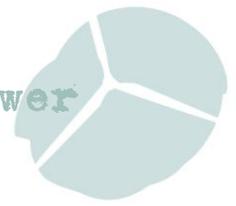


No.76 August 2015

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1. Nuclear Futures

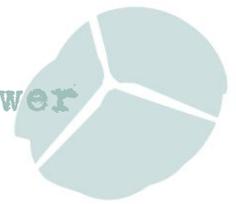
Andrea Leadsom, Minister of State for Energy and Climate Change, told the House of Commons that the Government hopes to be able to meet 35% of the UK's electricity needs from nuclear by 2028. (1) The map below gives DECC's view of the UK's nuclear future.



- Sites currently generating
- *NPS sites with development in progress*
- *NPS Sites, no firm plans at present*

UK final energy demand, as opposed to just electricity, was 1,778 TWh/y in 2013 – nuclear supplied 64.1 TWh or less than 4%. Optimistically this figure might increase to 7% by 2030.

UK electricity demand was about 360TWh in 2014. The proposed new nuclear reactors operating at an unlikely 90% load might produce around 119TWh per year, or about 33% of the 2014 figure. Sizewell B is also expected to be still open in 2030 supplying perhaps another 9TWh per year bringing the number up to 36%. But the Government has told us to expect a doubling of electricity demand by 2050 Friends of the Earth uses a demand figure of 470TWh for 2030, in which case nuclear would only be providing 27%. (10)



What are the chances of all these reactors being built on time and budget and then achieving load factors of 90%?

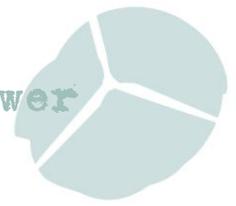
Here's a table of the reactors that are currently proposed.

	Capacity	Annual output (90% load factor)	Investment Decision	Expected Opening Date
Hinkley Point C 2 x EPRs	3.2GW	25TWh	Sept 2015	2023
Sizewell C 2 x EPRs	3.2GW	25TWh		2027 (2) - 2028 (3)
Wylfa 2 x ABWRs	2.7GW	21TWh	2018	2024 (4) First half of 2020s (5)
Oldbury 2 x ABWRs	2.7GW	21TWh		2027 (6) Construction not expected to begin until late 2020s or early 2030s (7)
Moorside 3 x AP1000s	3.4GW	27TWh	End of 2018	2024 – 2026. (8) 2025 (9)
Total	15.2GW	119TWh		Maximum by early 2030s

EPRs

There are three EPR construction projects in the world. Olkiluoto-3 (Finland) was started in 2005 and expected to come on-line in 2009 at a cost of €3 billion (US\$3.6 billion). By 2015, it was nine years late with completion was not expected before 2018 at a cost (not revised since 2012) of €8.5 billion (US\$9.5 billion) – so the cost has almost tripled.

Flamanville-3 was started in 2007 and expected on-line in 2012 at a cost of €3.2 billion (US\$4.7 billion). By 2015, completion was not expected before 2017 –five years late - at a cost of €8.5 billion (US\$9.5 billion).



Taishan-1 & -2 in China started construction in 2009 and 2010 when they were both due on-line in 2014. In 2015, completion was expected in 2016 – two years late - but no reliable cost information has been published. (11)

AP1000s

According to Chris Goodall on his Carbon Commentary website Westinghouse is having the same problems with the AP1000 as the un-constructible EPR. (12) The first orders for the AP1000 were for two units at each of the Sanmen and Haiyang sites in China. Construction of these units started in 2009-10 with completion expected in 2013-15. By 2015, the Chinese plants were running 18–36 months late.

Four further orders for AP1000s came from the USA - two each for the Vogtle in Georgia and Summer in South Carolina. The two Vogtle reactors started construction in 2013 with expected completion in 2016-18. Original estimates for the total price to the utilities buying the power stations were about \$14bn (about £9.5bn). The most recent announcement of construction delays came in February 2015. The eventual completion date for Vogtle 3 is now expected to be June 2019. Vogtle 4 should be finished in June 2020. The expected delay for Vogtle 3 is now 39 months, more than doubling the initially expected construction time, but the project is not yet half complete. Industry estimates of the eventual final cost to the contractors are vague and imprecise. They currently seem to be around \$18bn (around £12bn).

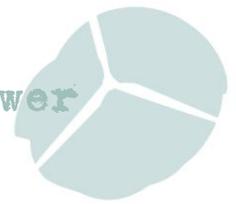
The two AP1000s being built at Summer in South Carolina are two and three years late, and delays have added \$1.2bn to the original \$10bn cost estimate. (13)

ABWRs

Four Advanced Boiling Water Reactors (ABWRs) have been built in Japan to time and budget. (14) But none of these have a capacity factor above 73% and two have capacity factors of less than 40%. A capacity factor is the amount a plant generates compared to the amount that would be generated if it was operating at full power all of the time. Nuclear power plants are costed on the basis that they will achieve capacity factors of 80-90 per cent. With a capacity factor of 45 per cent any nuclear power project comes out needing twice the power price to be an economic proposition. (15)

	Started construction	Commercial Operation	Capacity Factor	Ref
Kashiwazaki-Kariwa-6	3 rd Nov 1992	7 th Nov 1996	72.8%	(16)
Kashiwazaki-Kariwa-7	1 st July 1993	2 nd July 1997	68.2%	(17)
Hamaoka-5	12 th July 2000	18 th Jan 2005	38.5%	(18)
Shika-2	15 th 20 th Aug 2001	March 2006	37.9%	(19)

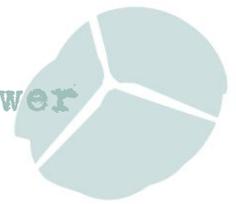
In Japan, two further ABWRs – Shimane-3 and Ohma-1 - had started construction when the Fukushima crisis happened, so construction has been suspended. Nine other proposed ABWRs in Japan have been deferred or suspended. (20)



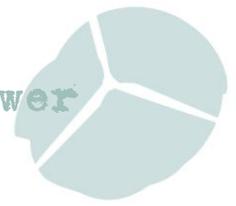
Construction of two 1350 MWe ABWRs began at Lungmen, near Taipei, in 1999, with the first originally scheduled to enter commercial operation in 2006 and the second in 2007. However, the project has been beset with political, legal and regulatory delays. Pre-operational tests were successfully completed at unit 1 in 2014, start-up has been delayed until a national referendum, not expected until 2017. Construction of unit 2 has been suspended. (21)

Meanwhile, the Office of Nuclear Regulation (ONR) have told Hitach-GE – the company that wants to build two ABWRs at Wylfa on Anglesey and two at Oldbury in Gloucestershire - to rewrite vital risk plans - called a probabilistic safety analysis (PSA) - because the safety risk models put forward are not up to UK standards. The ONR issued the firm with an official "regulatory issue" notice earlier in July. Officials said the PSA was *"insufficient to present an overall picture and thus, a reasonable understanding of the UK ABWR risk"*. (22) Hitachi-GE presented ONR with a Resolution Plan which the Regulator has judged as credible. If submissions made by Hitachi-GE meet regulatory expectations, the issue should be adequately resolved within their declared GDA timescales. (23)

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2. Bradwell: Handing Future UK nuclear Infrastructure to the Chinese

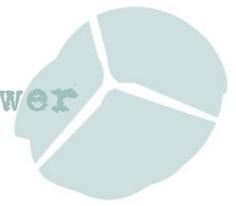
The Government is preparing to hand over future UK nuclear infrastructure to Chinese firms, according to the GMB Union in a “total betrayal” of UK workers. The GMB raised concerns earlier this month about the prospect of the Bradwell, site in Essex, being given “lock, stock and barrel” to the Chinese National Nuclear Corporation.

Energy Secretary Amber Rudd responded in a letter to the union: *“The UK government welcomes overseas investment in the UK’s new nuclear programme. This includes investment and participation from Chinese companies in the Hinkley Point C project and progressive involvement more generally in the UK’s nuclear new build energy programme. In the future, this could include leading the development of a site in the UK and the potential deployment of a Chinese reactor technology in the UK, subject to meeting the stringent requirements of the UK’s independent nuclear regulatory regime.”* (1)

Gary Smith, GMB National Secretary for energy, said *“I have studied the letter from Amber Rudd carefully and conclude that it looks that the UK Government is preparing for a hand over of the future UK nuclear infrastructure to the Chinese state. This is a total betrayal of workers in the UK and of the long term interests of the UK economy.”* (2)

Professor Andy Blowers, chairman of the Blackwater Against New Nuclear Group (BANNG), takes a rather more fundamental objection to the proposals than the union's. He said *“There shouldn't be investment from anybody, even British investors. The idea of creating more rubbish when we don't have any way to dispose of what we've already got just seems quite frankly immoral.”* (3)

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3. Hartlepool, Trawsfynydd & Small Modular Reactors

New energy minister Andrea Leadsom has given the strongest signal yet that the Government is looking to support a new era of factory-built, nuclear power stations - with a Newcastle company leading the way on their development in the UK. Speaking at the Nuclear Industry Association conference Ms Leadsom said: *“Small Modular Reactors are an option we are investigating further. These have the potential to drive down the cost of nuclear energy and make financing easier through shorter construction times and lower initial capital investment requirements, in addition to high-value commercial opportunities.”* (1)

Amidst a growing sense of frustration and hand-wringing over the delays in the current nuclear programme, new hope has emerged that support is on the way for a home-grown generation of Small Modular Reactors (SMR). Newcastle company Penultimate Power, formed by long-standing nuclear power advocate Ian Fells, emeritus professor of energy at Newcastle University, was created in 2012 to develop SMRs. It is the only UK company positioned to do so and wants to develop a manufacturing plant in the region and trial the world’s first SMR on land next to the existing Hartlepool nuclear power plant. (2)

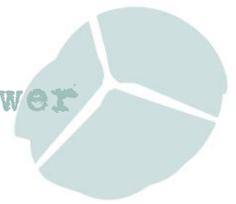
A feasibility study by the National Nuclear Laboratory (NNL) was published in December 2014. It concluded that the UK has an opportunity *“to regain technology leadership”* in SMRs. It said there is a very significant market for SMRs in places where large reactors would be unsuitable and calculates the size of the market to be approximately 65-85 GW of new capacity by 2035, valued at £250-£400 billion, with demand in the UK of around 7 GW by then. (3)

In March 2015 the UK Government responded (4) to a Select Committee report saying that it recognised the long-term potential of SMRs as an additional source of generation, so on the recommendation of NNL it has commissioned a more in-depth analysis to establish the robust evidence base needed to enable a policy decision on SMRs and help Government decide whether it wants to pursue a UK SMR programme. This analysis will look at what is needed to bring SMRs to market, and clarify the economic case.

There is already a provisionally agreed schedule which provides for one SMR design – following a selection process and subject to Government policy decisions – to potentially begin a Generic Design Assessment (GDA) in 2017. The Government is expecting one of the eight sites on the Nuclear National Policy Statement to be proposed. (5)

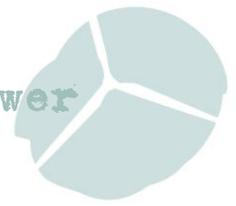
Trawsfynydd has also been suggested as a site for an SMR. According to the BBC two separate reports have suggested it could be an ideal site for a small reactor. (6)

Meanwhile the Wall Street Journal reports that using modular construction techniques for the AP1000 reactor hasn’t worked. Building nuclear reactors out of factory-produced modules was supposed to make construction swifter and cheaper, but costly delays have shaken faith in the new construction method at the two US sites. *“Modular construction has not worked out to be the solution that the utilities promised”*. The new building technique calls for fabricating big sections of plants in factories and then hauling them by rail to power-plant sites for final assembly. The



method was supposed to prevent a repeat of the notorious delays and cost overruns that marred the last nuclear construction cycle in the 1980s. It hasn't worked. Georgia Power Co., a unit of Southern Co. that is building one of the nuclear power plants, reports that construction is three years behind schedule, although it is making steady progress. (7)

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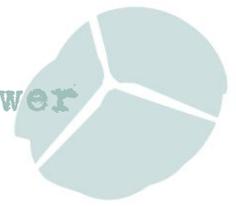


4. The worst period for environmental policy in 30 years

The Secretary of State for Climate and Energy, Amber Rudd, has been accused of “*grotesque hypocrisy*” for claiming the government is leading on climate change while overseeing a string of attacks on green policies. (1) Former FoE Director, Tony Juniper said it’s the worst period for environmental policy in three decades. (2)

Recent measures announced include:

- Subsidies for new onshore wind farms to end on the grounds that the technology should stand on its own feet and save bill payers money. Ironically onshore wind has attracted a lot of investment and can be the most cost-efficient way of producing low carbon energy.
- The early closure of the renewable obligation (RO) subsidy for solar a year early in April 2016 for schemes of less than five megawatts (subject to consultation).
- A review of the feed-in tariff, to make further significant savings in a move that could threaten state support for solar panels on domestic roof tops. The Government admitted the benefit of scrapping support for the solar industry at this stage would only save energy consumers 50p a year.
- The government also confirmed that it was removing the guaranteed level of RO subsidy for coal or other fossil fuelled-power stations which are converting to wood or another biomass fuel.
- The Government has effectively killed the Green Deal. Few will mourn the scheme, but what’s striking is Rudd has nothing to replace it with. So, apart from poorer households, who get support through the separate ECO scheme, there is now no serious energy efficiency policy for homes, which account for around a third of UK carbon emissions. A review of all remaining energy efficiency schemes is currently underway with details expected in the autumn budget.
- The Government is selling off as much as 70% of the Green Investment Bank, which was launched in 2012 to help green projects with an initial injection of £3.8bn of public money.
- Giving up on zero carbon homes: A decade-long plan to force all new homes to be ‘zero carbon’ from 2016 was binned by the Treasury. Major housing developers said the decision was “*extremely disappointing*”, a view that was echoed by planners, green groups and the designer of a new ‘carbon positive’ house that just opened in Wales. (3)
- Removal of the Climate Change Level Exemption for Renewable Energy. This imposes retrospective cuts on renewable projects already up and running across the entire clean energy sector. (4)



Rudd told the House of Commons Energy and Climate Change Committee that carbon reduction targets are a bigger priority than renewables. (5) Although she reaffirmed the government's commitment to tackling climate change, Rudd said that "*no one can see*" what the exact route to reducing emissions will be. "*The point is to make sure that we reduce our carbon emissions, and how we do it should largely be left up to us*" she said, clearly leaving the door open to missing the UK's European Union Renewable Target of meeting 15% of our energy needs (not just electricity) from renewable sources by 2020. (6)

Rudd defended the high strike price offered to the Hinkley Point C nuclear plant saying we need a secure baseload to back up "*unreliable renewables*" as part of the energy mix "*until we get storage right*". (7) Rudd also told the committee that although storage is "*a fantastic opportunity in the future*" and a "*really exciting development*", it is "*not yet a really essential part of delivering electricity*". (8)

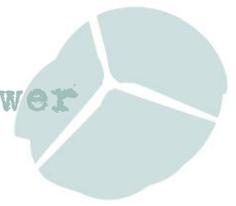
She said there is a "*very good prospect*" of an investment decision on Hinkley finally being taken later this year, despite mounting calls for the station to be cancelled. She told the Select Committee it was "*essential*" that the project goes ahead. Protracted negotiations between EDF and Government over subsidies for Hinkley resulted in a headline deal in October 2013 but details are still being ironed out, while investments from Chinese nuclear partners are yet to be finalised and financial turmoil at reactor-maker Areva has caused further problems. (9)

George Osborne's father-in-law and former energy secretary Lord Howell of Guildford told the House of Lords that the "*elephantine*" Hinkley C is "*one of the worst deals ever*" for British consumers and industry and "*by far the biggest obligation or future burden on consumers and households*". He would "*shed no tears*" if the project was abandoned. (10)

In her first major speech as Energy and Climate Change Secretary Rudd defended the cuts to renewable energy subsidies. She said that the Government's approach will keep consumer bills down and encourage businesses to innovate, grow and create employment. Unchecked climate change is a threat to growth, quality of life and the economy as a whole, but the best way to deliver a low carbon economy is by using free markets and competition, to help develop new green technologies, make them cheaper, and show other businesses the benefits of a low carbon economy. (11)

The problem is this is simply all talk, said the *Scottish Herald's* Editorial. There is no evidence the rhetoric will be backed up by policy. David Cameron insists he lived up to his 2010 pledge to lead the 'greenest government ever'. But even in coalition with the green-leaning Liberal Democrats, this was never true and since being returned with a parliamentary majority, the Conservatives have ploughed up swathes of green policy. (12)

Rudd's speech was described by RenewableUK as like "*trying to win the Tour de France on a bike without wheels*". Gordon Edge said: "*Despite the laudable ambitions expressed by the energy secretary in her speech, the current trajectory of current government policy on renewables is not an encouraging one, following their announcements on ending support for onshore wind and solar, as well as scrapping the Green Deal and the Zero Carbon Homes objective, and making punitive changes to the Climate Change Levy.*" (13)



Rudd's competition solution is to subsidise the technologies that are more expensive and undermine the technologies that have used subsidies to reduce their costs to the bill payers. A free-for-all energy market will see capital go where it thinks it can make the best (and easiest) returns in the short term, which, right now, are to the expensive but politically palatable technologies such as offshore wind and nuclear. (14) Juliet Davenport, CEO at utility Good Energy, said Rudd is right to say that bills need to be affordable, so it makes no sense to be pulling the rug from under the very technologies which can deliver both lower bills and energy security in the long term. (15)

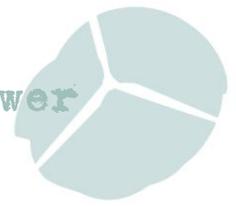
Rudd says *"we need to reduce our emissions in the most cost-effective way"*. Yet the government support package for Hinkley C has been independently costed at £76 billion (€108 billion). (16) More than 40% of DECC's budget is already spent on nuclear waste management, and yet this technology, which will take years to make a material difference to our energy security, remains favoured by government while renewable technologies that could deliver more quickly and cleanly are being undermined. (17)

Craig Bennett, chief executive at Friends of the Earth, said: *"The government's credibility on tackling climate change is hanging in tatters. Amber Rudd appears to have been wheeled out to say a few warm words on tackling climate change as window dressing for a vicious Treasury assault on the environment."* (18)

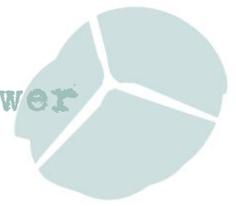
Progress in achieving emission reductions through policy and regulation has been achingly slow, says Sustainability Consultant Rory Bergin in his blog. The Committee for Climate Change says much of our current emissions reductions have come about because of the recession rather than environmental improvements. In order to achieve our Carbon Budgets we will need to decarbonise at a rate of 3% per annum. That means any new market-based solutions the Tories come up with have to be three times more effective than current policies. The Green Deal may have been flawed, but it could have been rescued with a proper finance package, instead of abandoning it entirely. Similarly the zero-carbon housing regulations were heading in the right direction and had massive support from industry, (with the usual exception of the house-builders who don't support any regulation that impacts on their bottom line) and also could have been made to work. Again this has been unceremoniously binned, sending housing regulations back to 2013, there to stay for the foreseeable future. What the Tories don't appear to understand, or are just ignoring, is that in order to create a functioning market you need investment. In order to attract investment, you need certainty, and in order to create certainty you need good governance that doesn't change the rules without consultation. (19)

Since Lord Stern has described climate change as *'the world's biggest market failure'* it is difficult to see how a market-based strategy can reliably deliver the emissions reductions needed. If we believe that the government is sincere in maintaining its carbon change objectives and its willingness to address the consequences of its own carbon budget commitments, then at some stage it will have to introduce measures to change behaviour or investment patterns that look rather like the measures they have just abandoned. (20)

In the year of COP21 Paris when the world expects the UK Government to lead on climate action and to sign up to a global deal, they could have hardly gotten off to a worse start.



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5. Government support for “Blue Crap” irrational.

The Government’s support for ideological ‘blue crap’ over rationality is putting the UK increasingly out of step with the global energy transformation that is taking place in response to climate change and technological advances that allows people to generate their own energy more cheaply than utilities can. It puts in jeopardy Britain’s ability to derive social, economic, security and environmental benefits from this transformation. (1)

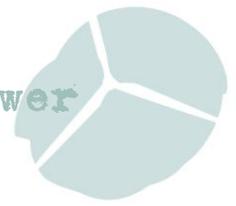
The Committee on Climate Change (CCC) wants to know what the Government intends to do to ensure its legally binding targets are met given that virtually all low-carbon measures are due to expire during its period in office? (2) Lord Deben said that if the government chooses to try meeting its legally binding carbon targets without onshore wind it must explain why it is taking a more expensive route towards decarbonisation. The CCC warns there remains a gap of around 15% between projected emission and the 2027 target, so decisions made over this Parliament will have a huge impact on the UK's progress to 2030 and beyond. Under the Climate Change Act, ministers must respond to the committee by mid-October and set out how it will meet the shortfall in renewable energy generation after the withdrawal of support for onshore wind. (3)

One of the most urgent measures which needs to be updated next year is the Levy Control Framework (LCF). The Renewable Heat Incentive, which offers payments to homeowners and business installing green heat technology, also needs to be extended from April 2016 to at least 2020 unless a suitable replacement can be found. The Energy Company Obligation (ECO) scheme should also be extended beyond 2017. The CCC is calling for an action plan that delivers low carbon heat and energy efficiency improvements so homes can be heated for less, alongside implementing the zero carbon homes targets that were progressively weakened in the previous parliament. (4) Unfortunately, since the CCC Progress Report (5) the Government has cut several schemes, which the Committee won’t have been anticipating.

The idea the Levy Control Framework (LCF) is 'bust' has been fed by shadowy briefings to the right-wing press and analysis by the likes of right-wing think-tank the Policy Exchange, according to Dr Gordon Edge of RenewableUK. The culmination of this briefing frenzy was the publication by the Office of Budget Responsibility (OBR) of a table alongside the Summer Budget which appeared to indicate that the LCF will indeed be all used up, and also the 20% 'headroom' that Treasury allows DECC. But we can’t know if the government has overspent its budget if it won't show its workings? (6)

A range of commentators including energy analysts, some academics, and politicians have long disagreed with DECC’s reassurances on the cap, arguing for a variety of reasons that the £7.6bn limit and perhaps even the 20% headroom was likely to be broken. The Office for Budget Responsibility (OBR) has now sided with the pessimists and says spending will reach £9.1bn in 2020/21.

Carbon Brief runs through the reasons. First, solar prices fell faster than expected, making subsidies relatively more generous. This has meant spending on Feed-in Tariffs (FITs) has been



growing by £160m a year, rather than the £60m a year DECC had budgeted for. The new forecast appears to put expected annual FITs increases even higher than recent growth, at £200m. It's possible this might be an overestimate: cost controls, known as degression, are in place to reduce solar support when deployment is high.

Second, in advance of the early closure of the Renewables Obligation (RO) to large solar farms in April, there was a surge in UK solar capacity and generation, up by more than 50% last year. The new forecast boosts expected spending out to 2020/21 as a result of this leap in solar.

Third, recently built offshore wind farms supported through the RO are turning out to be more productive, generating on average close to 45% of maximum capacity rather than the 38% DECC had assumed. The new forecast doesn't try to account for the early closure of the RO to onshore wind as it is unclear if it will reduce the capacity of wind that gets deployed.

Fourth, the forecast includes large increases in expected outlay on Contracts for Difference (CfD), the subsidy scheme that is replacing the RO. This reflects reduced expectations for wholesale electricity prices over the next five years, meaning the top-up CfD becomes more expensive.

It also appears to assume that two demonstration projects for carbon capture and storage (CCS) are awarded CfDs and that they will start operating before 2020. This is earlier than expected by the CCC. The new forecast may even be assuming that the planned Swansea tidal lagoon is awarded CfDs and is built within five years.

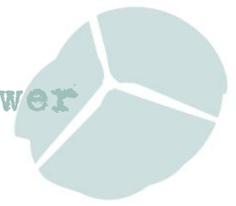
The CCC wants the post-2020 LCF to be agreed by early next year. The decision could overlap with debate over the UK's fifth carbon budget, with the CCC due to publish its advice in December. This risks tying concerns over the future costs of supporting low-carbon energy to debate over carbon budget ambition. (7)

According to the *Guardian* the projected overspend on renewables had become the single most important problem for the ministry as it tries to balance its books. Sorting this out is a number one priority. (8)

Ofgem says that "*environmental and social costs*" currently make up 7% - £89 - of the average household dual fuel energy bill. Using Ofgem figures, Policy Exchange recently broke down this £89 figure further showing that the Renewables Obligation accounts for £38 and the small-scale feed-in tariff accounts for £10. (9)

Under the Government's current projections, the total additional costs added to an average household's electricity bill to pay for the green schemes are already due to rise from £89-a-year to £188 by 2020. But if ministers continue to pursue official targets with the necessary future investment, this figure will rise significantly. A new analysis by the Policy Exchange suggests that the current overspend on renewables subsidies alone could add an additional £20, pushing energy policy costs for the average household to nearly £210 per year. (10)

The Policy Exchange Report – The Customer is Always Right (11) – recommends maintaining carbon budgets by ditching renewable energy targets and resisting calls for a 2030 power sector decarbonisation target. It also wants to focus decarbonisation efforts on mature, low cost generation technologies. It says the new 'Contract for Difference' auction model for renewables



subsidies has been a success, and should be the focus going forward, with the bulk of funding allocated to mature technologies. New nuclear should be procured on the basis of competition between the various suppliers and technologies available, rather than a bilateral negotiation with one supplier.

Policy Exchange says the Government should ditch expensive technologies which show no sign of cost reduction to fail, rather than continuing to prop them up with large subsidies. There should be a cap on the level of support under *any* subsidy mechanism, which we suggest should initially be set at a 'net subsidy' of £70/MWh (7p/KWh), with a clear downward trajectory. The Feed in Tariffs for micro renewables such as rooftop solar are excessive, and should be cut significantly to stem the increase in policy costs.

The report has been criticised by Lord Turner of Ecchinswell, the former chairman of the Committee on Climate Change: *"The government should certainly strive to achieve decarbonisation at the lowest possible cost, but its focus must be on costs over the medium and long term. The Policy Exchange report, by contrast, is in danger of taking too short term an approach."* (12)

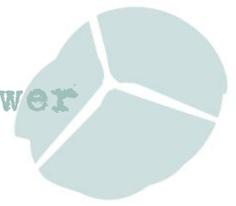
Dr Gordon Edge says so far, up to 2014/15, it doesn't look like the LCF has been overspent, let alone reached the 20% headroom. The growth projections for the RO set out by government last autumn might be a bit on the low side, but not outrageously so; only a certain amount of CfDs have been given out so far; the feed-in tariff has overspent but there is a wholesale review about to start which could limit further growth. There are also a number of detailed technical areas that, depending on what is assumed, could lead to a considerable reduction of spend against the LCF envelope. But we don't know in detail what is being assumed when unnamed sources speak to the press.

What we need is a review of the LCF to see if it is adequate to meet our legally binding targets for renewables. It needs to be used in a way which promotes confidence that development will not be stopped arbitrarily, but also to avoid some of the pitfalls that have been revealed by the operation of the LCF to date –by, for instance including some form of 'automatic stabiliser' to account for the impact of falling power prices, recognising the fact that the consumer benefits overall from such falls. Such a review is essential to restore confidence in the mechanism, before we can talk meaningfully about what happens post-2020 to meet our longer-term decarbonisation ambitions. (13)

Ministers could start the process by recognising that a well-managed £9.1bn (£7.6bn + 20%) investment programme carefully tailored to support cost-effective clean energy technologies that are genuinely close to standing on their own two feet is not just good value, it is essential to the UK's long term health and prosperity in a decarbonising world. (14)

Juliet Davenport, chief executive of Good Energy, which already owns six solar farms and supports over 90,000 domestic solar installations, points out that solar met 15% of UK electricity demand on the afternoon of Friday 3rd July. With continued support over the next five years *"solar would soon be one of the cheapest forms of electricity generation."*

And contrary to government statements, she says it's already saving consumers money: *"Our research shows that solar reduces wholesale prices by displacing high cost gas fired power*

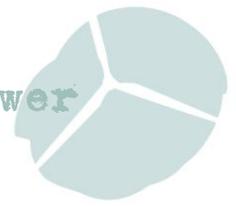


generation during the day - the government is taking a one-sided approach by not taking this into account."

Last month the Solar Trade Association published its 'Solar Independence Plan for Britain' report, a fully costed proposal which sets out how the UK can double the amount of solar and get solar as cheap as fossil fuel electricity by 2020 - all for a modest amount of extra funds. Its 'Higher Ambition' scenario would allow the delivery of 25GW of solar capacity by 2020, comprising over two million solar homes, 24,000 commercial rooftop and community schemes, and around 2,000 solar farms.

In 2020 the plan would provide 56,900 jobs at an average cost on consumer bills of just £13.35 per year. And even more important it would guarantee 'grid parity' in that same year – meaning that no new subsidies would be required for any solar projects in the UK. (15)

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6. Hinkley Notes

Austria has filed its legal challenge to the UK's €108 billion support package for the Hinkley Point C nuclear plant. The Constitutional Law Department of Austria's Federal Chancellery submitted the lawsuit which calls for the annulment of the Commission's decision that the UK government's subsidy is lawful.

"State Aids are there to support new and modern technologies that are in the general interest of all EU countries", said Federal Chancellor Werner Faymann. "In no way is this is true of nuclear power!"

In particular, Faymann denies the Commission's reasoning that the aid would contribute to the promotion of an industry: *"The state-guaranteed purchase price for a period of 35 years, Britain's state credit guarantee of up to £17 billion and the compensation in case of early closure of the plant all, in our view, contradict the requirements for a state aid approval."*

Even if nuclear energy contributed to the UK's 'decarbonisation', he added, it is undisputed that the overall environmental impact of nuclear power plants is negative. *"Therefore, the generation of nuclear power in preference to renewable energy sources is outside the terms of the Commission's environmental and energy aid guidelines."*

"Nuclear power plants are dangerous, expensive, and compared to future technologies such as wind, water or solar energy neither economically nor ecologically competitive", he stressed. (1)

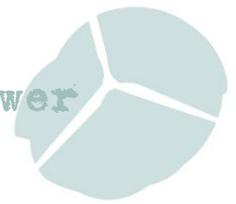
Austria's environment minister, Andrä Rupprechter, said nuclear energy was no longer able to survive economically and should *"not be artificially resuscitated through state subsidies"*. *"Instead of funding unsafe and costly energy forms that are outdated, we have to support Europe's energy turnaround with the expansion of renewable energies," he said. (2)*

An alliance of 10 German and Austrian renewable energy suppliers, including Greenpeace Energy, is also taking legal action against the state aid awarded to Hinkley

A new study commissioned by the group shows that approval for Hinkley C, together with other proposed nuclear power plant projects in Europe, *"could distort prices in Germany's electricity market by up to 12% and thereby massively distort competition."* In effect, they say, the heavily subsidised nuclear plants would have to 'dump' excess power on European power grids, forcing prices down and reducing the viability of clean power generation from renewable sources, also costing German taxpayers some €2.2 billion per year in additional support payments for renewable energy by 2040.

"If the State Aid model in Britain becomes accepted - and there are strong signals coming from Poland, the Czech Republic and Hungary on this - then it looks very bleak for Germany's energy transition and decentralised energy supply", says Dr Achim Kötzle, executive director of energy management at Tübingen's municipal utility.

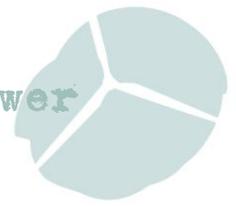
The Commission's approval would send a *"lasting negative signal"* to renewable generators and investors across Europe, he adds. *"The European Commission's decision threatens to have negative consequences for our environmentally sound production plants."*



Dr Dörte Fouquet, partner at the international law firm Becker Büttner Held, who is representing the Action Alliance, believes the decision to approve the UK state aid to nuclear power was both wrong in law, and "*not in the common interests of the European Union.*" For instance, the Commission ignored the fact that there was no tendering procedure for Hinkley Point C; "*the Euratom Treaty, which the Commission relied on for its argumentation, does not substantiate State Aid*"; the Commission applied an incorrect evaluation benchmark because these British subsidies are a 'State aid' and not an 'investment aid'; and "*there is no general failure of the energy market which could justify these proposed subsidies.*"

DECC and EDF are in talks over who will pick up the costs if Austria or the renewable companies win the appeal. Although the Government and EDF both insist the appeal has no merit, it is understood they are yet to agree on what would happen in the unlikely event Austria does win. Speaking on the fringes of the Nuclear Industry Association's annual conference, Ms Leadsom confirmed that the Government was "looking very closely" at the issue of how the project could go ahead with a state aid challenge ongoing. Austria's state aid appeal is likely to hang over the project for at least a year and potentially as long as six years – during which time billions of pounds would be spent on construction. (3)

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7. Slow Progress on Plutonium Stockpiles.

Since the Government confirmed in December 2011 that its preferred management option for the UK's plutonium stockpile was to convert the 'asset of zero value' into Mixed Oxide (MOX) fuel, further progress on the option has been conspicuous by its absence, says Cumbrians Opposed to a Radioactive Environment (CORE). (1)

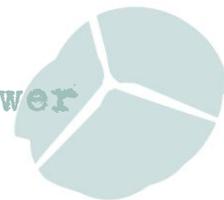
Since then the Nuclear Decommissioning Authority (NDA) appears to have been concentrating its efforts on evaluating alternative projects – the GE Hitachi PRISM reactor and the Candu Energy Canmox project. Both these projects were added to the list of plutonium options as an afterthought in January 2012.

In June it was reported the Canmox scheme had emerged as a front-runner among the options under consideration and had taken a step forward with the signing of an agreement between the Canadian Government and the NDA to enhance cooperation in civil nuclear energy. Ontario-based Candu Energy is proposing to turn plutonium into mixed oxide (MOX) pellets at a dedicated fabrication facility at Sellafield. The MOX fuel could then be used in four thermal reactors to produce up to 3GWe of electricity. Canmox claims to be able to deal with the entire stockpile of plutonium, regardless of the grade or contamination. The distinguishing feature of the Candu technology is the use of heavy water as a moderator that provides enhanced neutron efficiency, allowing for fuel flexibility. According to Candu Energy: *"The arrangement galvanizes joint research and development, regulatory co-operation, technology transfer and investment into the UK nuclear sector and has the potential to unlock a powerful energy source for UK electricity consumers."* (2)

A press release from AREVA on 6th July about opening a new office near Sellafield confirmed its support for the AREVA Convert Project. This is a plan to build a new facility at Sellafield to transform the UK's plutonium stockpile into MOX fuel which *"could create 2,000 construction jobs and mobilise around 1,000 full-time employees to support operations and maintenance of the future plant."* (3)

This hitherto unknown project is geared to converting *'the nuclear material that is a potential liability (Sellafield's plutonium) into a valuable fuel to help meet Britain's low carbon power generation needs'*. In more detail, the project is described as a full lifecycle solution including the design, construction, operation and decommissioning of a MOX plant in West Cumbria which would produce MOX fuel for use in 'UK's planned fleet of new generation nuclear reactors'. (4)

No projected cost for a new MOX plant is given by AREVA (the last estimate by the Nuclear Decommissioning Authority in 2011 was around £6bn) and no mention is made of the French company's ongoing new-build reactor fiascos in France and Finland, its financial losses that have forced its merger with state controlled EDF, its involvement with the spiralling costs and decades of delay to the AREVA design MOX plant under construction in the USA at Savannah River and - as part of the disgraced Nuclear Management Partners (NMP) consortium at Sellafield - its recent stripping of a multi £billion management contract by the NDA following spiralling budget costs and inept management of crucial projects.



In a further twist to the plutonium management options currently under NDA assessment it has been reported that 'GE Hitachi Nuclear Energy Canada is working with Candu Energy to develop the CANMOX approach'. As GE Hitachi is already behind the proposal to use its PRISM fast reactor at Sellafield, it is clearly hedging its bets by being involved in two separate and technically very different projects to 'get rid' of the 140 tonnes of plutonium expected to have arisen at Sellafield once reprocessing operations have ended around 2020. Both projects (PRISM and Candu) will now have to compete with AREVA's MOX proposal – and the possibility that all of the plutonium re-use options could yet be jettisoned in favour of immobilising plutonium as waste. (5)

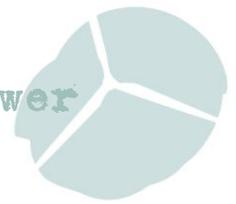
Now the Environment Agency and the Office for Nuclear Regulation have been tasked by the NDA to review the option of immobilizing plutonium. The NDA says research work on the immobilization of plutonium is being carried out to find out if the process can be "industrialised" so that it could be used to treat material that is unsuitable for reuse or for disposition of the entire stockpile if Government decided not to pursue re-use. Until now, research on the immobilization option has been specifically targeted at the treatment of the small proportion of stockpiled plutonium termed as "residues" and considered through chemical contamination to be beyond re-use.

The immobilization option currently being funded by the NDA and researched by the National Nuclear Laboratory (NNL) is the Hot Isostatic Pressing (HIP) process which, under high pressure and temperature, converts the plutonium into a ceramic waste form suitable for long-term storage and ultimate disposal. Though the HIP process for Sellafield's residues has taken preference to other immobilization technologies including immobilization in cement-based grouts, as glass via vitrification or as a ceramic in "low specification" MOX, the NDA's Plutonium Credible Options Analysis published in 2010 concludes that whilst the HIP process is technically immature for large scale bulk plutonium, it requires less development and is economically more favourable than the vitrification option.

A pilot plant for the immobilization of plutonium residues at NNL's central laboratory at Sellafield is expected to start active commissioning in 2017. The process is described by NNL as *"a powerful emerging technology that offers a route for the immobilisation of orphan waste streams and also has the potential to meet wastefrom requirements for future nuclear fuel cycles"*.

Flagged up for spring this year, a Government policy announcement on plutonium management never materialized and there is currently no indication as to when such an announcement will now be made. No date has been provided for the completion of the Regulators' review of the immobilization option. (6)

Meanwhile it has been announced that the UK is taking ownership of about one tonne – 800 kg and 140 kg, respectively – of material previously owned by a Swedish utility and a German research organisation, avoiding the cost and security measures associated with transporting the fuel back to other countries. DECC said in April 2013 that it would take over 750 kg of plutonium belonging to German utilities, 1850 kg previously loaned from France, and 350 kg from Dutch firm GKN. At the same time, 650 kg of plutonium stored at Sellafield was transferred from German to Japanese ownership. A similar deal with Germany in 2012 saw the UK take ownership of four tonnes of plutonium. (7)



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