raise the cost of renewable supply. By contrast, not using power does not! So Low Tech Magazine then looks at the prospects for demand management. It says *“if the UK would accept electricity shortages for 65 days a year, it could be powered by a 100% renewable power grid (solar, wind, wave & tidal power) without the need for energy storage, a backup capacity of fossil fuel power plants, or a large over- capacity of power generators”.*

In contrast Elliott concludes that a synergistic mix of the options, including flexible smart grid demand side response, backup supply and storage (including of Power to Gas derived hydrogen), along with super-grid balancing, may be able to reduce system costs. Indeed, one study suggested that *“flexibility can significantly reduce the integration cost of intermittent renewables, to the point where their whole-system cost makes them a more attractive expansion option than CCS and/or nuclear.”* (5)

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3. New Nuclear 3 Gigawatts down - 14 to go.

Richard Black at the Energy and Climate Intelligence Unit (ECIU) reports that government forecasts for UK energy and carbon emissions released in January downgrade expectations for new nuclear power stations. Last year, BEIS believed that the UK power system would be totting 17 gigawatts (GW) of nuclear capacity in 2035. That has now shrunk to 14GW. It's basically one fewer projected new power station.

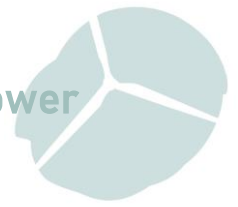
Along with this fall in nuclear expectations comes an upwards adjustment to the amount of renewable generation capacity expected – though BEIS still envisages the build rate falling in the late 2020s. The projections have abandoned an earlier assumption that renewable capacity wouldn't expand at all in the years 2028-2035, which – given the likely costs, technological advances and growing flexible demand – was literally incredible.

Still, we are left with an uncomfortable situation. That 14GW of nuclear capacity would leave a big hole if it didn't happen. Yet, as the government has tacitly acknowledged by downgrading its nuclear forecast, there's no certainty over any of the proposed power stations. There's no doubt that the government and industry are sensitive to the charge that Hinkley is just too expensive. They have also been spooked by the offshore wind contracts awarded last year at £57.50/MWh – less than two-thirds of the Hinkley price.

Black suggests setting up a competitive auction process for fixed-price contracts for the nuclear stations that the government believes we need, just as it did with offshore wind. Hinkley aside, we have five nuclear projects bidding for four slots. The government could simply say something like: 'Ok, we're going to have one auction every two years from 2019 to 2025. To enter, you'll have to have regulatory approval for your reactor and planning permission. If you win, you'll have eight years to get your power station up and running, or incur penalties.' Looking more broadly, there is a school of thought that says none of the nuclear stations should be built because the entire rationale for baseload power, in an age of increasingly flexible generation and consumption, is disappearing – and that on economics alone, new nuclear power will never compete with the alternatives. Black says the government doesn't believe this, which is why it's still projecting a big role for nuclear going forward. Well, then: if it believes 'firm' power is needed, why not allow non-nuclear 'packages' that make up a 'firm' power offer to compete on equal terms? You could, for example, have a package of offshore wind farms, storage and peaking gas-fired power stations, of capacity equal to the proposed nuclear station, competing with it on a level playing field. Allow SMRs, if they ever come close to reality, to compete too. (1)

Carbon Brief reports that the projections also include less than half as much new gas capacity by 2035 as expected last year and a quarter of the 2015 figure. In contrast, by 2035 BEIS now expects twice as much renewable capacity as it did in 2015 and twice as much battery storage as projected last year.

However, the UK is still set to miss its legally binding carbon targets, BEIS projects, with emissions from transport and homes falling slowly or not at all. It says the gap to meeting targets will be closed as its plans and policies are fleshed out.



The projections assume a “steady frequency of deployment of new nuclear plants” between 2025 and 2035, even though only one scheme – the Hinkley C plant – has signed a contract with government. (BEIS notes: “*These projections are not based on developers’ proposed pipeline of nuclear projects.*”)

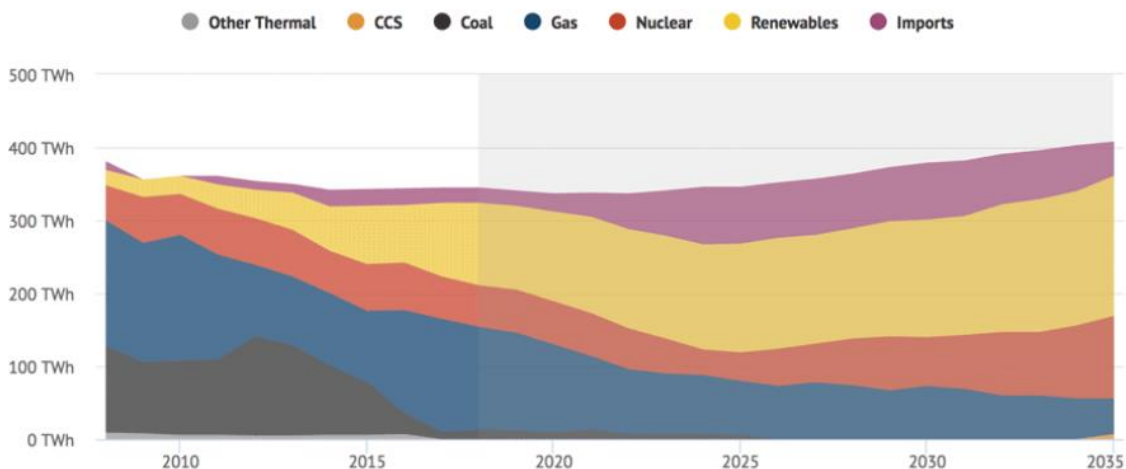
The most striking shift in recent BEIS projections is away from new gas capacity. Back in 2012, the government’s gas generation strategy had suggested 26 GW of new gas would be needed by 2030 to replace retiring coal and nuclear plants. Now, BEIS expects just 6GW of new gas to be built by 2035, with most of this coming in the next four years. In contrast, BEIS has become increasingly optimistic about the expansion of renewables, seen adding 45GW by 2035 (up from 23GW in 2015 and 39GW last year). The prospects have also improved for storage, now expected to reach 8GW (up from zero in 2015 and 4GW last year). Even this number could prove low, with nearly 5GW already being proposed.

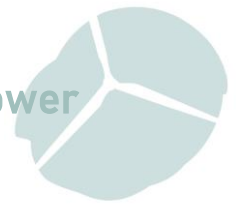
One question raised by the higher projections for renewable generation is whether enough new wind or solar farms will be built to supply this extra electricity. The projections suggest renewable output must increase 51TWh by 2025 and 65TWh by 2030. BEIS has already signed contracts with schemes that will deliver an estimated 37TWh, according to analysis from the Grantham Institute on Climate Change and the Environment. This leaves a gap of 28TWh to be filled in the 2020s, equivalent to around 6.7GW of offshore wind.

The next CfD auction is due to take place in spring 2019. This will have up to another £557m available, which, on its own, is enough for more than 10GW of offshore wind, even if prices are no lower than they were last year. The money set aside by BEIS is, therefore, more than enough to deliver the extra renewable generation implied by its projections, without any contribution from extra onshore wind or solar, which lack government support and access to contracts. Subsidy-free onshore wind and solar are becoming increasingly viable, however, potentially bypassing government plans.

2017

Projected sources of UK electricity





But the gap to be filled by new renewables will be much larger, if electricity imports are lower and if nuclear new-build fails to materialise, or is slower than expected. (2)

Clean Growth Strategy doesn't go far enough

The Government's Clean Growth Strategy, required under the Climate Change Act, sets out the next steps to reduce the UK's greenhouse gas emissions and tackle climate change. Although ambitious, the Committee on Climate Change (CCC) says the Strategy does not go far enough. Urgent action is needed to flesh out current plans and proposals, and supplement them with additional measures, to meet the UK's legally-binding carbon targets in the 2020s and 2030s. The CCC also warned that there are "significant" risks to the delivery of existing projects, such as the new Hinkley Point nuclear plant. The CCC also warned that relying on new nuclear plants for low-carbon electricity carried risks. "*Nuclear has a history of not delivering on time or on budget,*" said Lord Deben. Any new nuclear plants after Hinkley "*would have to come in at a much, much reduced cost*", given the very low cost offshore wind now offers. (3)

The Committee makes various recommendations to urgently firm up policies and proposals in the Clean Growth Strategy, including generating 85% of the UK's electricity from low-carbon sources by 2032. (4)

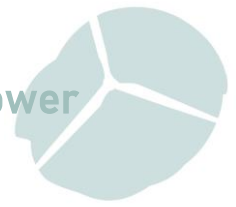
It is not obvious how this is compatible with a programme of around 14GW of new nuclear stations. HPC might come on-stream around 2025-27. If a finance package and probably some public funding can be worked out there might be another 3GW ordered by 2020, which means it wouldn't be connected much before 2030. If the Government decides to pay what it takes ordering even more nukes in the short term it would run into an already constrained nuclear supply chain and push up construction costs. This would make getting anywhere near a competitive price for electricity much more difficult as well as slowing down the build time. Brexit will compound this problem by exacerbating the skills shortage.

Even on some optimistic assumptions about financing and construction times, nuclear can only get us part of the way to 85% by 2032. This means that, if we are to meet the CCC recommendation, we would have to deploy enough renewables and energy efficiency between them to fill the gap. But if we were to do that then the already difficult problem of turning off cheap renewables to allow continuous operation of expensive nukes would be even more intractable.

So the Government is faced with the choice of either continuing with its new nuclear programme and ignoring the CCC recommendation, because nuclear power wouldn't be able to meet a 2032 deadline, or accepting the CCC recommendation and supporting a much increased renewables programme.

Urgency

"There has been a three-year hiatus in decision making on new policies to deliver our carbon goals, and the clean growth strategy must mark a new phase," said Michael Grubb, professor of international energy and climate change policy at University College London. *"The Government is making all the right noises on support for the low-carbon economy, but these must be turned into action: we need a year of decision-making."* (5)



Richard Black called on ministers to put in place new policies “fast”. *“Three easy wins ... would be cutting company-car tax for electric vehicles, repealing the ban on onshore wind power, which is the cheapest form of electricity generation, and rebooting Zero Carbon Homes. All of those could be done inside six months if ministers get on with it.”* (6)

A BEIS spokesperson said they are confident the clean growth strategy meets their legal commitments under the Climate Change Act. *“Our proposals will continue to evolve whether in response to costs of renewable energy coming down, improved evidence about climate change, wider trends in technology or the economic opportunities delivered through our industrial strategy.”* (7)

Renewables falling short

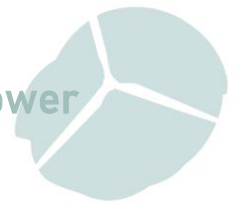
Fresh data from Bloomberg New Energy Finance revealed that the UK’s investment in renewable energy has fallen dramatically for the second consecutive year. Mary Creagh MP, Chair of the Environmental Audit Committee, said that current rates of investment *“simply won’t deliver enough renewable energy to meet our legally binding carbon reduction targets”*. (8)

CCC joined several organisations in calling for a route to market for solar. It has suggested introducing new routes to market for solar and other established low carbon technologies. One means of achieving this would be to welcome solar and onshore wind back into the Contracts for Difference mechanism, something which the two technologies have effectively been excluded from since 2015. By contracting for additional low carbon generation the government would effectively mitigate the risk of under-delivery from new nuclear and interconnectors. (9)

Offshore Wind

Offshore wind capacity could reach 30GW by the 2030s with the right support from the government and Ofgem, Aurora Energy Research has claimed in a new report. The market intelligence firm says offering offshore wind projects “zero-subsidy” Contracts for Difference and permitting them to stack revenues from balancing and ancillary services could also lower the typical household electricity bill by £20 per year. Under the present arrangements, Aurora expects offshore wind capacity, which currently stands at 6GW, to rise to between 20GW to 24GW by the mid-2020s. The low-carbon subsidies already awarded by the government, including in the latest Contracts for Difference auction, will bring the total to 14GW. The £557 million of additional annual support which has been promised for future auctions is projected to add between 6GW and 10GW.

Aurora says this 20-24GW could be increased to 30GW with no additional funding by offering subsidy-free contracts and removing regulatory barriers that prevent offshore windfarms from offering ancillary services and participating in the capacity market and balancing mechanism. (10)



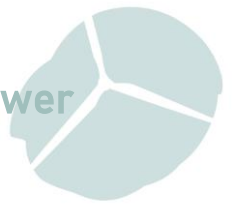
Renewables – follow the money

We don't have to wonder any longer whether renewable energy resources can power our future economy, but rather, "*how quickly can we reach a truly low-carbon future?*" says Kevin Hally of the Rocky Mountain Institute. Simply put, it's now safe to say that clean energy isn't just winning—it has officially won. As we focus our efforts on accelerating the adoption of clean energy, here are some compelling reasons why the clean energy future can't be stopped.

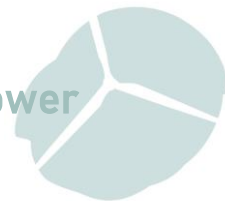
Perhaps the most sure-fire proof of a global transition to clean energy is to follow the money. The research teams at Bloomberg New Energy Finance (BNEF) report that "*Renewable energy sources are set to represent almost three quarters of the \$10.2 trillion the world will invest in new power generating technology until 2040.*" When faced with the overwhelming amount of money flooding the sector, it's hard to argue that the future will be anything but renewable-powered.

The "expensive" renewables myth is dead. In late December 2017, construction began on a 3 MW solar project in New Mexico that will sell its power below 4.5 cents per kilowatt-hour (3p/kWh) beating coal and natural gas. In January 2018, Colorado utility company Xcel Energy received "*shockingly low bids*" for electricity from renewable sources? Wind power bids had a median average price of 1.8c/kWh, and solar's median bid was 2.95c/kWh. Even with storage technology costs included—allowing renewables to generate 24/7 just like fossil fuels—the average wind price was 2.1c/kWh and the average solar price was 3.6c/kWh. (11)

1. ECIU 5th Jan 2018 <http://eciu.net/blog/2018/nuclear-time-for-open-competition>
2. Carbon Brief 8th Jan 2018 <https://www.carbonbrief.org/analysis-uk-government-slashes-outlook-for-new-gas-power-plants>
3. Guardian 17th Jan 2018 <https://www.theguardian.com/environment/2018/jan/17/uk-to-miss-legal-climate-targets-without-urgent-action-official-advisers-warn>
4. Committee on Climate Change, 17 January 2018 <https://www.theccc.org.uk/2018/01/17/uks-ambitious-clean-growth-strategy-must-include-urgent-action/>
5. Independent 17th Jan 2018 <http://www.independent.co.uk/environment/electric-cars-petrol-free-uk-government-advisers-advice-clean-growth-strategy-a8162736.html>
6. FT 17th Jan 2018 <https://www.ft.com/content/0e7939e8-fa9a-11e7-a492-2c9be7f3120a>
7. Independent 17th Jan 2018 <http://www.independent.co.uk/environment/electric-cars-petrol-free-uk-government-advisers-advice-clean-growth-strategy-a8162736.html>
8. Telegraph 17th Jan 2018 <http://www.telegraph.co.uk/business/2018/01/17/government-clean-growth-plan-falls-short-climate-targets/>
9. Solar Power Portal 17th Jan 2018 https://www.solarpowerportal.co.uk/news/ccc_calls_for_a_route_to_market_for_solar_as_it_seeks_more_ambition_urgency



10. Utility Week 22nd Jan 2018 <https://utilityweek.co.uk/zero-subsidy-contracts-could-push-offshore-wind-to-30gw-by-2030s/>
11. Rocky Mountain Institute 22nd January 2018 <https://rmi.org/news/5-reasons-clean-energy-future-cant-stopped/> See also Renew Economy 29th Jan 2018 <http://reneweconomy.com.au/plunging-costs-make-solar-wind-and-battery-storage-cheaper-than-coal-83151/>



4. UK Government starts its sixth search for a nuclear waste dump site in 42 years.

The Department for Business, Energy and Industrial Strategy (BEIS), covering England and Northern Ireland, and the Welsh Government, have opened separate consultations which basically presage the sixth search for a nuclear waste dump site in 42 years. BEIS has released 890 pages of consultation documents on developing a nuclear waste repository.

The Government says they want to hear from stakeholders and members on the geological disposal programme regarding the draft Working with Communities policy and the draft National Policy Statement. (1)

Communities in England, Wales and Northern Ireland are to be offered £1m a year to volunteer to host an underground nuclear waste disposal facility for thousands of years. The financial incentive – or bribe - is one way the government hopes to encourage communities to volunteer after previous efforts failed in 2013 when Cumbria county council rejected the project. The payments would rise to £2.5m annually as deep investigative boreholes are drilled. (2) *The Times* says over 20 years this could add up to £42m - £1 million a year for about five years, rising to £2.5 million a year for 10-15 years while boreholes were drilled to investigate whether the geology was suitable.

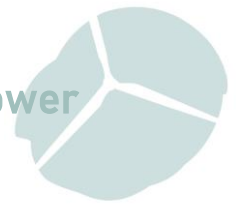
Some newspapers said the Geological Disposal Facility (GDF) would cost £12bn but *The Times* explained it would cost £19bn because new nuclear operators will add £7bn to the £12bn contributed by taxpayers.

The proposals appear to weaken the power of county councils making it harder for them to prevent a community from agreeing to host the GDF. The consultation document says the final decision will be subject to a “*test of public support*”, which could be a local referendum. The right to vote in the referendum could be restricted to a small area around the proposed site. The decision on holding a referendum would be taken by a “*community partnership*” involving representatives from councils, businesses and community groups. (3)

The Times says Cumbria is still viewed as the most suitable location because of the ease of transporting waste at Sellafield and the willingness of the community. However, other areas with ageing or decommissioned nuclear plants have been suggested, including Dungeness, Kent, and Hartlepool, in Co Durham.

Radioactive Waste Management Ltd joins UKAEA, Nirex and the Radioactive Waste Management Division of the NDA who have searched for a site for a GDF on the pretext that it is “*acknowledged as the best solution for managing higher-activity radioactive wastes in the long-term.*”

Whilst failing to acknowledge the recent Swedish Environment Court decision which just said “no” to the industry’s Nuclear Waste Company SKB’s license application for a final repository for spent nuclear fuel in Forsmark, Sweden, (4) Ann McCall, Radioactive Waste Management’s (RWM) GDF Siting and Engagement Director, said:



“Geological disposal will provide a safe, secure and long-term solution to managing the UK’s radioactive waste, and RWM welcomes the public consultations launched today which place communities at the heart of the process. As the delivery body for geological disposal, we are eager to hear people’s views on how we can work with communities to progress this important programme on behalf of society.”

Johanna Sandahl, President at the Swedish Society for Nature Conservation (SSNC) said:

“The fact that the Court rejects the power industry’s Nuclear Waste Company SKB’s applied solution means of course that the problem of how to finally dispose the spent nuclear fuel from the Swedish nuclear power plants remains. Though, this shows the strengths in a functioning environmental proceeding, in which safety issues and good documentation are required.”

A UK GDF would probably use the very packaging technology using copper, rejected in Sweden, where the technology (called KBS3) has been developed. It is an Ostrich-like posture to borrow a phrase from Professor Andrew Blowers book 'The Legacy of Nuclear Power' (Routledge, 2017) *“It puts its head in the sand. It doesn't see the hunter, but the hunter blasts its backside with his gun!”* (5)

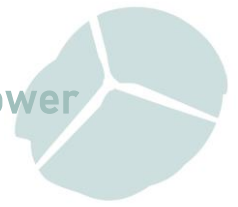
For over 4 decades the UK Government has been trying to deliver a geological disposal facility (GDF). The Nuclear Free Local Authorities (NFLA) says throughout its 38 years of operation, it has been heavily engaged in this debate. It remains sceptical that a deep underground repository is the most environmentally sound solution for managing the UK’s huge burden of radioactive waste. It notes that the Nuclear Waste Advisory Associates have outlined over 100 key technical and scientific concerns around such developments, (6) and NFLA has seen no resolution to these issues from the government or RWM.

Sweden and Finland are regularly put forward as the forerunners of the ‘international consensus’ on deep waste repositories. The Swedish court decision is therefore a pivotal ruling that needs to be considered across all countries with nuclear power programmes. Unlike in the UK, the Swedish Government has been willing to genuinely hear all sides of the argument on this development, and has provided funding for a non-governmental organisation (NGO), MKB, to raise the concerns of those uncomfortable with the concept of deep waste repositories. The Court has found MKB’s arguments more compelling, despite the Swedish nuclear regulator previously approving the capsule design. (7)

An intolerable burden on communities into the far future

Former CoRWM member Professor Andrew Blowers, in a letter to The Guardian said: *“in 1976, Lord Flowers pronounced that there should be no further commitment to nuclear energy unless it could be demonstrated that long-lived highly radioactive wastes could be safely contained for the indefinite future. Ever since, efforts to find a suitable site for a GDF have been rejected by communities. There is, therefore, little evidence to support the government’s claim that it is satisfied that effective arrangements will exist to manage and dispose of the waste that will be produced from new nuclear power stations”.*

He continued *“Deep disposal may be the eventual long-term solution but demonstrating a safety case, finding suitable geology and a willing community are tough challenges and likely to take a*



long time. The search for a disposal site diverts attention from the real solution for the foreseeable future, which is to ensure the safe and secure management of the unavoidable legacy wastes that have to be managed. It is perverse to compound the problem by a new-build programme that will result in vastly increased radioactivity from spent fuel and other highly radioactive wastes which will have to be stored indefinitely at vulnerable sites scattered around our coasts. A new-build programme would create an unmanageable and intolerable burden on communities into the far future. To suggest that a repository is the solution is in the realm of fantasy". (8)

The nuclear industry and the government repeatedly claim that the volume of nuclear waste produced by new reactors will be small, approximately 10% of the volume of existing wastes; implying this additional amount will not make a significant difference to finding an underground dump for the wastes the UK's nuclear industry has already created. (9) The use of volume as a measure of the impact of radioactive waste is, however, highly misleading.

Volume is not the correct measure to use to assess the likely impact of wastes and spent fuel from a new reactor programme, in terms of its management and disposal. The 'high burn-up fuel' which the proposed new reactors are expected to use will be much more radioactive than the spent fuel produced by existing reactors. Rather than using volume as a yardstick, the amount of radioactivity in Becquerels in the waste would be a much more appropriate way to measure the impact of nuclear waste from new reactors.

According to Radioactive Waste Management Ltd, the radioactivity from existing waste (i.e. not including new reactors) is expected to be 4,770,000 terabecquerels (TBq) in the year 2200. The Radioactive Waste Management Ltd Derived Inventory 2013 calculates that the waste inventory in 2200 after a 16GW programme of new reactors would be around 27,300,000 TBq – almost a six-fold increase. That means an extra 22,530,000TBq (almost five times the amount already produced) or 1,408,125TBq for every GW of new nuclear capacity. (10)

So for every Gigawatt of new nuclear capacity, the radioactive waste inventory will increase by a staggering 30%!

A short history of the attempts by the UK Government and its waste agencies to locate a radioactive waste repository

First Attempt:

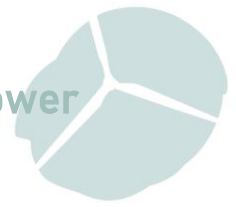
1976 UKAEA search begins.

1981 Public inquiries fuel massive public opposition to the programme, but test drilling was only ever carried out at one site – Altnabreac in Caithness. The UK Government backs down and abandons the programme of test drilling in December 1981.

Second Attempt:

1982 Nirex is formed and announces a new policy: a deep anhydrite mine under Billingham in Cleveland was proposed as a site for ILW, and Elstow in Bedfordshire was proposed as a site for the shallow burial of LLW.

1986 Billingham abandoned.



Third Attempt:

1987 Three additional sites are nominated to join Elstow.

May 1987 UK Government abandons the programme.

Fourth Attempt:

Nov 1987 Nirex launches “The Way Forward”.

1989 – The focus for Nirex is on Sellafield & Dounreay.

March 1997 – UK Government reject Nirex’s Sellafield planning application.

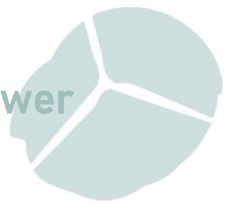
Fifth Attempt:

July 2002 UK Government announces that it was going to establish a new independent committee (CORWM) to review options for managing radioactive waste and to make recommendations. It recommends a deep waste repository with significant caveats.

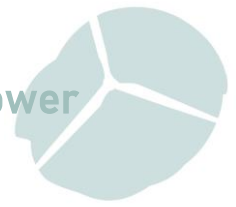
Aug 2012 West Cumbria Managing Radioactive Waste Safely Partnership report published.

Jan 2013 Cumbria County Council decides to withdraw from the process.

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1. RWM 25th January 2018 <https://www.gov.uk/government/news/beis-and-welsh-government-open-geological-disposal-consultations>
 2. Guardian 25th Jan 2018 <https://www.theguardian.com/environment/2018/jan/25/communities-offered-1m-a-year-to-host-nuclear-waste-dump> and Telegraph 25th Jan 2018 <http://www.telegraph.co.uk/business/2018/01/25/government-search-begins-towns-willing-have-radioactive-waste/>
 3. Times 26th Jan 2018 <https://www.thetimes.co.uk/edition/news/42m-offer-to-communities-that-take-radioactive-waste-svrjj29nb>
 4. MKG 23rd Jan 2018 <http://www.mkg.se/en/the-swedish-environmental-court-s-no-to-the-final-repository-for-spent-nuclear-fuel-a-triumph-for-th>
 5. David Lowry’s Blog 25th Jan 2018 <http://drdavidlowry.blogspot.co.uk/2018/01/the-atomic-ostrich-policy-uk-ignores.html>
 6. Nuclear Waste Advisory Associates Issues Register, March 2010 <http://www.nuclearwasteadvisory.co.uk/wp-content/uploads/2011/06/NWAA-ISSUES-REGISTER-COMMENTARY.pdf>
 7. NFLA 24th Jan 2018 <http://www.nuclearpolicy.info/news/uk-government-plans-deep-underground-radioactive-waste-repository-nfla-urges-regulators-look-swedish-court-ruling/>
 8. Guardian 24th Jan 2018 <https://www.theguardian.com/environment/2018/jan/24/exposing-uk-government-foolly-of-investment-in-new-nuclear>
 9. For example, Dr Peter Bleasdale who went on to become Managing Director of the National Nuclear Laboratory said: “Already there are significant volumes of historic wastes safely stored, and a programme of new reactors in the UK will only raise waste volumes by up to 10%.” BBC 13th May 2008 <http://news.bbc.co.uk/1/hi/sci/tech/7391044.stm>



10. Geological Disposal: An overview of the differences between the 2013 Derived Inventory and the 2010 Derived Inventory, RWM Ltd July 2015 <https://rwm.nda.gov.uk/publication/differences-between2013-and-2010-derived-inventory/>



5. National Policy Statement Consultation

The Department for Business, Energy and Industrial Strategy has launched a consultation on its proposed process and criteria for the designation of potentially suitable sites as part of a new National Policy Statement (NPS) for nuclear power above 1GW single reactor capacity for deployment between 2026 and the end of 2035.

National Policy Statements (NPS) are intended to establish the case for Nationally Significant Infrastructure Projects, as defined in the Planning Act 2008. The current nuclear NPS (EN-6), published in 2011, lists 8 sites as potentially suitable for the deployment of new nuclear power stations by the end of 2025. These sites are: Hinkley Point C, Wylfa, Moorside, Sizewell, Bradwell, Oldbury, Hartlepool and Heysham.

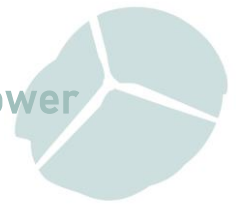
The Government is now considering the planning framework for new nuclear power for deployment after 2025. The first step towards this is to consult on the process and criteria for designating potentially suitable sites for the deployment of new nuclear power stations between 2026 to 2035 and with over 1GW of single reactor electricity generating capacity. There will be a further consultation on the draft NPS, which will build on the outcome of this consultation.

Taken together with the overarching NPS for Energy (EN1), the Government says the current nuclear NPS sets out the need for nuclear power, whilst also providing planning guidance for developers and for the Planning Inspectorate and Secretary of State in their consideration of applications. Yet when the Government first endorsed Hinkley Point C, (HPC) it was projecting an increase in electricity consumption of 15% by now, whereas in practice we are consuming 15% less than a decade ago. (In 2005 it was 29,981 ktoe . By 2015 it had fallen to 26,031 ktoe – a 15.2% decrease.) In other words it made a 30% error. This is despite a 13% increase in GDP over the last decade. HPC is only due to deliver 7% of consumption. So, in fact, there is no “need” for new nuclear power stations before or after 2025. (1)

In his introduction to the consultation document, the Minister for Energy and Industry admits that the new nuclear programme has taken a long time to progress so it is now necessary to designate a new nuclear NPS to facilitate nuclear power stations at sites capable of deployment between 2026 and 2035. In July 2017, EDF Energy revealed that Hinkley Point C is likely to be delayed by 15 months to 2027 (2). More recently the former energy secretary, Sir Edward Davey, who signed off on Hinkley Point C has cast doubt on whether the project will ever get built at all, let alone by 2027. (3)

It is now almost certain that no new nuclear power stations will be operational on any of the sites designated in the current NPS by 2025. Horizon Nuclear says it is aiming to generate the first electricity from Wylfa Newydd in the mid-2020s. (4) But it has yet to reach a deal on financing the reactors with the Government. (5) Tom Samson, the chief executive of NuGen, which is planning to build new reactors at Moorside, near Sellafield, has said they will not be up and running by 2025 either, but he declined to give a new target date. (6) Horizon says it's unlikely that construction would even start at Oldbury until the late 2020s at the earliest. (7) Sizewell C is not expected to begin generating electricity until 2031 (8) and there is currently no overall defined timeline for the Bradwell B project. (9) No proposals have been put forward for Hartlepool or Heysham.

Instead of admitting that its new nuclear programme has been a failure, and that by the time any of the proposed reactors come on line nuclear power will be obsolete (10) the proposed new NPS simply carries forward the designated sites from the current NPS, and suggests that

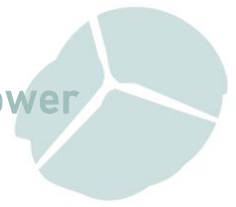


new sites may be designated in the 2020s. Unlike the current Nuclear NPS, the new draft clarifies that the sites are designated for reactors larger than 1GW. However, in recognition of the recent the clamour from the nuclear industry for a programme of small modular reactor construction it says the Government will consider planning issues related to smaller reactors separately.

This consultation closes at 11:45pm on 15 March 2018.

For a longer briefing on this consultation see <http://www.no2nuclearpower.org.uk/wp/wp-content/uploads/2018/01/National-Policy-Statement-new-nuclear-1GW-post-2025.pdf>

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6. Hinkley Notes

Consultancy firms working for the government on the Hinkley Point C nuclear power station were advising the project's Chinese investor and its French builder at the same time, according to *The Times*. KPMG, the professional services group, was paid £4.4 million between 2012 and 2017 as a financial adviser to the energy and business departments, despite telling officials that it was also acting for China General Nuclear Power Corp on the project. The apparent conflict of interest has been revealed after the Information Commissioner's Office intervened to press for disclosure from the Department for Business, Energy and Industrial Strategy.

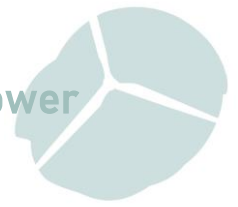
In tendering for a 2015 contract, KPMG told officials that "*as DECC [the Department of Energy & Climate Change] is fully aware, a KPMG team is currently acting for [China General Nuclear Power Corp] in relation to their potential investment into [Hinkley Point C]. This work is being carried out by a team, separate to the KPMG team acting for DECC, operating under strict internal conditions.*" The auditing firm added that it had "*mature policies and procedures ... to identify and manage potential conflicts of interest*", including "*properly segregated resources ... to handle the projects*".

Previously, officials had redacted the information, claiming that it was commercially sensitive. In a second potential conflict, Lazard, the financial advisory firm, was paid £2.6 million between 2012 and 2015 to advise the business department on Hinkley Point. Details of its previously redacted tender documents reveal that it was an adviser to EDF, the French developer that is investing in Hinkley Point alongside the Chinese. A source said that Lazard's advice to EDF was not related to the Somerset project.

Meg Hillier, chairwoman of the Commons public accounts committee, said that Hinkley Point was crucial public infrastructure and therefore it was "*vital that auditors get full sight*" of the potential conflicts. It "*looks cosy*", she said, adding that it was "*not really appropriate*" for firms to be advising both sides. The details have been released more than a year and half after *The Times* complained to the Information Commissioner's Office, which informally advised the business department to reconsider its position.

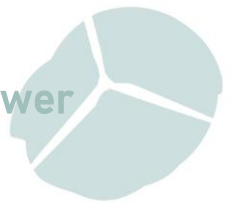
A report from the National Audit Office in June found that the government's deal had "*locked consumers into a risky and expensive project with uncertain strategic and economic benefits*". The project has been riddled with delays and controversy over its spiralling costs. The National Audit Office also criticised the business department for insufficiently managing the potential conflict of Leigh Fisher, another government adviser. *The Times* reported in November 2016 that Leigh Fisher, the management consultant, had been awarded contracts worth a combined £1.2 million despite telling officials that the British division of Jacobs Engineering Group, an American firm that owns Leigh Fisher, was working for EDF on Hinkley Point. (1)

KPMG responded by saying it was appointed as DECC's financial and commercial advisor in July 2012, to advise DECC in the negotiation of the contract for difference with EDF. A commercial agreement between DECC and EDF was reached in October 2013. 'KPMG was subsequently appointed by CGN in March 2014 to act as their financial advisor on the Hinkley Point C deal with EDF, providing financial advisory, diligence, tax and accounting advice to CGN alongside a wider team of advisors. 'DECC was consulted and granted permission, prior to KPMG being appointed by CGN. KPMG put robust processes in place to identify and manage potential



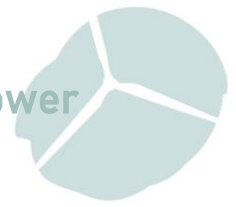
conflicts of interest, including the use of separate “ring fenced’ teams”. ‘KPMG did not work for EDF as a financial advisor on Hinkley Point C.’ (2)

- Fears are growing among Hinkley Point contractors about their ability to recruit enough workers. The worries come despite industry-leading pay rates on the project which could see skilled civil engineering operatives earn £70,000 a year. Much of the groundwork has now been completed on the site by a Kier BAM joint venture. Main civils contractor Bouygues and Laing O’Rourke (BYLOR) will be looking to employ around 3,500 people when the site is in full swing. One project source said: “*Quite a lot of the workers on site up to now have been employed through agencies but the main civils workers will be directly employed. That’s a lot of staff to find and people are realising now what a big ask that is going to be.*” (3)
- EDF plans to dump 300,000 tonnes of mud, dredged from alongside the Hinkley Point C nuclear power site, off Cardiff Bay. Campaigners want more tests and for the licence to dump to be suspended because they fear the mud could have become contaminated by discharges from Hinkley Point A and B nuclear reactors. Following last December’s second meeting of the Welsh National Assembly’s Senedd’s Petitions Committee considering a petition of more than 7,000 signatures calling on the Welsh Government to intervene, the Committee announced a third meeting at which they would request the presence of Natural Resources Wales (NRW), and The Centre for Environment, Fisheries and Aquaculture Science (CEFAS), which is an executive agency of the UK Department for Environment, Food and Rural Affairs. The third meeting took place on 9th January 2018. NRW and CEFAS were permitted to each give a short presentation and were then subjected to cross examination on the issues of concern raised by the Campaign. NRW said the approach taken to the controversial marine licence application would “*probably be very different*” were it received today, in order to give people extra reassurance. CEFAS, which carried out the initial tests, said it was “*very happy*” with the advice it had provided to NRW. Committee members pressed CEFAS on the Campaign’s claim that the extent radiological monitoring was deeply inadequate because it focused heavily on surface sediment samples (0 to 5cms deep) and not the deeper sediments which would contain elevated levels of radioactivity discharged in years when higher discharges were permitted. The petitions committee agreed to write to NRW with further questions, and to suggest that it requests additional testing of the mud. Once they have received a response from the regulator they will then consider whether a full Senedd debate on the issue is required. EDF Energy hopes to start dredging in the summer of 2018 and has insisted the work poses no threat to the marine environment or human health. Tim Deere-Jones, marine pollution consultant and prominent nuclear critic who has spearheaded the campaign against the dumping, said the committee had validated his concerns. “*It shows that they are dissatisfied by the quality and quantity of the data submitted. We applaud their decision to try and get those data gaps filled in.*” (4).
- Rents in Bridgwater have risen by 8% in the last year, putting local people at risk of homelessness due to their inability to compete with Hinkley Point C (HPC) construction workers whose wages are 30% above the local norms. An EDF Energy spokesperson displayed arrogant indifference when interviewed on local BBC news. Meanwhile, local Councillors and Officers shrug their shoulders and wring their hands at how ineffectual



their efforts to push a few hundred bed spaces forward have proved, beds will themselves be snaffled by HPC workers given the 4,000 bed accommodation shortfall. Estate and Letting Agents can simply rub their hands as demand grossly exceeds supply, giving them fatter margins, and holiday rentals are swiftly waved through by local planners as long term lets. Even casual visitors to the area looking simply for a B&B discover there's not a bed to be had in the town.

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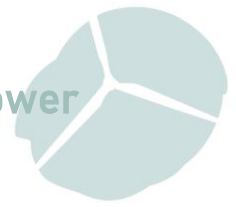


7. Wylfa Notes

Wylfa B could increase the UK inventory of radioactive waste by as much as 80%. The Nuclear Free Local Authorities (NFLA) Welsh Forum has submitted its views to Natural Resources Wales (NRW) on the radioactive waste elements of the Advanced Boiling Water Reactor (ABWR) design proposed for the Wylfa site in Anglesey. NRW is consulting on whether it will issue an environmental permit to Horizon Nuclear, wholly owned by Hitachi, for Wylfa B. This is concentrating now on issues around the radioactive waste that would be generated from such a reactor, how it will be managed and stored and for how long it will remain on site. NFLA Vice-Chair Councillor David Blackburn said:

“This NFLA submission on Wylfa B’s radioactive waste programme has gone into much detail about the radioactive high burn-up fuel that would be produced from such a reactor, should it ever be built. Such waste would have to remain on site for as much as 160 years and Wylfa B alone could increase the current UK radioactive waste inventory by as much as 80%. NFLA does not see such a waste burden being beneficial to the people of Anglesey or of Wales. There are far safer, less expensive alternatives that do not produce such hazardous materials as what Wylfa will generate. Wales would be far better off then to build solar, tidal, wind, hydroelectric and geothermal energy facilities instead, with energy efficiency and energy storage solutions adequate to deal with intermittency issues.” (1)

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1. NFLA 15th Jan 2018 <http://www.nuclearpolicy.info/news/nfla-submission-radioactive-waste-elements-reactor-design-wylfa-b-increase-uk-inventory-radioactive-waste/>



8. 2018 – the Year of the Hydrogen Fuel Cell?

If 2017 was the year of the electric vehicle, then 2018 may well be the year of the hydrogen fuel cells. In 2017, numerous stories emerged, all suggesting that companies with one eye on the horizon view hydrogen technology as a viable piece of the low-carbon jigsaw puzzle. South Korean motor company Hyundai unveiled a hydrogen vehicle concept – set to go on sale this year - as one of the 14 new “environmentally focused” vehicles to be introduced by 2020. Hyundai is part of the Hydrogen Council, which will pledge \$10.7bn towards hydrogen projects over the next five years. Oil giant shell is another council member and launched three of the UK’s first fully-branded hydrogen refuelling stations in recent months. (1)

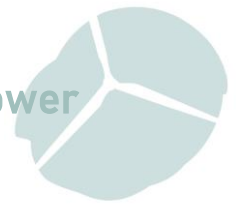
Meanwhile energy networks are preparing to dilute Britain's natural gas grid with low-carbon hydrogen for the first time in a radical bid to cut emissions from the country's heating system. Within weeks, a consortium of grid operators and experts will begin safety work in 130 homes and businesses before blending hydrogen into the methane-rich gas which has been used to heat British households and companies for over 50 years. For over a year National Grid's gas network spin-off Cadent Gas and Northern Gas Networks have studied plans to pipe hydrogen directly into the natural gas grid in partnership with Keele University. The Hydeploy consortium plans to inject enough hydrogen to fill 20% of the gas grid, before rolling out the project across larger areas. Blending hydrogen across the whole of the U K could save 6m tons of carbon every year, or the equivalent of removing 2.5m cars from the roads. A report from KPMG found that converting the UK to hydrogen gas could be £150bn to £200bn cheaper than rewiring British homes to use electric heating powered by lower-carbon sources.

However, it could still mean a £170 hike in annual gas bills by 2050. Crucially, KPMG said hydrogen heating would be the least hassle for energy customers because very few appliances would need to be replaced. The existing gas grid would need only minor upgrades because it was originally designed for hydrogen before the North Sea boom provided a flood of cheap natural gas to burn instead. The plan is a crucial part of efforts to cut carbon from heating, which makes up almost a fifth of the UK's total carbon emissions, because hydrogen produces only water vapour and heat when burned - with no carbon emissions. (2)

ITM Power which is part of the HyDeploy consortium, will be supplying a 0.5MW electrolyser to the programme to demonstrate the use of blended hydrogen in the UK gas grid. The £6.8 million project, funded by Ofgem and led by National Grid, is a key enabling project which will establish a framework for hydrogen gas-grid injection in the UK and open up a new UK Power-to-Gas market. National Grid Gas Distribution, together with Northern Gas Networks and the HyDeploy Consortium, has been awarded £6.8 million by Ofgem’s Network Innovation Competition. The funding will be used for a pioneering green heating initiative, using Keele University’s gas network in Staffordshire. (3)

Scottish Gas Network’s 100% hydrogen project is assessing the viability of constructing and operating the first hydrogen distribution network in Scotland.

Meanwhile *the Telegraph* reports on a Welsh hydrogen fuel cell runabout that could revolutionise the car industry. A hydrogen fuel cell, in the most basic terms, converts hydrogen and oxygen into pure water and electricity. The water is drinkable and is the only real emission,



making the Rasa a healthy car to drive around town. But hydrogen as a fuel for transport has significant benefits on a global scale, even when compared to battery-electric cars – the well-to-wheel CO₂ emissions of the Rasa are estimated to be around 40g/km. It's not without its challenges. There are questions about where the hydrogen comes from, just as there are questions about how the energy to charge electric cars is made. Perhaps the biggest obstacle is a lack of infrastructure. There are just five working hydrogen pumps within the M25, and one just outside it at Cobham services – the only one on the motorway network. (4)

Eco-friendly hydrogen trains could be introduced on to one of Britain's busiest rail networks under plans to phase out dirty diesel engines. The government said that the technology should be considered on the Great Western network between London and the West Country. The Department for Transport indicated that hydrogen could be used as an alternative power supply on smaller branch lines that will never be electrified. (5)

Green Gas

Green gas could enable Scotland to meet energy goals outlined in the country's first Energy Strategy, according to the UK's trade body for anaerobic digestion (AD). The Scottish government's strategy details its vision for Scotland's future energy system until 2050. Its new target is to supply at least 50 per cent of energy from renewable sources by 2030. (6) Charlotte Morton, Chief Executive of the Anaerobic Digestion & Bioresources Association (ADBA), said, *"The Scottish Government has set itself ambitious but necessary targets for generating renewable energy in its new Energy Strategy, and renewable heat and electricity produced through AD can make an important contribution to these goals, as well as reducing emissions from landfill, creating rural jobs, and helping to restore degraded soils."* AD is a technology that uses natural processes to recycle organic wastes and process purpose-grown energy crops into green gas that can then be used to produce renewable heat and power, low-carbon transport fuel, and nutrient-rich biofertilizer. AD is currently delivering 45 MWe of power and 11,000 m³/hr of heat in Scotland - enough gas to supply the equivalent of approximately 85,000 homes. (7)

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