nuClear news

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1. Europe approves massive nuclear subsidies

The Stop Hinkley Campaign was amongst those who expressed extreme disappointment after European Commissioners decided to approve subsidies of up to £17.6 billion to EDF Energy to build two new nuclear reactors at Hinkley Point in Somerset. (1)

Stop Hinkley Spokesperson Allan Jeffery said: "*This deal is clearly illegal under European law; it will saddle UK consumers with the bill for paying huge subsidies for decades, and yet there are more cost effective and safer ways of providing low carbon electricity or not using the energy in the first place. It is mind boggling how the UK government managed to convince the Commissioners to go along with this crazy plan without even the pretence of a competitive process."*

But the group vowed to continue its campaign to halt the £16 billion project. It said the Government should examine in detail the flurry of recent reports from investment and energy analysts predicting a bright future for solar energy and other renewables as well as energy storage.

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

Brussels analyst, Mark Johnston says the Competition Commissioner has lost any rational argument on the Hinkley state aid case. It is clear that single market and competition rules, environmental protection goals, and even general treaty principles such as consistency and continuity have all been set aside. Compatible state aid can only be "*necessary, proportionate and time-limited*", but Hinkley aid is none of these. Creeping regulatory and governance failure is allowing industry players such as EDF to milk policy and rule-making to their own advantage. (2)

The European Photovoltaic Industry Association (EPIA) said Competition Commissioner Almunia clearly had concerns about the State Aid application so his apparent intention to backtrack is totally inappropriate and worrying. Such a decision, made without adequate evaluation and scrutiny of the project, will constitute a disaster for the internal energy market and achieving the objective of enhanced competition in the energy sector. "*How can the European Commission ask renewables to integrate in the energy market, while at the same time validating another subsidy to nuclear*?" queried James Watson, EPIA CEO. "*EPIA previously raised concerns about the State Aid rules as they force renewables to integrate into a market that is not yet designed for them. We need new energy market rules that allow for a cost-effective energy transition, not £17bn subsidies for nuclear power*," he added. In just a few years, solar has experienced an impressive cost decline thanks to economies of scale and innovations, decreasing its reliance on financial support as it becomes cost competitive. The International Energy Agency estimates that by 2050 the cost of solar technology could decrease by another

65%. Nuclear, however, despite decades of public support, still seems to rely on expensive, long-term, guaranteed subsidies to be economically viable. While subsidies to the Hinkley project would cost as much as €112/MWh in 2023 (when the plant is expected to start operating), the cost of supporting solar in Germany is already 34% cheaper (€73/MWh last year) (3)

Andrea Carta, Greenpeace's EU legal adviser, said: "*This is a world record sell-out to the nuclear industry at the expense of taxpayers and the environment. It's such a distortion of competition rules that the Commission has left itself exposed to legal challenges. This is a bad plan for everyone except EDF*." (4)

Nick Butler, writing in the FT said the obvious losers are the UK's consumers who are trapped into paying a price for electricity that is double the current wholesale price for 35 years after the plant starts up. It is not clear, however, whether EDF can be classified as a winner. Although it ably made the argument that nuclear is safe and relatively clean, the French utility has lost public confidence by doubling the price of electricity from that quoted to the last government without properly and publicly explaining its decision. There is also the non-trivial problem of construction. The two European Pressurised Reactors (EPRs) that are currently being built in Europe are years behind schedule and billions of euros over budget. Can Areva, which is in deep trouble, fund its 10% share? And on what terms will the Chinese sign up? The nuclear industry as a whole is a loser as things stand. With the prices of oil, coal and natural gas falling, nuclear has a limited future if this is the best price the industry can offer. The deal carries the air of being the last hurrah of an old order within which energy deals were done on the assumption of ever-rising prices. (5)

The Austrian Government has declared its intention to take the Commission to the European Court of Justice over this decision, (6) and Germany is also considering it. (7) In the UK independent energy supplier Ecotricity is also among companies and organisations considering a legal challenge. There appears to be a groundswell of opinion among renewable energy companies and associations in Britain and Europe that something should be done. (8) This could leave the project in limbo. Legal action would take at least a year to conclude and EDF Energy would have to decide whether or not to risk proceeding with the project in the meantime in case it has to be abandoned if the legal action is successful. It seems very unlikely that a final investment decision will be taken before the 2015 General Election.

Scottish Energy Minister, Fergus Ewing says subsidies for nuclear power will "inevitably" mean less financial support for green energy, and support for nuclear power is harming investment in renewable energy projects. Offshore wind projects in Scotland for instance are not receiving enough financial support from the government in Westminster, despite being "extremely valuable" to Scotland's economy and its efforts to reduce its carbon emissions. There is only around £235m of financial support available for renewable projects in "*stark contrast*" to the "*unprecedented financial backing*" for Hinkley. (9)

Given there's only so much money to go round, if nuclear power is allowed to grab a huge share of the UK's energy finance pot this will seriously diminish the funds available to develop the renewable energy revolution. An analysis by Dave Toke, reader in Energy Policy at Aberdeen University, suggests that spending on Hinkley Point C and later nuclear reactors will obliterate spending on renewables. The levy control framework (LCF) is a device used by the Treasury to

limit subsidies to different forms of energy levied on consumers' bills. Consumers will probably be paying around £1bn every year after 2023 to subsidise Hinkley, which, barring any changes to the LCF, means there won't be any further money available for subsidies until 2027, by which time Sizewell C could be ready to start gobbling up subsidy money. (10)

Paul Dorfman of the Energy Institute at University College London says at least we now know that this is indeed a subsidy paid for by public money. The UK Government had contrived a position, by which they argued that the support for Hinkley C would not be a subsidy if it was also available to other low carbon technologies, including of course renewables. But the subsidies the UK is determined to dole out with such largesse to EDF are not available to renewable energy. In particular renewable energy support contracts typically last for 15 or 20 years - compared to the 35-year contract on offer to EDF. A number of pan-European and UK energy associations, corporations and small companies will be significantly - and negatively - affected by this decision. This state aid will distort the UK and European energy market. In any case, subsidies should not be provided to a mature technology like nuclear power - a point argued by the Commission in its original report. So a legal challenge through the EU Court of Justice is likely. (11)

Doug Parr of Greenpeace calculates the total (undiscounted) subsidy to Hinkley over its lifetime would be £37bn, which means a £14 increase per household per year. The Chief Technology Officer at Siemens has said that renewables developers would 'give an arm and a leg, at least' for the kind of terms being offered to nuclear in UK - yet even so, some renewables will be cheaper at a headline level than nuclear by the time Hinkley opens in 2023 at the earliest. But most of the support for Hinkley is not available to low carbon generators like renewables, or not available at the same rate. For example onshore wind will have a lower 'strike price' than Hinkley from 2017, and will in any case now be subject to competitive bidding processes which would lower the price further, unlike the Hinkley project. And Hinkley's 35-year strike price contract means someone leaving school now could still be paying for this contract after they retire. (12)

For Friends of the Earth Craig Bennett called it a shameful decision by the European Commission. "*But the overwhelming sentiment felt by many who have watched this saga is just how extraordinarily disingenuous the advocates of new nuclear have had to be to get this far; and what a shockingly bad and expensive deal it is for the British taxpayer and energy bill payers. As the madness of the Hinkley deal unravels over the next few years – as it surely will – it will sit very badly alongside Ed Miliband's promise of an energy price freeze, and Caroline Flint's recent and very welcome promises to tacking the scandal of fuel poverty through energy efficiency schemes. It's been estimated, for example, that the vast majority of homes in the country could be brought up to Energy Performance Standard C, supported by interest free loans to householders, at a cost to the taxpayer of just over £2billion per annum. This would make a real different to the health and wealth of millions of low income households. The Hinkley deal, in contrast, takes money away from these same households and gives it to EDF – for the next 35 years."* (13)

Despite welcoming the Hinkley deal Shadow energy minister Tom Greatrex has called on the National Audit Office to review the subsidy arrangement for the nuclear project. (14) Labour has never said that if it wins the General Election next year that it would stop new reactor construction after Hinkley. But in writing to the National Audit Office and the public accounts

committee asking them to review the subsidies, and to investigate whether further concessions could be secured: "*to ensure that consumers are getting the best possible deal in the construction of Hinkley Point C*", Labour appears to some to be threatening to unpick the deal. The Times said if a future Labour government backs changes to the deal, EDF could be forced to review something that has taken more than two years to resolve. (15)

Why does Labour's shadow energy and climate change minister, Caroline Flint MP, support the subsidy package, asks Donnachadh McCarthy former vice chair of the Liberal Democrats, having stated that she would only support nuclear power if built without public subsidies? His theory is that it's because the nuclear industry has poured millions of pounds year after year into a massive political lobbying campaign. A complex web of financial interests ensured that the Labour government served the nuclear industry - no matter what Labour party members or the British public wanted. (16)

The National Audit Office has indeed begun an investigation into the subsidy regime for Hinkley. It will be checking whether the guaranteed price of £92.50 a megawatt hour – double the current cost of electricity – represented "value for money". The NAO move follows pressure from the House of Commons Environmental Audit Committee. (17)

The Stop Hinkley Campaign welcomed news that the National Audit Office (NAO) has begun an investigation. Stop Hinkley Spokesperson Allan Jeffery said: *"This is an extraordinarily bad deal, locking consumers into high prices until almost 2060. Worse still it will use up most of the money available to subsidise non-fossil fuel energy leaving almost nothing available for renewables at a time when their costs are plummeting".* (18)

Meanwhile, George Osborne was criticised by the European Commission for failing to reveal all the costs associated with Hinkley. Buried deep in commission minutes from 8 October is an admission that there was "*regret, expressed by some, that all the long-term costs for the British Treasury had not been integrated into the calculation of the cost of the project, for instance the cost of storing the nuclear waste or of dismantling the plant at the end of its lifetime*". Dr David Lowry, a research consultant and member of Nuclear Waste Advisory Associates, warned that nuclear costs "*always escalate*" and added: "*When ministers and political atomic aficionados back the nuclear industry's claims that they have covered all future costs for long-term radioactive waste management, they have fallen into a clever trap.*"A Treasury spokesman said: "*With respect to the decommissioning and storage costs the situation is that* [EDF subsidiary] *NNBG are responsible for these long-term costs (through their investment in a Funded Decommissioning Plan), and these costs are all included in the agreed strike price. It is a pity that the minutes do not reflect this*." (19)

What the Treasury doesn't say is that the so-called "waste transfer pricing scheme" means that there will be a cap on waste costs for the nuclear plant operator, EDF. If costs escalate above this cap – and the long-term experience of the nuclear industry shows that costs always escalate – then the top-up costs will fall once again to the taxpayer. (20)

1. Stop Hinkley 8th Oct 2014 http://www.stophinkley.org/PressReleases/pr141008.pdf
2. Mark Johnston 3rd Oct 2014 http://markjohnston.org/2014/10/03/hinkley-3/

3. PV Magazine 3rd Oct 2014 http://www.pv-magazine.com/services/press-releases/details/beitrag/hinkley-point--the-commissions-credibility-is-at-stake_100016666/
4. FT 8th Oct 2014 http://www.ft.com/cms/s/0/372216e6-4ec0-11e4-b205-00144feab7de.html
5. FT 8th Oct 2014 http://blogs.ft.com/nick-butler/2014/10/08/hinkley-point-the-nuclear-winners-and-losers/
6. Times 7th Oct 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4229029.ece
7. Montel 9th Oct 2014 http://www.montel.no/StartPage/SubPage.aspx?id=549518
8. Guardian 12th Oct 2014 http://www.theguardian.com/environment/2014/oct/12/ecotrcity-legal-challenge-eu-hinkley-point-c-subsidy-nuclear
9. Building 13th October 2014 http://www.building.co.uk/communities/sustainability/scottish-minister-nuclear-subsidies-hurting-green-energy/5071430.article
10. Dave Toke's Blog 13th Oct 2014 http://realfeed-intariffs.blogspot.co.uk/2014/10/hinkley-c-deal-likely-to-wipe-out-uk.html
11. Ecologist 8th Oct 2014 http://www.theecologist.org/campaigning/2587107/hinkley_c_gets_the_goahead_but_will_it_prove_a_dodgy_nuclear_deal_too_far.html
12. Energy Desk 8th Oct 2014 http://www.greenpeace.org.uk/newsdesk/energy/analysis/comment-why-hinkley-bad-deal-uk-consumer
13. Left Foot Forward 9th Oct 2014 http://leftfootforward.org/2014/10/hinkley-point-a-shockingly-bad-deal-for-the-british-taxpayer/
14. Utility Week 13th Oct 2014 http://www.utilityweek.co.uk/news/labour-calls-for-scrutiny-of-hinkley-deal/1060952
15. Times 13th Oct 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4234474.ece
16. Ecologist 9th Oct 2014 http://www.theecologist.org/blogs_and_comments/commentators/2587477/nuclear_power_trumps_democracy.html
17. Guardian 16th Oct 2014 http://www.theguardian.com/business/2014/oct/16/hinkley-point-c-subsidy-national-audit-office-nuclear-plant
18. Stop Hinkley 17th Oct 2014 http://www.stophinkley.org/PressReleases/pr141017.pdf
19. Independent 27th Oct 2014 http://www.independent.co.uk/news/business/news/treasury-rebuked-by-eu-over-hidden-nuclear-costs-9819900.html
20. Independent 28th Oct 2014 http://www.independent.co.uk/voices/letters/letters-hs2-must-not-be-developed-in-isolation-9821818.html

2. Economically Insane – Notes from Old Centralised Energy

The European Commission has estimated that Hinkley Point C will costs £24.5bn, significantly more than first thought at £16bn. EDF had originally put the cost at £16bn, of which £14bn was expected for construction and £2bn for development. It is understood the £24.5bn relates to the overall financing pay-back cost. (1) The commission admitted that in a "worst case" scenario, the total cost of what will be Europe's largest infrastructure project could hit as much as £34 billion, if the project suffered huge cost overruns and delays similar to those experienced in the construction of the Flamanville reactor. (2)

Policy makers and energy executives elsewhere will be closely watching Hinkley as a test case of whether new nuclear plants can be built in the West given the high costs and environmental risks. To share in the costs, EDF has said it wants to bring in two Chinese state-backed companies, the China General Nuclear Corporation and the China National Nuclear Corporation, and, potentially, other investors. Despite the problems other European countries now considering new reactors include Bulgaria, Hungary, Romania, Lithuania, Poland, Finland, Slovakia and the Czech Republic. "*Any other countries in the E.U. that want nuclear power will take heart from this decision*," said Antony Froggatt, a nuclear analyst at Chatham House, a London-based research organization. Greenpeace's Jan Haverkamp said: "*the chance to funnel large sums from state coffers and consumers' pockets to these megalomaniac pet projects will cause frantic activity in those countries where old, centralised energy systems are still popular with politicians*". (3)

Mark Johnston, a senior adviser to the European Policy Center, a research organization in Brussels, said the opposition to the Hinkley Point decision by a number of countries, which appeared to include Austria, Denmark, Slovenia and Luxembourg, showed that scepticism about the project had different strands. "*Austria is against nuclear power, full stop*," said Mr. Johnston. "*But some of the others don't like the idea that market disciplines are broken to fund nuclear construction, while others may worry that fewer emissions in Britain will just make coal cheaper for other parts of Europe like Poland, and do little to reduce greenhouse gases overall*." (4)

Cambridge nuclear engineer, Tony Roulstone, has cast doubt on whether Hinkley can ever be constructed. He says the EPR design is very safe but the complexity means it is extraordinarily difficult to build. This type of reactor is 'unconstructable'. Areva, the French company that owns the EPR design, is no longer actively selling power stations of this type. In those countries still looking to expand nuclear power, such as Saudi Arabia, China and Turkey, Areva is now pushing an alternative reactor. In China, where several EPRs are currently being constructed, the authorities have indicated that they will not use the design for future power plants. In other words, the Hinkley design is already regarded as a failure by those with most knowledge of it. In Finland and in Normandy, where the EPR is already under construction, delays of several years and enormous cost overruns are crippling the projects. By focussing on the increasingly unpopular EPR design, Britain may have saddled itself with an unmanageable and hugely

expensive construction project that will sour the prospects for all other nuclear technologies for another generation. (5)

Keith Barnham, Emeritus Professor of Physics at Imperial College London, says no sane investor will commit to investing in Hinkley Point C until one of the two EPR prototypes is working, which will be in 2016 at the earliest. And by then it might be even clearer than it is now that we don't need it. In 2013 the UK had over 14 GW of solar photovoltaic (PV) and wind power connected to the grid. This is already *nine times* the power of the first 1.6 GW reactor proposed for Hinkley Point, which is not expected to contribute electricity until 2023 at the earliest. Even more significantly, over the past seven years, installations of PV, onshore wind and offshore wind power in the UK have all been increasing exponentially. (6)

- A consultation on the Horizon Nuclear (Hitachi-GE) pre-application proposal to build an ABWR new nuclear reactor at Wylfa, Anglesey has been launched. Responses need to be sent by 8th December. The Nuclear Free Local Authorities' response is available here: http://www.nuclearpolicy.info/docs/nuclearmonitor/NFLA_New_Nuclear_Monitor_No36.pdf

1. Construction News 8th Oct 2014 http://www.cnplus.co.uk/news/sectors/infrastructure/energy/hinkley-point-c-construction-costs-soar-to-245bn/8670753.article
2. Times 9th Oct 2014 http://www.thetimes.co.uk/tto/business/industries/utilities/article4231296.ece
3. Greenpeace 9th Oct 2014 http://www.greenpeace.org/international/en/news/Blogs/nuclear-reaction/the-european-commissions-nuclear-decision-thr/blog/50928/
4. New York Times 8th Oct 2014 http://www.nytimes.com/2014/10/09/business/international/eu-approves-plan-for-new-nuclear-power-station-in-britain.html
5. Carbon Commentary 22nd Oct 2014 http://www.carboncommentary.com/2014/10/22/cambridge-nuclear-engineer-casts-doubt-on-whether-hinkley-point-epr-nuclear-plant-can-be-constructed/
6. Ecologist 15th Oct 2014 http://www.theecologist.org/News/news_analysis/2592833/hinkley_c_will_cost_britain_dear_if_its_ever_built.html

3. Decentralised Energy Marches On

Over the last year a series of reports from financial and energy analysts have concluded that, amongst other things, conventional utility models are no longer fit for purpose. The reports highlight the changes to the old centralised utility model which are on the horizon and the importance of new technologies. They suggest that decentralised energy supply will be increasingly important in the future. A selection of these reports is listed below:

UBS 20th August 2014 Will Solar, batteries and electric cars re-shape the electricity system?	**UBS** declares it is "***time to join the* [solar] *revolution***". Large centralised power stations could be obsolete with 10 - 20 yrs, because they are too big, inflexible, and "*not relevant*" for future electricity generation, according to the bank.	http://tinyurl.com/qxqf2j2
HSBC – Energy Storage, Power to the People	Conventional generators will be the biggest losers from an upcoming **energy storage boom**, as both consumers and grid operators look to battery and other storage technologies.	Reported in Renew Economy 1 Oct 2014 http://tinyurl.com/kgj246n
Citigroup	Energy storage will have a profound impact on traditional, fossil energy sources, with coal, oil, gas all affected. Citigroup expects the cost of batteries storage to fall significantly. By 2020, it predicts solar and battery storage will reach "socket parity" in some countries.	Renew Economy 3rd Oct 2014 http://tinyurl.com/nm3y76s and http://tinyurl.com/o3ca63x
Citi Research 28 July 2014. Energy 2020: The revolution will not be televised as disruptors multiply	"We predict that solar, wind, and biomass continue to gain market share from coal and nuclear into the future".	http://tinyurl.com/lsz8nf9
IPPR, 8th Sept 2014. A new approach to electricity markets: How new disruptive technologies change everything.	The UK's electricity system, and the policy framework underpinning it, is holding back innovation and cost-reduction because it is propping up a large-scale, centralised utility business model that is fast becoming obsolete.	http://tinyurl.com/ok7a5g8

Citibank	The **big six** energy suppliers are **facing the loss of a quarter of their customers** over the next six years.	Reported in The Guardian 1st Oct 2014 http://tinyurl.com/pcolxmz
Barclays	The disruptive impact solar power is having on traditional utilities was highlighted, after Barclays downgraded the US power sector over fears it will struggle to compete with increasingly low cost renewable energy.	Reported in Business Green 30th May 2014 http://tinyurl.com/nakrrhm
Centre for Economics and Business Research	With a stable policy, large-scale solar projects are on track to becoming the cheapest way to generate electricity in the UK. bold Government action to back British solar could create 60GW of generation capacity by 2030 – enough for 18 million homes – and support 50,000 jobs across its supply chain.	Reported in Business Green 25th September 2014 http://tinyurl.com/n8hp3yd
International Energy Agency, Press Release 29th Sept 2014	Solar Power could become the dominant source of power by 2050.	http://tinyurl.com/k37u5yo
Exeter University, Energy Policy Dept. Governance and Disruptive Energy System Change. Sept 2014	Annex 1 gives a table of 11 investment bank reports	http://tinyurl.com/obdpwyg

4. Reactor Reliability

National Grid says that the country has enough electricity generating capacity to meet the average maximum need over the course of a UK winter. But this calculation critically depends on the reliability of power stations as well as an accurate assessment of the true generating capacity of each plant. Chris Goodall looks at National Grid's assumptions on power station availability over the next few months. National Grid has raised its assessment of the nuclear fleet's availability, and by more than any other major type of power station. It predicts that 90% of the UK nuclear capacity will be working at the point of maximum demand, up from 84% last year. (1)

In the face of repeated unplanned shut downs at EdF's plants this year, there seems to be absolutely no reason for this enhanced optimism. Ofgem estimates only an 81% availability and this predates the unplanned closures at Hartlepool and Heysham 1. Goodall looked at the performance of the UK's nuclear fleet from early December to mid-February this year. It only achieved 90% output for a couple of days.

Heysham 1 and Hartlepool have been shut down since August because of safety fears following the discovery of cracks in a boiler structure at Heysham. Although the reactors are likely to be returned to service between 9th November and the end of the year, they will only operate at 75-80% of their usual output in order to prevent high temperatures causing further cracks. The power output could be curbed for up to two years. (2)

	Taken Offline	**Returned**	**Reason**	
Dungeness B unit 1			Nominal full load. 491MW	http://tinyurl.com/plnsued
Dungeness B Unit 2	September 19th	October 2nd		http://tinyurl.com/mrvbqdo
	October 13th	October 21st (expected)	Fault in main boiler feed	http://tinyurl.com/ksjkb8g
		Now expected 7th November	Fault in main boiler feed	http://tinyurl.com/plnsued
Hartlepool Unit 1	11th Aug	22nd November	Boiler Inspection	http://tinyurl.com/ooupezj
Hartlepool Unit 2	11th Aug	9th Nov 2014	Boiler Inspection	http://tinyurl.com/ooupezj
Heysham 1 Unit 1	11th June	31st Dec 2014	Boiler Inspection	http://tinyurl.com/puf88aq

Heysham 1 Unit 2	11th Aug	9th Nov 2014	Boiler Inspection	http://tinyurl.com/puf88aq
Heysham 2 Unit 1			Nominal full 617MW	http://tinyurl.com/qzr3nwp
Heysham 2 Unit 2			Nominal full 589MW	http://tinyurl.com/qzr3nwp
Hinkley Point B Unit 1			Nominal Full 493MW	http://tinyurl.com/nzyrqde
Hinkley Point B Unit 2			Nominal Full 489 MW	http://tinyurl.com/nzyrqde
Hunterston B unit 1			Nominal Full 487MW	http://tinyurl.com/lgwghpr
Hunterston B Unit 2	August 1st	October 8th	Periodic maintenance – graphite brick cracks discovered.	http://tinyurl.com/k3q9nzn
		Nov 3rd	Actual return to service, now 481MW	http://tinyurl.com/lgwghpr http://tinyurl.com/punvuno
Sizewell B	October 17th	Expected back around 24th Nov	Planned re-fuelling	http://tinyurl.com/ksjkb8g http://tinyurl.com/puvxu6x
		Turbine 1 expected 8th Dec. Turbine 2 24th Nov		http://tinyurl.com/pxo2jos
Torness Unit 1			Reduced load due to tidal conditions 509MW	http://tinyurl.com/ossjp2s
Torness Unit 2			Reduced load due to tidal conditions 426 MW	http://tinyurl.com/ossjp2s

The number of reactors offline led to a flurry of stories about wind providing a greater proportion of our electricity than nuclear at certain times. (3) On Sunday 19th October wind provided 24% of the UK's electricity supply for the entire day. The previous record stood at 22% of total generation in August this year. Wind's consistently strong performance saw it outperform nuclear power from Friday evening throughout the whole weekend and into Monday morning. A number of coal plants being taken offline as they were surplus to requirements. (4)

1. Carbon Commentary 30th Oct 2014 http://www.carboncommentary.com/2014/10/30/national-grids-winter-outlook-relies-on-impossible-optimism-about-nuclear-power-over-the-next-few-months/ and Ecologist 31st Oct 2014 http://www.theecologist.org/News/news_analysis/2616920/uk_faces_serious_winter_blackout_risk_national_grids_rosy_nuclear_forecast_fails_reality_test.html
2. Telegraph 17th Oct 2014 http://www.telegraph.co.uk/finance/newsbysector/energy/11169625/Nuclear-reactor-heat-turned-down-to-stop-boilers-cracking.html
3. Guardian 6th Oct 2014 http://www.theguardian.com/environment/2014/oct/06/uk-wind-power-bests-nuclear-power-for-a-few-symbolic-minutes
4. Renewable UK 20th Oct 2014 http://www.renewableuk.com/en/news/press-releases.cfm/2014-10-20-wind-power-steps-up-when-nuclear-and-gas-go-offline

5. Hunterston Cracks

New cracks have been found in one of the reactors at Hunterston B nuclear power station in North Ayrshire. Two of about 3,000 graphite bricks[1] in the core of reactor four are affected. Plant operator, EDF Energy, said the cracking was predicted to occur as the station aged and it would not affect the safe operation of the reactor. These new cracks were found during a routine inspection which began in August, so they must have occurred since the last inspection in 2011. (1)

But Nuclear Engineer, John Large, described EDF's statements as "*overly reassuring*". He said the reasons for the cracking and any associated risk remain unknown. Over time, as a result of being bombarded by radiation, the graphite bricks gradually lose weight. The ONR regulates the state of the bricks and doesn't normally allow them to lose more than a set percentage of their weight before they are classed as having reached the end of their life. Cracking has to be taken into account by the Regulator when setting a weight loss limit. As the bricks line the reactor's core, they cannot be replaced which means once the bricks have lost a certain percentage of their weight this should signal the end of the power station's life. However, EDF, the station's owner, can apply to the regulator to increase the weight loss limit in order to extend the life of the power plant. (2)

It is not particularly reassuring that the Office of Nuclear Regulation simply raise the limit it sets for weight loss in the graphite blocks when asked to do so by EDF. (3)

The cracking is not a new issue. The problem of cracking bricks within the core of the reactors was first identified following maintenance checks during 2002 through to 2004. Large first studied and reported on the problem in 2006. His conclusions, which were later backed by the nuclear safety regulator, Office for Nuclear Regulation (ONR), were that the processes leading to the cracking were not fully understood.

The main area of concern in 2006 was the difficulty in locating cracked bricks, "*because of the limited time during a servicing outage to access all of the fuel and control rod channels - about 240 in total - that pierce through the core and the fact that the cracking develops on the outer face keyway locality which is not directly accessible from within the channel. So whereas only one or two cracks might be actually detected, this presence of these cracks is a clear indication that other cracks have developed and exist but which are beyond detection*," Large said.

Large added that an indication of how serious an issue the problem was is reflected in the ONR's ongoing research and development program and the fact plant operators, EDF Energy, claims to have 200 staff and engineers working to find a solution to the problem. The problem is likely to be happening in all 14 of the UK's Advanced Gas-cooled Reactors (AGR). "*Little progress seems to have been made in the understanding of why and at what rate the graphite bricks are degrading*

[1] Some news reports said 6,000 graphite bricks. Whether it is 3 or 6,000 depends on your definition of a brick – in other words it depends on whether you count the plugged channel and interstitial bricks.

and cracking and, particularly, how this affects the residual strength of the individual bricks and overall core assembly in the event of a sudden pressure change in the reactor gas circuit." (4)

Serious distortion of the graphite core due to cracking could prevent the insertion of control rods, which are essential for safety and are used to shut down the reactor in an emergency. (5)

In 2006 Large analysed a bundle of documents received under the Freedom of Information Act about Hinkley Point B and Hunteston B. It concluded that there are "*...significant uncertainties over the structural integrity and residual strength of the moderator cores in ...AGR plants ... in view of the increased risk presented by continued operation of these nuclear plants, the reactors should be immediately shut down and remain so until a robust nuclear safety case free of such uncertainties has been established.*" (6) John Large said it was "*gambling with public safety*" to allow Hinkley Point and Hunterston to continue operating. (7) The documents, written by the former Nuclear Installations Inspectorate, reveal that AGRs are structurally defective and their continued operation is increasing the risk of a radioactive accident. (8)

The Office for Nuclear Regulation (ONR) says it strictly regulates the state of the bricks. However, in June, it approved a request by EDF Energy to increase the limit of graphite weight loss from 6.2% to 8%, at Dungeness B. Now, EDF Energy has published more information about graphite loss across the AGR fleet Hunterston & Hinkley Point B have an estimate weight loss of 12.8% and a limit set at15%. (9) So the limit will probably need to be raised if Hunterston B is to continue generating until 2023.

Nuclear commentator, Peter Lux, points out that the 12.8% figure is for the core as a whole. Some areas might have over 40% weight loss. The graphite blocks are also cracking as well as losing weight. Short of decommissioning the reactors it is very difficult to accurately determine the weight loss and cracking in the bricks. This level of weight loss was not expected when the reactors were originally designed and the weight loss and cracking is still not adequately understood. ONR have expressed concern about the methodology being used to calculate weight loss and the small margins between weight loss and the limits. (10)

John Large said that degradation of the graphite bricks was a common issue to all EDF Energy's 14 AGR reactors. He added that it was impossible to detect the cracks in all the bricks, which cannot be replaced. "*You can't confidently say that these reactors will pass a safety review*." (11)

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6. PLEX and ESPOO

A decision taken earlier this year at an international convention known as the Convention on Environmental Impact Assessment (EIA) in a Transboundary Context, or the Espoo Convention, has huge implications for the UK's ageing nuclear reactors. According to the decision all ageing nuclear power stations in Europe will now have to have an environmental impact assessment (EIA) before a licence renewal or the approval of a 10-year-periodic safety review. And the EIA will have to compare the potential impact of extending the life of an old reactor with supplying energy from alternative sources such as renewable energy. (1)

A discussion at the Meeting of Parties of the Convention (MoP) on the lifetime extension of the Rivne 1 and 2 nuclear reactors in Ukraine endorsed the conclusions of its Implementation Commission. As a result, all ageing nuclear power stations in Europe will have to be submitted to an environmental impact assessment before a licence renewal or the approval of a 10-year-periodic safety review.

This is a groundbreaking decision. Most European countries extend the lifetimes of their ageing nuclear reactors by looking only at whether prescribed safety standards are met. Normally, there is no consideration of whether the risk of a severe accident and associated environmental impacts is justified at an ageing power station in comparison with other ways of generating the same electricity. And the public is not consulted. This now has to change.

The Espoo Implementation Committee urged Ukraine to carry out an EIA that would permit public participation and prepare EIA documentation before the next periodic safety review.

The next Periodic Safety Review (PSR) for Hunterston B is due to be submitted by EDF Energy to the Office for Nuclear Regulation (ONR) in January 2016, and ONR will make a decision on this in January 2017. The Scottish Government claims the PSR is not the same as a life extension but rather a routine safety assessment.

In response to a query about the Espoo Convention in relation to life extensions, the Scottish Government said signatories to the Convention agreed to the text of a nuclear declaration at a Meeting of Parties in June 2014. This includes the following: "*Consider that if an activity needs upgrade works during its lifecycle that might have significant adverse environmental impacts, this should be considered as a major change to the activity in question and be subject to the provisions of the Convention*." The extension of an operating permit does not fall within the scope of the European EIA Directive unless there are also works or interventions involving alterations to the physical aspect of the site.

In other words the Scottish Government is claiming that unless there are works or interventions involving alterations to the physical aspect of the site, an Environmental Impact Assessment is not required.

But ESPOO says that a lifetime extension is a major change, even in the absence of any works, and therefore it is subject to the Convention. The ESPOO Implementation Commission agreed

that the extension of the life of a nuclear power station originally expected to run for 30 years for a further 20 years is an activity which requires an Environmental Impact Assessment.

Under Article 6 of the Aarhus Convention public participation is required in Environmental Impact Assessments.

Alison Johnstone, Green MSP for Lothian raised this issue on 7th October in the Scottish Parliament. She asked Energy Minister Fergus Ewing if the Scottish Government would support the case for having full environmental impact assessments when licence extensions for plants such as Hunterston and Torness are considered.

Mr Ewing responded that:

"*…the environmental case was considered when Hunterston B's life was extended to 2023. That extension was made two years ago, and it has already been fully discussed and reported in the Parliament. In addition to that and the life extension case, it is my understanding of the process [that] the next periodic safety assessment is due to be carried out in 2016*". (2)

Alison Johnstone MSP said:

"*In light of the Hunterston cracks it is important we challenge the fact that the public has no say in the Periodic Safety Reviews and lifetime extensions granted to our nuclear plants. International law says extensions require public consultation and must compare the potential impact of extending an old reactor with supplying energy from alternative sources such as renewable energy*."

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2. Herald 8th Oct 2014 http://www.heraldscotland.com/news/home-news/scottish-government-receives-assurances-over-safety-of-hunterston-b.1412692416

7. Waste Transport Ship Fire

A ship carrying Intermediate Level Waste from Dounreay to Belgium which caught fire and began drifting in the Moray Firth, has raised new concerns about plans to move waste and fuel from Dounreay to Sellafield by sea.

The MV Parida was transporting a cargo of cemented radioactive waste when a fire broke out in a funnel. The blaze was extinguished, but 52 workers were taken from the Beatrice oil platform by helicopter as a precaution. The NDA said the platform was evacuated because the ship may have crashed into it, but not out of any concerns about radioactive contamination. (1)

Questions were asked about why this ship set out given the severe weather warnings. Highlands Against Nuclear Transport (HANT) said the incident was a warning about transporting radioactive cargoes by sea, and called for proposals to move other nuclear waste from Dounreay to Sellafield by sea to be scrapped. Angus Campbell, the leader of the Western Isles Council, said the Parida incident highlighted the need for a second coastguard tug in the Minch. “A ship in similar circumstances on the west coast would be reliant on the Northern Isles-based ETV [emergency towing vessel] which would take a considerable amount of time to get to an incident in these waters.” (2)

Cumbrians Opposed to a Radioactive Environment say the contentious plans to ship some 26 tonnes of ‘exotic’ nuclear materials (irradiated and unirradiated plutonium and highly enriched uranium fuels) from Dounreay to Sellafield have moved a major step closer following recent sea and port trials in Scottish waters undertaken by the NDA’s ship Oceanic Pintail which is based at Barrow-in-Furness. (3)

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8. Capacity Markets

Matthew Lockwood at Exeter University writing about Britain's new Capacity Market (CM) being introduced as part of the Electricity Market Reform package says National Grid has now released figures on what capacity has pre-qualified for the CM. Apart from the point made by Greenpeace and Sandbag that the CM looks likely to prop up our old coal-fired capacity, what is particularly disappointing but not surprising is the picture on demand-side response (DSR).

In total, just over 1 GW of DSR units applied for pre-qualification, of which around 794MW has been pre-qualified or conditionally pre-qualified. Rejected units may still prequalify on appeal, but this is still a paltry amount. Qualifying DSR represents less than 1% of GB peak capacity, compared with the 10% of peak capacity actually delivered by DSR in the PJM market in the US (a regional transmission organization that coordinates the movement of wholesale electricity in all or part of 13 states and the District of Columbia.) It is of course early days, but given the extensive experience of DSR in the US, it does appear that few lessons have been learned in terms of auction design and the need to proactively build the DSR market. (1)

National Grid announced that companies including Drax, Centrica and EDF have qualified for "capacity payments" designed to reward generators for providing back-up power to the grid, after 513 separate applications were received. These hand-outs look very much like 'perverse fossil fuel subsidies' (2)

It's not yet clear which power stations will be included in the scheme. That's important, as it will determine how much coal, gas, or oil gets burned for power generation, and what the impact on the UK's emissions will be. On December 16th, the government will hold an auction to make sure there are 50.8 gigawatts of capacity available. Power plants can bid to supply electricity, or energy intensive companies can offer to cut the amount of power they use, for a particular price. (3)

Consumers will be forced to pay higher energy bills to fund policies that simultaneously tax coal plants to the brink of closure and then pay them to stay open, the head of Britain's biggest energy supplier has warned. Sam Laidlaw, chief executive of British Gas owner Centrica, warned there was an "inherent paradox" in Government policies, which risked ending up being neither green nor affordable. As part of plans to switch to greener energy, ministers last year introduced a rising carbon tax, the so-called "carbon price floor", which charges power plants for burning fossil fuels. But Lawrence Carter, energy campaigner at Greenpeace, said: "The most influential energy boss in the country is now confirming what Greenpeace and others have been warning all along. A big chunk of these new energy hand-outs will be pocketed by coal plant operators and used to extend the lifespan of some of Europe's most polluting power stations. (4)

Meanwhile, a report by Cambridge Econometrics says a 40% cut in energy use by 2030 through efficiency measures would increase the UK's GDP by £62bn and create 40,000 new jobs. But a lower target of 30% would only create 13,000 jobs and boost the economy by £17.3bn. (5)

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3. Carbon Brief 6th Oct 2014 http://www.carbonbrief.org/blog/2014/10/what-the-uks-capacity-market-could-mean-for-the-future-of-coal-gas-and-energy-sector-emissions/
4. Telegraph 23rd Oct 2014 http://www.telegraph.co.uk/earth/energy/11183161/Energy-paradox-how-your-bills-will-rise-to-phase-out-coal-power-plants-and-to-keep-then-running.html
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9. Energy Politics

Is there such a thing as a rightwing energy policy? If there is, you might think it would be based on the rigorous application of free market principles. However, that doesn't accord with the right's (including UKIP's) support for nuclear power – a form of energy that almost always requires state subsidies. (1)

Former Environment Minister Owen Paterson wants the UK to suspend the Climate Change Act until other nations adopt similar targets. Yet he still wants to small modular nuclear reactors (SMRs) built which is very odd. He appears to be arguing that investment in renewable technologies should be ended just as costs are plummeting and there is some prospect that subsidies could be ended. Instead he wants to fund largely unproven nuclear reactors. (2)

Right-wing commentator Tim Montgomerie, writing in *The Times* says renewable subsidies take money from pensioners who can barely afford to heat their homes and transfer it to rich landowners while ruining beautiful landscapes in the name of climate change policy. But Montgomerie can't understand why Paterson made no criticism of the Hinkley Point nuclear deal. He says opponents of the green movement must be consistent. (3)

The Climate Change Committee says SMRs would not be an option we could identify now as an option to rely on – there are large uncertainties over price and public acceptability, but they might have a role in future if those issues are positively resolved. (4)

Dieter Helm, Professor of Energy Policy at Oxford University says Owen Paterson, the former environment secretary, is right about at least one thing: UK climate change policy is not going well. Forty per cent of British electricity now comes from coal, the dirtiest kind of generation. At the same time, vast sums are being spent on cutting carbon emissions. Ed Davey Chris Huhne and Ed Miliband have between them dismantled the market-driven system created after privatisation and replaced it with something that looks more like the old Central Electricity Generating Board. The government now decides how much electricity the country needs, and how it should be generated. It is underwriting the investment needed to build the new plants and fixing the price at which they will sell power. You might have expected Mr Paterson, as an economic liberal, to point out the power of the market to bring about an efficient allocation of resources. Not a bit of it. For him the problem is not that the government has tried to pick winners but that it has chosen badly. The right technologies, Mr Paterson says, are shale gas, small nuclear power stations, plants that generate heat as well as electricity, and measures for limiting peak demand. But we don't really know which method is best. We should leave it up to the market to decide. (5)

Part of Paterson's strategy is to present himself as the voice of the common sense, silent majority; the 12 million rural voters; the businesses who are apparently suffering so much from climate legislation that they may, one day, leave the UK. The reality is very different. As countless polls have shown around 60 per cent of the public support wind energy and over 80 per cent favour solar power - significantly, rural communities also tend to show majority support for renewables. Some people hate renewable energy, many more are broadly supportive of it. Meanwhile, the plummeting cost of clean technologies and the emergence of

energy storage systems (which are far more advanced than Paterson's neighbourhood nuclear reactors) mean the economic and technical arguments against clean energy look ever more outdated. (6)

Catherine Mitchell, Professor of Energy Policy at Exeter University says Owen Paterson's argument that Parliament is being taken over by the Green Blob is reactionary and evidence-free. The 'black fog' which supports fossil fuels and the conventional energy system is far bigger, and has a far greater impact. (7)

Communities and local government secretary Eric Pickles seems to be campaigning to stamp out onshore wind. He has just halted his 50th project. Accused by Labour and Lib Dems of exceeding his powers, he overrides local planning systems and inspectors, pulling 85% of wind energy capacity out of the standard process for purely political purposes. Just as onshore wind becomes the cheapest renewable energy source, the Conservatives have committed to effectively abolishing it: their manifesto will pledge to remove subsidies, jeopardising future investment and rural jobs. In all of Somerset there is just one wind turbine, according to Polly Toynbee. (8)

And now Owen Patterson's replacement as Environment Secretary, Liz Truss, has branded solar farms "*…a blight on the landscape*" and announced plans to scrap subsidies for new developments. She announced that farmers will no longer be able to claim subsidies for filling fields with solar panels, in a government drive to ensure that more agricultural land is dedicated to crops and food. (9) If that really is the motivation she should do something about the 2,000 18-hole golf courses in England. Some may be located on recovered quarries or disused airfields, but many are on previously productive agricultural land or on the edge of towns where housing stock is in short supply. And each and every one of them is probably larger than the UK's biggest solar farms. (10)

Defra admitted it has not undertaken an estimate of how much arable land has been taken out of production as a result of the expansion of solar farms. (11)

Meanwhile Sadiq Khan MP has been appointed by Labour's election campaign manger Douglas Alexander to lead the fightback against the Green Party. He thinks that Labour has changed and it shares Green values and "*will be a government* [Green supporters] *can be proud of*". He forgets to mention that the Greens oppose all UK nuclear weapons and replacing the £100bn Trident nuclear weapons system; oppose fracking; and nuclear energy, and particularly the building of the taxpayer-subsidised £34bn new nuclear reactors at Hinkley Point C (HPC). (12)

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2. Business Green 13th Oct 2014 http://www.businessgreen.com/bg/james-blog/2375293/owen-paterson-the-kevin-pietersen-of-climate-politics
3. Times 18th Oct 2014 http://www.thetimes.co.uk/tto/opinion/thunderer/article4240399.ece
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10. Small Reactor Delusion

There's an Alice in Wonderland flavour to the nuclear power debate, writes Jim Green of FoE Australia, in *the Ecologist*. Lobbyists are promoting all sorts of new reactor types - an implicit admission that existing reactors aren't up to the job. But the designs they are promoting have two severe problems. They don't exist. And they have no customers. (1)

On Patterson's favoured Small Modular Reactors (SMRs) he quotes Thomas W. Overton, associate editor of POWER magazine, who wrote in a recent article:

"At the graveyard wherein resides the "nuclear renaissance" of the 2000s, a new occupant appears to be moving in: the small modular reactor (SMR). ... Over the past year, the SMR industry has been bumping up against an uncomfortable and not-entirely-unpredictable problem: It appears that no one actually wants to buy one."(2)

The reason conventional nuclear plants are built so large is the economies of scale: Big plants can produce power less expensively per kilowatt-hour than smaller ones. The SMR concept disdains those economies of scale in favour of others: large-scale standardized manufacturing that will churn out dozens, if not hundreds, of identical plants, each of which would ultimately produce cheaper kilowatt-hours than large one-off designs. But first someone needs to build a massive supply chain. Money for that would presumably come from customer orders - if there were any.

Former CoRWM Chair, Professor Gordon Mackerron says no SMR (properly defined) has yet been commercialised anywhere in the world, and work on them – mainly in the USA – has been waning, as their developers, notably Westinghouse, have said they cannot find a market. This is unsurprising as their cost per unit of output is higher than the already expensive conventional, larger reactors, unless hundreds can be sold to give manufacturing economies. The MIT, in their study of the future of nuclear power convincingly argue that radically new nuclear technologies take up to 50 years to become established due to factors like the need for safety licensing, prototype experimentation, planning and siting approvals, slow construction times – all in the context of historically rising costs and a need to win public acceptance. So we should expect no significant contribution from SMRs by 2050, even if they do become commercialised, which is far from clear. (3)

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2. Power Mag 1st Sept 2014 http://www.powermag.com/what-went-wrong-with-smrs/
3. Sussex Energy Group 17th Oct 2014 http://sussexnrggrp.wordpress.com/2014/10/17/response-to-pattersons-unremarkable-and-nonsensical-speech/

11. Waste Notes

- The white paper "Implementing Geological Disposal", published in July this year, tasked Radioactive Waste Management Ltd (RWM), a subsidiary of the Nuclear Decommissioning Authority (NDA), with carrying out a desk based screening exercise which will review existing information on the geology of the UK in order to develop and apply appropriate guidance. The work will be reviewed by an Independent Review Panel. Over 80 delegates representing academia, the geoscience community, the supply chain and non-Governmental Organisations attended an NDA National Geological Screening Technical event. (1)

- A final shortlist of possible locations to store radioactive waste from redundant nuclear submarines has been published by the Ministry of Defence. They are Capenhurst, Cheshire; Sellafield, West Cumbria; Aldermaston and Burghfield, Berkshire; and Chapelcross, Dumfriesshire. Public meetings will be held from next month until February 2015 in each area. Defence Minister Phillip Dunne said analysis had not presented any grounds for discounting any of the sites on the provisional list. (2)

- The NDA, specifically tasked in 2005 with the clean-up and decommissioning of the UK's dirty and deteriorating nuclear licensed sites, has announced that it is to pour £13m of taxpayers' money 'to help develop innovative technologies for the current and next generation of nuclear power stations. Cumbrians Opposed to a Radioactive Environment (CORE) spokesman Martin Forwood roundly condemned the move as a gross waste of public money on a technology already fighting to survive and meet development targets despite massive Government hand-outs. (3)

- Some of the national daily papers picked up on continuing problem with the state of the legacy waste being held at the Sellafield site after *The Ecologist* published some photos of the highly dilapidated state of cooling ponds B29 and B30. (4) Nuclear safety expert John Large called it a '*significant risk*' and expert in radiological risk Gordon Thompson (USA) told *the Guardian*: "*The site's overall radiological risk has never been properly assessed by the responsible authorities. [The] photos, showing disgracefully degraded open-air ponds at Sellafield, indicate that a thorough assessment of risk is overdue*." (5)

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12. Renewable Heat

WWF's latest energy report: '*Warm homes, not warm words'* calls for stronger government action to tackle carbon emissions from heating homes. The report states that currently just 2% of UK heating demand is met by low-carbon sources and the Government is "very far" from the 25% goal to be achieved by 2030. This is especially important as heating accounts for 32% of the UK's greenhouse gas emissions and 44% of energy use. Zoe Leader, WWF-UK's Climate and Energy Specialist, said:

"*The Government's support for renewable heat is making slow but steady progress, but at the current rate will fail to meet our climate change goals. In the next 15 years, the UK needs to insulate eight million lofts, install nearly four million heat pumps and quadruple the number of homes connected to heat networks.* (1)

Another new report: *Building the Future* has piled pressure on Ministers to act to fix Britain's badly insulated homes. The report from Cambridge Econometrics and Verco and commissioned by Energy Bill Revolution, shows that a much more ambitious energy efficiency investment programme would pay for itself and significantly boost the UK economy. The programme would add £13.9 billion annually to the UK economy by 2030, with GDP boosted by £3.20 for every £1 invested by the Government. A national scheme to make homes super-energy efficient would result in £8.6 billion in energy savings per year by 2030, an average energy saving of £372 per household. After taking into account loan repayments this would result in £4.95 billion in financial savings per year for Britain's households.

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