Renew on line 113  Jan-Feb 2015
Technology for a Sustainable Future
A bimonthly roundup of news and views on renewable energy developments and policies

Produced by NATTA, the independent Network for Alternative Technology and Technology Assessment.

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Renew was for many years produced by Prof. Dave Elliott and Tam Dougan, then based at the Open University, as a bimonthly NATTA membership subscription journal, with, after issue 100, a free shortened version, Renew on Line (ROL), also produced for NATTA’s web page. Now run by NATTA independently of the OU, ROL is currently delivered as a Blog, and continues with the same numbering system. It includes a Forum section for commentary and feedback. An expanded version, called Renew, continuing with the old Renew numbering system, is also produced for use by students on relevant courses, on a course linked password protected subscription basis. Course leaders wishing to subscribe on behalf of their students should contact NATTA for details of charges. Students on the OU Renewable energy course T313 have access to it: www3.open.ac.uk/study/undergraduate/course/t313.htm

Send comments/contributions for the Forum section to NATTA at D.A.Elliott@open.ac.uk

Also see Renew Extra which is posted alternate months to the bimonthly Renew On Line at: http://renewextra.blogspot.co.uk
For a full guide to NATTA’s various offerings, the PDF version of ROL, and access to our free annual end of year review, see: http://renewnatta.wordpress.com

*With the closure of the Fogeys server, the old NATTA web site and emails no longer work.

Goodbye Ches  We are very sad to report the death, on Christmas eve, of Ches Lincoln, who for many years was our IT wizardess. After her retirement from the OU, she ran the Fogeys server which carried our NATTA/Renew web site. She will be missed.
1. UK Developments- overview

It’s an election year and RenewableUK (RUK) has produced its own Manifesto. They present the chart above, based on DECC/CCC data: 56% from renewables by 2030, but still a lot of nuclear in there. That seems to be because DECC/CCC see its costs as being similar to on-land wind and less than offshore, even by 2030. That’s debatable. RUK says onshore wind should be the cheapest new source by 2020, while offshore wind should be at £100/MWh, and by then ‘wind should be meeting a quarter of the UK’s electricity need’. It adds ‘The Committee on Climate Change [CCC] expects wind, wave and tidal to supply up to 44% of the UK’s electricity by 2030’ (as above). It also says that ‘by 2050 there is the potential for 50% of the UK’s power to come from offshore wind alone, depending on the development of an interconnected grid’, and it suggested that up to 20% of UK electricity could come from wave and tidal by 2050. So, if fully achieved, that’s 70% in total by then, even leaving aside solar, biomass, hydro, geothermal.

What next? RUK says that the Government needs to ‘set a clear path for investors by setting a 2030 decarbonisation target, with an accompanying extension of the Levy Control Framework, and an indication of how different technologies will play their part. The strongest signal of all would be a 2030 renewables target.’ Continued support was also vital for innovation to get costs down e.g. for offshore wind.

Electoral issues: RUK says that 61% of Conservative voters, 72% of Labour and 79% of Lib Dems back wind, as (surprisingly) do most UKIP voters. In 2013 wind, wave & tidal employed 18,465 directly, and ‘on average a wind farm contributes £100,000 per installed MW to the local community’, so ‘a typical wind farm with five 2 MW turbines represents a £1m investment in the local area through employment, contracts and community benefits over its lifetime’.

A good pitch! RUK says that, in CCC’s projections (see above), wind doubles or triples from 2020 to 2030 and wave/tidal expand 20 times. Why not? At least that. And more later: www.renewableuk.com/en/publications/guides.cfm/general-election-manifesto

* ‘The UK is better off to the tune of 1.5% of GDP if it follows the decarbonisation path rather than doing nothing. It’s just a myth that this is all hopelessly expensive.’ Matthew Knight, Siemens UK Energy, at an energy fringe meeting at last years Labour Party Conference. But former environment secretary Owen Paterson attacked the ‘wicked green blob,’ and its climate views at the Tory party conference: ‘There has not been a temperature increase now for probably 18 years, some people say 26 years’. Then he launched his alternative plan: mini-nukes/CHP/shale gas/DSM, no big nukes or renewables. And scrap the climate change act. See below.

Versus the Green Party: http://policy.greenparty.org.uk/ey.html
Wind ups & downs

Wind energy is doing well. There were periods last year when wind met up to 15% of power demand, over-taking nuclear, even briefly 24%: [www.carboncommentary.com/2014/10/06/wind-power-exceeds-nuclear-output-for-a-few-minutes/](http://www.carboncommentary.com/2014/10/06/wind-power-exceeds-nuclear-output-for-a-few-minutes/) For current output see: [http://winderful.diascreative.net](http://winderful.diascreative.net)

But wind plant output over the year was relatively low, due to low average wind speeds (a wonderful long summer), with, in Sept, a load factor of only 9%, the 11.2 GW of wind capacity then only meeting around 3.3% of UK power demand. See Energy Matters: [http://euanmears.com/uk-wind-power-in-the-doldrums/](http://euanmears.com/uk-wind-power-in-the-doldrums/) This web site also had a 100% UK renewable scenario, with a large wind contribution, which, like the Adam Smith Institute (see later), it sees as problematic; but then it didn’t include grid balancing options like wind-to-gas and CHP/ DH/heat stores: [http://euanmears.com/electricity-supply-electricity-demand-and-100-renewables/](http://euanmears.com/electricity-supply-electricity-demand-and-100-renewables/)

See also [www.telegraph.co.uk/earth/energy/windpower/11186206/Wind-farms-can-never-be-relied-upon-to-deliver-UK-energy-security.html](http://www.telegraph.co.uk/earth/energy/windpower/11186206/Wind-farms-can-never-be-relied-upon-to-deliver-UK-energy-security.html) The UK capacity market is meant to help with balancing too, but there’s been some concern that it might be taken by (oh horror!) foreign suppliers: [http://realfeed-intariffs.blogspot.co.uk/2014/10/blind-british-europhobia-as-times-tilts.html](http://realfeed-intariffs.blogspot.co.uk/2014/10/blind-british-europhobia-as-times-tilts.html)

As for new projects, while some got through, Communities and Local Government secretary Eric Pickles turned down 19 onshore wind farm applications last year, provoking complaints: [http://www.independent.co.uk/environment/green-living/eric-pickles-accused-of-rejecting-wind-farms-to-win-votes-9804278.html](http://www.independent.co.uk/environment/green-living/eric-pickles-accused-of-rejecting-wind-farms-to-win-votes-9804278.html) But there’s progress on some new large offshore wind projects. The 389 MW West of Duddon Sands project has started up in the Irish Sea, and the 69 turbine 250 MW Burbo Bank Extension in Liverpool Bay got development consent. So did Dong’s 660 MW Walney Extension off Cumbria and the Siemens/Mainstream 1.2 GW Hornsea 1 off Yorkshire. E.on’s Rampion off Sussex has already been accepted, but is to be cut by 300 MW, to 400 MW with 116 turbines. Next, Abu Dhabi’s Masdar is to invest £525m in the planned Dudgeon project, off Norfolk. Meanwhile a 630 MW alternative to the 970 MW Navitus Bay project on the South coast has been submitted, while 4 projects in the Forth and Tay, 2.28 GW in all, have got development consent from the Scottish Government - Neart Na Gaoithe, the Inch Cape Inc project, and Seagreen’s Alpha and Bravo projects.

Though elsewhere the story is not so good and may get worse: [http://bit.ly/1rXxN8y](http://bit.ly/1rXxN8y) RWE has decided not to go ahead with the 340 MW Galloper offshore project (see map) off Essex/Suffolk. It blamed tight time scales to secure financing while still qualifying for the soon-to-expire renewables obligation subsidy scheme. Fellow developer SSE had pulled out of the project in Sept, but RWE said that it had been in talks with possible investors, including the Green Investment Bank. Wind Power Monthly said RWEs move ‘will ring alarm bells about the UK government’s incoming CfD subsidy scheme, with RWE seemingly unwilling to develop the project under this regime’. It noted concerns that the budget allocated to fund projects under the CfD wont cover all planned off-shore wind projects. ScottishPower said it could cancel the East Anglia One project if didn’t get a CfD.

7.5 GW of EU-UK grid links

Following an initial assessment of bids, Ofgem says 5 new large grid interconnector projects could be built. Along with the 1 GW ElecLink to France and 1 GW Belgian Nemo project Ofgem already assessed, the projects, worth £6bn, could provide up to 7.5 GW of UK capacity access. Ofgem says all 5 projects meet minimum eligibility criteria. They would link the UK’s network to France, Ireland, Norway and Denmark, adding to the existing 3.5 GW of French, Irish and Dutch links. Ofgem will now move to the next stage of assessment, looking at their impact, how they interact, and whether they deliver value for money. If successful, work on some could start in 2016 with power connections in 2019/20. [http://www.ofgem.gov.uk/publications-and-updates/ofgem-shortlists-five-new-electricity-interconnectors](http://www.ofgem.gov.uk/publications-and-updates/ofgem-shortlists-five-new-electricity-interconnectors)
Long distance solar - a long shot?

Although PV solar is doing quite well in the UK (see Box), despite the FiT cuts and solar farm opposition, there has been a proposals for a much grander concept - concentrated solar power plants in Tunisia sending power back to the UK. This follows DECCs idea of offering CFd support for projects outside the UK. Irish wind projects were one possibility, but TuNur, a partnership with UK renewables investor Low Carbon, developer Nur Energy, and Tunisian investors, says it has already spent €10m developing a 2 GW CSP site in the south of the country, for a possible 2018 start up. It initially had links with the Desertec initiative, but later withdrew. A bit of a stretch.

DECC said ‘to reduce costs for British consumers, any future non-UK project would need to compete on cost-effectiveness with projects in the UK before being allocated a CFd’. TuNur says it can. But Solar Century said ‘The very last thing we need is the additional medium-term uncertainty that would be created in the early years of the next Parliament from any decision to push on with opening up the CFd scheme and Levy Control Framework budget to foreign projects’. www.bbc.co.uk/news/science-environment-29551063

Or float it! www.fwi.co.uk/articles/29/10/2014/147341/reservoirs-and-lakes-offer-floating-solar-space.htm

Solar Farms hit again

The new Environment Secretary Liz Truss seems to have picked up where the old one, Owen Paterson, left off, and has come out against solar farms: ‘Solar panels are best placed on the 250,000 hectares of south facing commercial rooftops where they will not compromise the success of our agricultural industry’. The Mail quoted her as saying: ‘I’m very concerned that a lot of our land is being taken up with solar farms. We’ve already got 250 of them and we’ve got 10,000 football pitches worth of new solar farms in the pipeline. They are ugly, a blight on the countryside, and villages are pushing production of meat and other traditional British produce overseas. I’m not against them per se - they’re fine on commercial roofs and school roofs - but it’s a big problem if we are using land that can be used to grow crops, fruit and vegetables. We import two-thirds of our apples, and using more land for solar panels makes it harder to improve that.’

And her Department (DEFRA), has announced that from January, farmers will lose their right to claim subsidies for fields filled with solar panels, so as to ‘ensure more agricultural land is dedicated to growing crops for food’. So farmers using fields for PV arrays will lose payments for that land under the EU Common Agricultural Policy. Defra said this will save ‘up to £2m of taxpayers’ money each year that won’t be available for these subsidies’. It added ‘The changes the government is making are expected to slow down the growth of solar farms in the countryside in England. There are currently 250 installed, with the biggest covering as much as 100 hectares. Under previous plans, the number of fields dedicated to solar farms was set to increase rapidly, with over 1,000 ground-based solar farms expected by the end of the decade across the UK. These changes should help to halt this expansion as it will now become less financially attractive for farmers to install the solar panels.’

Dare we say that Golf courses take up more room - over 0.5% of UK land area (see Forum). But then, asked in Parliament (Oct 27) what estimate DEFRA had made of the area of land occupied by solar arrays that was arable land useable for economically farmed fruits or vegetables, the minister admitted ‘We have made no estimate of the amount of land occupied by solar panels which was arable land useable for economically farmed fruits or vegetables’. Tut tut..

Wave power

Ecotricity’s Searaser wave pump system has been doing well in trials:

http://www.thegeologist.org/News/news_round_up/2610729/new_wave_generator_brightens_ocean_power_prospects.html

But tragically pioneering company Pelamis has gone into administration, after failing to secure more development funding. Aquamarine, the Oyster’s developer, is also in trouble.
DECC Renewables progress review

The problems above may slow things, but for the moment the overall picture for renewables in the UK is still good, despite the slight fall in mid 2014 due to low wind speeds: with 22 GW total installed, in the first quarter they hit 19.5% of electricity. www.gov.uk/government/statistics/energy-trends-section-6-renewables


But variable wind takes another hit..

Wind farms can never be relied upon to keep the lights on in Britain because there are long periods each winter in which they produce barely any power, says a report produced for the Adam Smith Institute and Scientific Alliance. It claims that a 10 GW fleet of wind farms across the UK could only ‘guarantee’ to provide less than 2% of its maximum output as firm supply, because ‘long gaps in significant wind production occur in all seasons’. Its model found that for 20 weeks in a typical year the wind farms would generate less than 20% (2 GW) of their maximum power, and for nine weeks it would be less than 10% (1 GW). www.adamsmith.org/wp-content/uploads/2014/10/Assessment7.pdf

This is hardly news: although it can provide some input most of the time, in isolation, within any specific region like the UK, wind is mainly a fuel saver, not a firm energy supplier. But within a grid network with other renewables inputs, demand management and energy storage facilities, it may be possible to balance the overall system, without the need for fossil fuel backup, as was demonstrated by the German Kombikraftwerk modeling exercise: http://bit.ly/1u40xwM. That avoided grid imports, but if you also allow supergrid links over long distances, then it is also possible to import green power from other regions in the EU if there is a surplus, for extra grid balancing. However this report claims that there will be times when there is little wind anywhere in the north EU. Some disagree, looking to wider EU footprints. But it would take time for this and other balancing options to be developed, so back-up plants may be needed for a while. That’s what the capacity market is all about - linking in already existing fossil gas plants. But these can gradually be converted to run on green gas - biogas and stored gas from surplus wind-to-gas conversion. The key thing is that, if short-term grid balancing isn’t enough, it’s easy to store gas long-term, to deal with lulls in green supply. After all that’s what happens when nuclear plant go off-line for a while unexpectedly, as some have recently.

Capacity Market - first annual auction

The Capacity Market auction in December led to ~49 GW of capacity being contracted, out of ~65 GW of submissions, for reserve/back up duties from 2018 onwards if required, most of it being existing or refurbished fossil-fired capacity, along with near 8 GW of nuclear. See Table. That raised some hackles: Prof. Catherine Mitchell at Exeter University said that it was ‘supporting the status quo’, with the vast majority of payments going to large, well-known generators: ‘They have done a great job in persuading Government that unless customers pay this extra amount it would be uneconomic for them to keep the power plants running and the lights will go out. All of this money would have been far better used to develop a sensible demand side response market’. As it was only a tiny amount went to DSR (0.35 GW) but 2.7 GW did go to storage. The success of gas plants, large and small (around 25 GW in all), is not surprising, but the fact that coal (biomass co-fired) also got shares is worrying, if you see the aim the Capacity Market as being to reduce emissions.

It’s even worse if you think the aim was to back new capacity. Dave Jones, an analyst at Sandbag, said that: ‘The capacity market looks more like a subsidy scheme to keep heavy polluters online, rather than as a mechanism to encourage new investment - only five per cent of auction revenues will go to new investment. The capacity mechanism is actually slowing decarbonisation of the UK power sector.’ www.carbonbrief.org/blog/2014/12/capacity-market-secures-some-new-gas-while-providing-stay-of-execution-to-old-coal-%281%29

Most of the projects (44 GW) are only contracted for a year, but there were some longer term larger commitments. However The Telegraph pointed out that only one large new gas plant was contracted for and felt that this was odd given the alleged yawning energy gap and expected plant closures. It reported: ‘critics have suggested the policy is turning out to be poor value for money as it will hand vast subsidies to old nuclear plants that would have kept running anyway, and to old coal plants that are simultaneously being subjected to environmental taxes designed to force their closure’.


Seems no one liked it! But it was cheaper than expected, at £19.40/kW (totaling £990m) down from the initial reverse auction price of £75/kW. When it starts up, in 2018, it will put around £11 p.a. on consumers bills. And if you see it as just a way to ensure supply and demand are matched given expected plant closures and the increase in variable renewables, well it just about makes financial sense: gas plants are cheap, upgrading them is cheaper than building new ones and cheaper than storage. But demand management is surely going to be the cheapest option of all, long term. Interconnectors may also have a role, as DECC recognized. It has opened the scheme to grid links to Europe from 2020: www.businessgreen.com/bg/news/2384602/uk-opens-capacity-market-to-electricity-interconnectors

But what about consumers? Can’t they play an active role? This challenge failed: www.carbonbrief.org/blog/2014/12/brave-legal-challenge-launched-against-uk-capacity-market/

Maybe in the next round? Which will take it up to ~51 GW.

*The overall approach was said to be ‘technology neutral’, so in theory all options should have been eligible, although clearly it all depends on costs. Some feared the auction would yield a preponderance of cheaper but less environmentally appropriate options, e.g. there had been media stories about hundreds of diesel generators being used, along with 2-3 GW of small reciprocating gas fired plant. As can be seen something near that has emerged. It would be good if some could be CHP units feeding local peak heat loads, displacing peak power demand. Maybe next time
Siemens is

For a good overview: www.ukerc.ac.uk/publications/low-energy-framework-of-energy-and-environmental-policy not a narrow analysis of green job impacts.'

domain for the dynamics of technology development pathways. In other words, the proper overall economic efficiency, taking into account environmental externalities, the desired structure of the economy, and the dynamics of technology development pathways. In other words, the proper domain for the debate about the long-term role of renewable energy and energy efficiency is the wider framework of energy and environmental policy, not a narrow analysis of green job impacts.'

New Views An issue he, and DECC, may have to address is whether a large-scale nuclear-led approach will be viable in future: http://projects.exeter.ac.uk/igov/new-thinking-is-the-centralised-utility-model-past-its-sell-by-date/ IGov at Exeter University clearly sees distributed options as a better bet, stressing the benefits of focusing more on the demand side: http://projects.exeter.ac.uk/igov/new-thinking-network-governance-and-distributed-energy-resources/

The official line is that large-scale new nuclear is a key component of the future low carbon system, and that, as the ETI put it in evidence to the Lords ‘resilience’ review: ‘without investment in a major new nuclear build programme, the cost and difficulty of meeting the UK climate change targets will rise very significantly’. Some of the other submissions are also worth a look: www.parliament.uk/documents/lords-committees/science-technology/Resilienceofelectricityinfrastructure/Resilienceofelectricityinfrastructureevidence.pdf

There are other variants, including that promoted by Owen Paterson (see below). An amusing, if rather wild, speculation was floated by Euan Mearns on the Energy Matters web site. After noting that Paterson ‘has been well advised’ by various contrarians (he names Matt Ridley, John Constable & Benny Peiser) he suggests, as ‘a speculative fantasy’ that ‘Paterson was sacked by David Cameron to provide space for him to go off and formulate a sensible energy policy for the Tories in the lead up to next May’s general election. That Ed Davey is sacked in the New Year to be replaced by Mr Paterson and then the gloves come off and the general election takes centre stage.’

MCT crisis Siemens is to sell off MCT- Marine Current Turbines- the pioneering UK company it took over in 2012, due to the slow pace of orders.

Green jobs Do green projects actually create new net jobs?

A new UKERC report on ‘Low Carbon Jobs’ asks if policy-driven expansion of green energy actually creates jobs, taking account of both jobs created and jobs displaced. The report looks at job creation in renewable and energy efficiency and reviews over 90 existing studies. It concludes that there can be positive net job gains since these options are labour intensive. But it adds, if there is full employment, investing in job intense options isn’t needed. And it concludes that ‘What matters in the long-term is overall economic efficiency, taking into account environmental externalities, the desired structure of the economy, and the dynamics of technology development pathways. In other words, the proper domain for the debate about the long-term role of renewable energy and energy efficiency is the wider framework of energy and environmental policy, not a narrow analysis of green job impacts.’

Ok, but don’t we want green jobs? i.e. better replacement jobs. For a more prescriptive approach: www.climate-change-jobs.org/ See the separate back up notes. For a good overview: www.carbonbrief.org/blog/2014/11/can-green-energy-policy-create-jobs/ Meanwhile, Siemens is to invest £160m in wind turbine production and installation facilities in Hull creating 1,000 new jobs.
Outlier views - the backlash continues

The cost of renewables and carbon taxes will put an extra £983 a year on household bills by 2030 (£26bn in all). There could also be blackouts. That was a key message in the media last year picked up from a report from the Scientific Alliance/Adam Smith Institute (see above): www.express.co.uk/news/uk/522800/Wind-farms-blamed-for-winter-power-cut-and-rise-energy-bills

The remedy? New nuclear and gas plants to help plug shortfalls as old coal plants were closed. And no more silly wind power.

A similar sort of blast came from former Environment secretary Owen Paterson, in a speech to the Global Warming Policy Foundation - with which the Scientific Alliance seem to have much in common. He said the effects of climate change had been ‘consistently and widely exaggerated’, and that policies to encourage onshore wind farms will cost £1.3 trillion by 2050. He said the UK was alone in having legal mandatory emission cut targets.

That, and much else, was denied, in a response to early reports of his views, by the governments advisory Climate Change Committee. It also insisted that global warming has slowed not halted. And on his fears on the cost of the low carbon policy, it said ‘an average dual-fuel household will see around a £10 increase each year in energy bills until the mid-2020s, after which the impact of low-carbon policies on bills is expected to fall’.

The CCC was less concerned about his technology proposals. Leaving aside his very hostile comments on renewables (see Box), his backing for CHP and demand management is welcome, unless he meant mini-nuke/shale gas fired CHP, and big imposed supply cuts. He also backed AD from waste, but said it would be small. Basically his world would be shale gas/mini-nuke based… but not big nukes: too slow to build. Or CCS,

‘Onshore wind is already at maximum capacity as far as available subsidy is concerned […] DECC is struggling to control this subsidy drunk industry. Planning approval for renewables overall, including onshore wind, needs to come to a halt or massively over-run the subsidy limits set by the Treasury’s Levy Control Framework. However, this paltry supply of onshore wind […] has devastated landscapes, blighted views, divided communities, killed eagles, carpeted the countryside and the very wilderness that the “green blob” claims to love, with new access tracks cut deep into peat, boosted production of carbon-intensive cement, and driven up fuel poverty, while richly rewarding landowners.

Offshore wind is proving a failure. Its gigantic costs, requiring more than double the subsidy of onshore wind, are failing to come down as expected, operators are demanding higher prices, and its reliability is disappointing, so projects are being cancelled as too risky in spite of the huge subsidies intended to make them attractive. There is a reason we are the world leader in this technology - no other country is quite so foolish as to plough so much public money into it.

Hydro is maxed out. There is no opportunity to increase its contribution in this country significantly.

Tidal and wave power despite interesting small-scale experiments is still too expensive and impractical. Neither the astronomical prices on offer from the government, nor huge research and development subsidies have lured any commercial investors to step into the water. Even if the engineering problems could be overcome, tidal and wave power, like wind, will not always be there when you need it.

Solar power may one day be a real contributor to global energy […] But it is a non-starter as a significant supplier to the UK grid today and will remain so for as long as our skies are cloudy and our winter nights long. Delivering only 10 percent of capacity, it’s an expensive red herring for this country and today’s solar farms are a futile eye-sore, and a waste of land that could be better used for other activities.

Biomass is not zero carbon. It generates more CO2 per unit of energy even than coal. Even DECC admits that importing wood pellets from North America to turn into hugely expensive electricity here makes no sense if only because a good proportion of those pellets are coming from whole trees. The fact that trees can regrow is of little relevance: they take decades to replace the carbon released in their combustion, and then they are supposed to be cut down again. If you want to fix carbon by planting trees, then plant trees! Don’t cut them down as well. We are spending ten times as much to cut down North American forests, as we are to stop the cutting down of tropical forests. Meanwhile, more than 90% of the renewable heat incentive (RHI) funds are going to biomass. That is to say, we are paying people to stop using gas and burn wood instead. Wood produces twice as much carbon dioxide than gas.’ Owen Paterson


Critique: http://www.carbonbrief.org/blog/2014/10/factcheck-daily-express-claims-windfarms-will-add-£1000-to-household-bills/
Energy saving
DECC has been trying to talk up the Green Deal and ECO schemes and some progress does seem to have been made, despite the ECO cuts back. Energy Secretary Ed Davey said ‘We’re aiming to make 1 million homes warmer and more energy efficient by March 2015 - and we’re on track with nearly 800,000 homes helped through ECO and the Green Deal by the end of August. More than 350,000 homes have now had a Green Deal Assessment and our recent research indicates that 70% of people go on to get work done. Now with an extra £100 million for household energy efficiency, even more people will be able to cut their energy bills and have warmer homes sooner.’


Zero Carbon Homes-nuclear imports not an ‘allowable solution’
The government was asked, in a Parliamentary question (23 Oct), whether, in delivery of the Zero Carbon Homes policy, house builders can contract with a third party to deliver the carbon abatement measures outside of the built environment with (a) renewable energy technologies, (b) carbon capture and storage and (c) nuclear power in order to meet the house builder’s zero carbon obligation. Here is the ministerial reply: ‘The Government intends to adopt a flexible approach to defining the off site carbon abatement measures (allowable solutions) which can be supported by house builders to meet their zero carbon obligation and not apply restrictions which would rule out innovative, cost effective approaches. The Government’s consultation on “Next Steps to Zero Carbon - Allowable Solutions” set out examples of potential measures which could be supported, including renewable energy measures. The Government has not considered support for carbon capture and storage or nuclear power in the context of allowable solutions. However, the criteria based approach set out in the consultation for identifying appropriate carbon abatement measures would require that measures will need to bring forward additional, verifiable carbon savings at a cost effective price. Given carbon capture and storage, and nuclear power, would have high upfront costs, they would be unlikely to be cost-effective.’ So nukes and CCS are too expensive! Just as we thought… across the board. 


Green Heat The UK target is to have 25% of heating met by low carbon sources. Heat pumps and biomass boilers are being supported by the Renewables Heat Incentive (RHI), but WWF’s report Warm homes, not Warm Words says that just 2% of UK heating demand currently comes from low carbon sources. So it calls for a drastic scaling up of heat networks and renewable heat technologies across the country, and argues that ministers should confirm the future of the RHI out to 2020. WWF says ‘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. That’s not going to happen without stronger government support. The prize at the end will be many warmer, healthier homes that are cheaper to run.’ 
The report was welcomed by the Combined Heat and Power Association and the Renewable Energy Association. However the exact mix can be debated. It’s true that the UK needs a lot more heat pumps if the aim is to replace gas use for heating, but domestic heat pumps make most sense in off-gas areas. CHP fed District heating arguably is better in urban areas, with COP equivalents of up to 20, rather than ~3 for heat pumps.


More on CHP/DH in the UK: www.heatandthecity.org.uk/resources/newsletter
And for a global view, from the IEA: www.iea-dhc.org/home.html

Micro CHP: www.catalyst-commercial.co.uk/energy-blog/dubbed-the-game-changer-flow-energys-home-generator

PV for schools
www.gov.uk/government/publications/power-to-the-pupils-solar-pv-for-schools
£10m for Community Energy

The number of community owned renewable energy schemes in England could increase, given DECCs new £10m Urban Community Energy Fund. It will give community groups in England the opportunity to bid for grants of up to £20,000, or loans of up to £130,000, to help kick-start their projects. DECC says ‘Community groups can reap the benefits of renewable energy by creating “power hubs” in their area. Installing solar panels on local buildings or factories or building an anaerobic digestion plant to create energy from local waste can save whole communities money’. Community electricity projects will also now get further support under the Feed-in Tariff Scheme, for small-scale projects. For the first time, registered charities will be entitled to the same benefits as other community groups and two community projects (or one community project and one commercial project), each up to 5 MW, will now be able to share a single grid connection and receive separate FiTs. The FIT will also now be guaranteed for an extra six months - giving communities more time to get their project up and running. Community Energy England said: ‘Without risking the integrity of the wider Feed-in-Tariff scheme, this will stimulate community involvement in larger Renewable schemes. It will be a great boost to projects using the split owner ship model under the voluntary protocol for Shared Community Ownership.’

Ethical investment company Ethex has found that renewable energy projects are the most popular type of community investment, with £29m raised for 56 projects since early 2012. DECC

Whatever became of CCS?

The UK Carbon Capture and Storage programme has been moving ahead very slowly, but, in a Commons debate on Nov. 20th, Under-Secretary of State for Energy and Climate Change, Amber Rudd, noted that ‘We have set aside £1 billion to support the first CCS projects in the UK, and we are investing £100 million of that now in the development of detailed engineering and planning designs for those projects. […] We want a strong and successful CCS industry that can compete on cost with other low-carbon technologies in the 2020s, and that deploys up to 13 GW by 2030.’ She added ‘we have made good progress with the White Rose and Peterhead projects over the past year’. The first aims to build ‘the world’s biggest oxyfuel power plant at the Drax site in Yorkshire with full Carbon Capture and Storage […] That will link into the planned development of a CO2 transportation and storage infrastructure called the Yorkshire Humber CCS trunkline, which could have capacity for additional CCS projects in the area and provide the foundation for further CCS projects in the region.’ And Shell’s Peterhead project, ‘could become the world’s first commercial-scale gas CCS project. The proposal is to attach carbon capture technology to the existing gas power plant at Peterhead and transport the CO2 for permanent storage in the depleted Goldeneye gas field.’

Tim Yeo, Tory chair of the Energy and Environment Select Committee, gave it a guarded blessing: ‘Progress in the past 10 years or so has been patchy, to put it no more strongly. The competitions unveiled in 2007 were expected to deliver an operating CCS project by this year, but initially they did not manage to support any projects at all. We had something resembling a lost decade. In 2012, an NAO report on this matter criticised the Government’s handling of the competition, and a second competition, which was announced in that year, is now looking to fund two projects that we hope will be operational between 2016 and 2020. Despite that slightly faltering start, I am pleased with the recent attempts to move a bit faster.’ Though he added: ‘I do not believe that progress has yet been sufficient to enable Governments - here or anywhere- to base their energy and climate change policy on the assumption that an economically viable form of carbon capture and storage will be available in the near future, or, possibly, even the next decade’. Exactly. So why are we backing new gas projects? Labour’s Dr Alan Whitehead said that, given emission limits, ‘we already face the likelihood that known fossil fuel reserves would have to stay in the ground if we do not do something about how we burn them, never mind fracking rocks apart to provide new sources’.

*The £11bn smart meter rollout has been delayed yet again: it now may not start until late 2016. www.telegraph.co.uk/earth/energy/11242115/11bn-energy-smart-meter-roll-out-suffers-fresh-delay.html#disqus_thread

*£10m isn’t much compared to the other funding: see this Ministerial ‘priorities’ speech, which mentions nuclear many times, shale gas a lot, renewables hardly at all: https://www.gov.uk/government/speeches/goldman-sachs-global-natural-resources-conference
**Power out - keeping the lights on**

There is still a large reserve capacity, but with some large old plants closing, like the Didcot ‘A’ coal plant, the UK has found it a bit more challenging to meet demand when there are unexpected outages. The fire at the Didcot ‘B’ gas-fired plant last Oct. briefly reduced capacity by about 600 MW, but it was repairable, and on its own this was not a problem. However the nuclear fleet had also been in trouble, with some unplanned shut downs last year due to faults, loosing all output from one 450 MW reactor at Hunterston B, and from the two 450 MW reactors at Heysham and from another two at Hartlepool, as well as from one 400 MW reactor at Dungeness B (the other was offline for refueling). That’s 2.65 GW of nuclear losses in all. Restarts were put in hand: for the current (daily) state of play see: www.edfenergy.com/energy/power-station/daily-statues

But the boiler cracks found at Heysham and Hartlepool mean that, for safety sake, their output will be reduced 75-80%, i.e. by ~240 MW. If it goes ahead, Hinkley won’t be on line until 2023 at the earliest, so it’s no immediate help. With wind supplying 24% at one point, we’ve made it through the winter (so far) and the plant margin allegedly has remained above 4%, although extra measures were taken: http://utilityweek.co.uk/news/uk-has-a-65-per-cent-supply-margin-says-baroness-verma/1063502#.VEYpLShQRFg and www.bbc.co.uk/news/business-29715796

**So what next?** How can we avoid problems in future? Demand side measures and energy saving can help, but on the supply side, there are many new plants in the pipeline. In addition to the various new offshore wind farms (maybe 2 GW this year if all goes well), and PV (2 GW more this year?), there are also plans for more gas-fired plants, including two 299 MW fast-response open cycle gas in S. Wales, and a third in Bedfordshire, possibly by 2018. Also in the medium term, there’s wave and tidal stream power (maybe 150-200 MW by 2018), plus the 240 MW Swansea tidal lagoon. That could be ready by 2018, if all goes well - Prudential is to inject up to £100m to pump prime this project. Wind and PV are likely to continue to expand rapidly, with maybe over 30 GW of wind by 2020, and 10 GW or more of PV, and a lot more of both after that, with wave and tidal by then moving into the GW range. So there should be no problems with capacity, and, though there will be grid-balancing issues, biomass/biogas fired plants and the new capacity market and demand management can help with that. So can imports on the new grid links - by 2020 there could be 11 GW in all.

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**Demand Reduction**

UKERC has contributed evidence to a Government Inquiry on electricity demand-side measures. It argued that the Government’s current target, identified in the Electricity Demand Reduction Strategy, of 32 TWh/year, was too conservative, as it excluded potential savings in household lighting and appliances. The Governments figure assumes the savings will be delivered through EU product policy-essentially product labeling and standards. That approach of course has its own problems and limits: www.theguardian.com/environment/2014/nov/18/brussels-targets-super-sized-tvs-in-drive-for-energy-efficiency

But UKERC says innovation theory indicates that, in any case, information (via labels) and minimum standards alone are not the most effective policy - they don’t encourage the development, marketing and purchase of new energy efficient products. Where life cycle costs of new products initially exceed those of less efficient products, financial incentives may be needed to allow enough volume production to reduce costs to manufacturers. A combination of standards, information and incentives is needed. But EU product policy has no mechanisms to provide incentives: these need to be created nationally.

*A new domestic smart demand controller: http://www.telegraph.co.uk/finance/personalfinance/household-bills/11196763/250-energy-saving-from-new-black-box.html*
The UK remains a very long way off its 2020 target to get 15% of its energy from renewables. DECCs chart right shows that renewables provided slightly more than 5% of UK energy needs in 2013, leaving a huge gap to close before 2020. The table below shows the expected investment. On land wind tails off… so does biomass. But offshore wind may treble and PV may double, while wave/tidal may quadruple—albeit from a low level.


**UK Climate Targets - the next phase**

The UK has ambitious climate targets, setting the context for the renewables programme, and indeed the nuclear, CCS and energy efficiency programmes, with an overall commitment to an 80% cut in emissions from 1990 levels by 2050. The 2008 Climate Change Act provides a basis for these targets, and introduced a system of 5-yearly carbon budgets. While UK so far emissions are within these budgets, further cuts will be increasingly challenging - e.g. if it doesn’t shut coal plants as planned: [http://www.wwf.org.uk/about_wwf/press_centre/?uNewsID=7370](http://www.wwf.org.uk/about_wwf/press_centre/?uNewsID=7370).

But the 4th carbon budget (2023-27) has been agreed, though it’s controversial: Owen Paterson wants to dump the whole thing! As a condition of accepting it, the government insisted that it should be reviewed. Though it has accepted the advice from the Committee on Climate Change (CCC) that it should not be relaxed. However it’s a political battle ground.

* The UK Energy Research Centre (UKERC) has been reviewing the feasibility of the UK’s planned low carbon pathway to 2030, and the uncertainties that could have an impact on its achievability. Prof. Jim Watson, UKERC’s Research Director, outlined their views at UCL. Video: [www.youtube.com/uclenergyinstitute](http://www.youtube.com/uclenergyinstitute) and [www.youtube.com/user/UCLISR](http://www.youtube.com/user/UCLISR).

**Fracking fine** ‘There is an impressive amount of scientific evidence that, with a robust regulatory regime, the risks to the environment and public health are low. We concluded that, with such a regime in place, the environmental risks are small, whereas the benefits, if shale gas development can take place, are substantial.’ Chair, Economic Affairs Select Committee [www.publications.parliament.uk/pa/ld201415/ldhansrd/text/1411040002.htm#14110462000324](http://www.publications.parliament.uk/pa/ld201415/ldhansrd/text/1411040002.htm#14110462000324)

The UKERC however insisted that it was too soon to say if shale gas would be significant or cheap in the UK and that there was too much hype: [www.bbc.co.uk/news/uk-politics-30013668](http://www.bbc.co.uk/news/uk-politics-30013668)

**It gets crazier** A wind farm near the Sellafield nuclear site has been opposed on safety grounds. [www.whitehavennews.co.uk/news/fears-voiced-over-wind-turbines-near-sellafield-1.1174620](http://www.whitehavennews.co.uk/news/fears-voiced-over-wind-turbines-near-sellafield-1.1174620) But ex-chief scientist Sir David King says we ‘might well’ be able to do without nuclear, and rely on renewables, if energy storage was developed: [www.telegraph.co.uk/earth/energy/nuclearpower/11244499/Nuclear-power-may-not-be-needed-says-top-atomic-advocate.html](http://www.telegraph.co.uk/earth/energy/nuclearpower/11244499/Nuclear-power-may-not-be-needed-says-top-atomic-advocate.html) This from someone who has pushed nuclear hard..
Hinkley fallout

On the 3.2 GW Hinkley European Pressurised-water Reactor project, now cleared to proceed, the European Commission said that the initial investment guarantee fee, which EDF would have paid to the UK Treasury, was too low for a project with this risk profile. So it was ‘significantly raised’, reducing the subsidy by more than £1bn. But there are still big financial risks, which taxpayers and consumers may yet be called on to meet if things go badly: this £24bn project will be seen as too big to allow to fail. A 4 year construction-delay grace period has, it seems, been built into the draft contract. But even by 2023, when, all being well, it’s meant to start up, gas prices may well be low (if you believe the rhetoric on shale gas).

More likely, prices for wind & PV will be lower. Either way, Hinkley could become a ‘stranded asset’, but with consumers still having to pay the high CfD price for 35 years - and the possibility of a review of the price upwards after 15 and 25 years if operational costs are higher than expected. What a deal! It seems that 16 commissioners voted in favour of the project deal, just ahead of the 15 votes needed for approval. Evidently a near run thing: http://www.bbc.co.uk/news/business-29536793 But contracts have yet to be signed. And, buried deep in euro-commission minutes from 8 Oct., 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’. So even the £24bn may be a bit of a fiction. All in, with insurance, capital loan costs and inflation included we’ve seen £34bn cited.

And with overrun costs, it could be more: completion of the EPR being built in France, already 5 years late, has been delayed by yet another year, adding to Areva’s financial woes. www.independent.co.uk/news/business/news/treasury-rebuked-by-eu-over-hidden-nuclear-costs-9819900.html

*German* environment minister Barbara Hendricks said the decision was ‘utterly wrong’: ‘As far as I know, the nuclear power plant Hinkley Point C will receive guaranteed prices for more than 30 years, which are considerably higher than our feed-in tariffs that are being decreased successively’. Germany, which aims to get 80% of its power from renewables by 2020, may join Austria (near 80% already) in challenging the EC decision. They, like Denmark (aiming for 100%), may fear that investor funding for their renewables programmes could be undermined by heavy state subsidies for nuclear projects elsewhere. No new nuclear projects are planned in France, but Areva welcomed the EC’s ‘positive signal for nuclear investors in Europe,’ which it said will help ‘consolidate the leadership of French nuclear industry in the third generation nuclear reactor market.’ But would any government other than the UK’s get away with it? And risk undermining their renewables?

*In the UK*, a right-wing backlash on Hinkley say that shale gas and even solar would be cheaper: http://www.telegraph.co.uk/finance/newsbysector/energy/11150015/Solar-energy-and-shale-are-the-future-not-costly-nuclear-power-plants.html And Owen Paterson said ‘big nukes’ weren’t the way ahead. Labour hinted that it would seek a better Hinkley contract. More militantly, for a green view, see: www.theecologist.org/News/news_analysis/2592833/hinkley-c-will-cost-britain-dear-if-its-ever-built.html and more technically: http://www.carboncommentary.com/blog/2014/10/22/cambridge-nuclear-engineer-casts-doubt-on-whether-hinkley-point-epr-nuclear-plant-can-be-constructed/ Meanwhile, the National Audit Office is looking at the Hinkley deal: http://t.co/8qeRumZU0 And the Times claimed a special ‘secret’ government review is looking at whether Hinkley can really go ahead as planned: www.thetimes.co.uk/tto/business/industries/utilities/article4272779.ece It’s all looking a bit fraught..

Hold your breath

On averaged data it shouldn’t happen, but this may explain cancer clusters: www.theecologist.org/News/news_analysis/2574389/radioactive_spikes_from_nuclear_plants_a_likely_cause_of_childhood_leukemia.html The numbers are small, but it may be refueling that does it. You can see which units are off-line at: www.effenergy.com/energy/power-station/daily-statues But it doesn’t say exactly when they are refueling. Meanwhile some old plants struggle to stay on: www.telegraph.co.uk/finance/newsbysector/energy/11169625/Nuclear-reactor-heat-turned-down-to-stop-boilers-cracking.html See p.11 above - their reduced output will put more strain on the grid. Error! Hyperlink reference not valid. www.heraldscotland.com/news/environment/alarm-after-serious-breakdowns-at-ageing-hunterston-nuclear-plant.25565033 And Sellafield clearly has ageing problems, with photos published by the Ecologist showing ‘cracked concrete tanks holding water contaminated with high levels of radiation, seagulls bathing on the water, broken equipment, a dangerous mess of discarded items on elevated walkways, and weeds growing around the tanks’. All very worrying, with no long-term waste store in sight. http://www.theecologist.org/News/news_analysis/2611216/leaked_sellafied_photos_reveal_massive_radioactive_release_threat.html
2. Global developments
PV solar romps ahead - but mostly in Asia

**PV solar** is accelerating rapidly, to around 150 GW total, due in part to the spectacular price reductions - see the IEA log-log ‘learning curve’ chart below. But take up in the EU has fallen due to cuts in FiTs. Not so in Asia: see the chart left. China (the source of many of the cells) and Japan are roaring ahead. But so too is the USA.

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**Figure 1:** Grid parity for PV with storage in the German market, including feed-in tariff (FiT).

LCOE = electricity price comparison

- **FIT**
- **Electricity price**
- **LCOE PV**
- **LCOE PV + storage**

What next?
If batteries continue to get cheaper, then PV + storage may lift off in a big way at the domestic scale: it is already happening in Germany. It may take longer for utility scale PV + storage to be viable. Large CSP, with molten salt heat stores, still has the edge, depending on location. NREL say it has a 5-6% price advantage over ‘non-store’ plants. But large PV/CPV is catching up.

Bioenergy - 14% of total...

Not everyone backs biomass, given the emission/land-use issues, but the World Bioenergy Association says bioenergy contributes over 14% of global energy, and its ‘WBA Global Bioenergy Statistics 2014’ report has useful data on the global situation, by area and source: overall solid biomass supplied 89% of total bioenergy, and over 90% of bioenergy is used for heat - the rest for transport and electricity. 70% of biofuel production is in the Americas, while Europe led in biomass energy conversion, Asia and Africa in biomass for direct heat. www.worldbioenergy.org

... but wind still the best

Taking account of all lifecycle energy requirements, wind Power has one of the lowest emission impacts of all energy supply options, though CO2 negative BECCs could beat it.

And odd view The Energy Matters web site seems to be strongly pro-nuclear. A recent post by Euan Mearns, who runs it, relayed the chart left and rehearsed all the standard arguments against renewables, ending up with ‘There are a very large number of engineers and scientists who envisage nuclear fission as the near term bridge to a nuclear fusion future’. Its rendition of BP's data is hard to reconcile with IRENA’s view that renewables now supply 18% of global energy (not 9% as shown left) and could reach 30% or more by 2030. But BP is very conservative. Its 2014 Energy Outlook says renewables will only supply 14% of global electricity by 2035.

Though it also says, including biofuels, renewables will have a higher share of primary energy than nuclear by 2025. www.bp.com/energyoutlook Clearly views differ:

For a more radical global green energy review see:


EU - weak energy targets set

In January last year, the European Commission (EC) suggested that the EU should cut carbon emissions by 40% but only raise the share of renewables to 27% by 2030, up from 20% by 2020. That is pretty unchallenging. Greenpeace has pointed out that it would mean that renewables growth would drop from almost 7% p.a. in this decade to under 2% in 2020-30. It took a while for the EC to propose an energy efficiency target for 2030, to replace the current ‘20% by 2020’ target. One perverse issue is that higher levels of efficiency would undermine the EU Emissions Trading Scheme - the carbon price would fall as there would be less CO2 to trade! But in July it proposed a 30% by 2030 energy saving target. Greenpeace saw it all as ‘gutless’. It had come up with its own 2030 targets - a 45% share of renewables, 40% energy savings (compared to 2005) and a 55% cut in domestic CO2 emissions (compared to 1990). That, it said, would cut annual 2030 fossil fuel imports dramatically - gas by 35% and oil by 45%. As coal power plants were phased out in the 2030s, coal imports would cease altogether before the end of the next decade. But it was not to be, and we’re stuck with a proposed 30% overall reduction non-mandatory target. Or less...

http://ec.europa.eu/energy/efficiency/events/2014_energy_efficiency_communication_en.htm

Denmark: on-land wind the cheapest source

Onshore wind power is the cheapest form of electricity generation in Denmark, according to a new research study released by the Danish Energy Agency. New onshore wind plants due to come online in 2016 will generate at just over 30 øre (3 p)/kWh. Offshore wind power is in second place, with new centralized coal and natural gas plants and decentralized combined heat and power, at almost nearly 60 øre (6p)/kWh. Solar and new large dedicated and converted biomass power stations, and decentralized biomass, are estimated to be the most expensive, all at 85-90 øre (9 p)/kWh. PV may yet do better, but Denmark has been a leader and a big investor in wind energy since the 1970s. In December last year, wind met more than 50% of the country’s electricity demand for the first time. www.energymarketprice.com

* A bit of a concern, minks farmed near a wind project have reportedly suffered health problems with ultra sound blamed: www.masterresource.org/2014/06/health-effects-from-wind-turbines/

France: offshore floating wind and energy saving

With France now committed to accelerating renewables to get to 40% of power by 2030, while ramping down nuclear by 25%, offshore wind is being pushed hard. The EU-funded Floatgen project will install a 2 MW demonstrator floating turbine at France’s SEM-REV test site, off Le Croisic, by the end of the year, if all goes to plan. The test site was originally earmarked for the WinFlo demonstrator, but that project is under review. Meanwhile progress is being made with the Vertiwind 2 MW direct drive, vertical-axis floating turbine (pic left), designed for waters up to 200 metres deep. Also see: http://cleantechnica.com/2014/10/14/french-mashup-to-launch-floating-wind-turbines/

Funding for projects like this is to come from a new tax regime, with a €10 bn package of tax breaks, low-cost loans and bonuses to boost investment in renewables and cut oil and gas bills. On the energy saving side, homeowners will be allowed to deduct 30% of the cost of thermal insulation from their taxable income, up to a maximum of €16,000 per couple. A bonus will also be available to those who buy an electric or any other clean car, raised from €6,700 to €10,000 if they scrap a diesel car at the same time. Electric car owners will also get a 30% rebate on the cost of installing a charger at home. A €1.5 bn fund to subsidise ‘zero-waste’ and ‘energy-plus’ communities, or buildings producing more energy than they import sources, will be set up. PV solar is being pushed too, though from a low base. http://uk.reuters.com/article/2014/07/29/uk-france-energy-idUKKBN0FY20A20140729

*But France has cut its goal of providing smart meters to 95% of power customers by 2020 to 90%
German green energy costs

A very critical report on the ‘Development and Integration of Renewable Energy: Lessons Learned from Germany’, by Finadvise in Switzerland for the US Edison Electric Institute, says: ‘Over the last decade, well-intentioned policy makers in Germany and other European countries created renewable energy policies with generous subsidies that have slowly revealed themselves to be unsustainable, resulting in profound unintended consequences for all industry stakeholders. While these policies have created an impressive roll-out of renewable energy resources, they have also clearly generated disequilibrium in the power markets, resulting in significant increases in energy prices to most users, as well as value destruction for all stakeholders: consumers, renewable companies, electric utilities, financial institutions, and investors.’ It’s a pretty damning review, claiming that ‘because FITs levels were administratively driven and slow to adapt to the evolution of the solar market, the incentive became excessively generous, which initiated an uncontrolled development of renewables, which, in turn, created unsustainable growth with a myriad of unintended consequences’. The report says the FITs cost over €412 bn to date and might reach €884 bn (€ 680 bn) by 2022. It says household electricity prices in Germany have more than doubled, from €140/MWh in 2000 to over €290/MWh in 2013, while wholesale prices in Germany for base load have fallen dramatically from €90-95/MWh in 2008 to €37/MWh in 2013. As a result of all this ‘German utilities have seen their stock plunge by nearly 45% since 2010’. While there’s no doubting that it cost a lot and needed adjustment, that’s now underway, with a new premium market replacing guaranteed FiTs for new projects and the EEG surcharge levy cut last year to €61.7/MWh from €62.4. This year PV will get €27/MWh, biomass €16, onshore wind €12 offshore wind €5. http://renews.biz/77455/germany-lowers-re-surcharge/

An optimistic interpretation is that the early pioneering phase resulted in consumers helping to launch a massive 70 GW+ if renewables using FiTs, with, as a result, unit costs falling*, so the costs of the next more commercial phase will now be less. But it’s not clear if the new market system will continue to cut costs. Certainly this report doesn’t give any evidence for that- it’s just anti-FIT! More likely the new regime, and the cuts, will just slow capacity growth. www.finadvise.ch/files/germany_lessonslearned_final_071014.pdf  * http://bit.ly/1AiJDRn

More German coal use - a temporary episode?

* www.worldnuclearareport.org Much has been made of the rise of coal use in Germany. But Schneider & Froggatt* say that the key driver was ‘the price signal on the European power exchange market, not the nuclear phase-out’. They claim that ‘as in other countries, cheap coal prices on the world market (mainly because efficiency, gas, and renewables displaced so much coal from the U.S. market), coinciding with spiking natural-gas prices and a collapsed EU carbon market, led to perverse effects: while German power production from natural gas plants dropped by 25% during 2010-2013, lignite plants boosted production by 10% over the same period and coal plants by 4%’. They conclude that ‘these effects, however, are expected to be brief and temporary’, pointing out that that ‘the coal uptick, particularly in 2013, was not driven by domestic demand, since efficiency and renewables were both rising; rather, it was entirely to serve record German power exports, chiefly to Holland and France’. That in turn was because ‘Europe has a large structural overcapacity, so in the absence of a significant carbon price, there has been an increasing incentive to operate existing lignite and coal fired power plants. Germany does not have any capacity problems, on the contrary, the country never exported more than in 2013 with 72.2 TWh or 33.8 TWh net, a 46% increase in net exports over the previous year, and due to its highly competitive wholesale prices, (which renewable power has sharply reduced in the past few years), Germany is the only country that consistently is a net exporter of electricity to France.’ Are they right? What happens next? Between 2010-13 gross electricity use fell by 2.9%, renewables rose by 45% to 25.3%. If that trend continues, on the way to 80% renewables and a 50% energy use cut, coal use should fall. Though short-term it may depend on gas prices!

Global roundup

**Brazil:** Renewables are rising, but so are fossil fuels, see right, partly due to rising demand, as in all the ‘BRIC’ countries:
http://yearbook.enerdata.net/?utm_source=newsletter&utm_medium=email&utm_campaign=%5BYBY-0714%5D-Yearbook-Launch-EU

**India:** The renewables programme in India, another key BRIC country, has suffered from uncertainties and policy changes, but may get moving under the new government, though the 2014 budget allocation was tiny compared with the $1.7bn allocation to nuclear.

**China** is the BRIC country pushing renewables most. **Russia** (see below) the least, though that’s changing: http://www.renewableenergyworld.com/rea/news/article/2014/07/russias-state-supported-renewable-project-auction-heavily-favors-solar?cmpid=WNL-Wednesday-July16-2014

**USA projects:** Focusing on innovation, the US Dept of Energy is funding work on thermo-chemical heat storage using sand-like particles called perovskites, instead of molten salts to store energy, for use with **CSP** plants: http://social.csptoday.com/technology/two-sunshot-awards-investigate-perovskites-csp-thermochemical-storage There’s also some interesting work on **PV balancing:** http://emp.lbl.gov/publications/integrating-solar-pv-utility-system-operations

*The big **CSP** plant in the Mojave desert seems to be killing birds that fly into the focused beam: www.contractostatimes.com/environment/ci_26355983/emerging-solar-plants-scorch-birds-mid-air

**Energy is SE Asia** - Malaysia, Thailand, Burma and Australia

In an Ashgate study, *Energy, Governance and Security in Thailand and Myanmar*, Australian academic Adam Simpson explores the key role played by environmental groups in these very different political regimes: www.ashgate.com/isbn/9781409429937

A study of **Australia** is also needed - it seems to want to link up with New Zealand and Canada to oppose what it sees as dangerous growth limiting climate policies like Obama’s: http://au.ibtimes.com/articles/555242/20140610/australia-global-warming-climate-change-emissions.htm#.U5b2Q1X1tFx

See this slightly oblique historical Blog from the author of a new book on *Energy in Australia*:
http://euanmearns.com/germanys-energiewende-as-a-model-for-australian-climate-policy/ The current situation is dire..

**Japan** Some utilities, worried about grid links, are blocking new PV/renewables. http://on.ft.com/1rxkHP

Renewables in Russia - not much interest

Russia’s renewable energy potential is vast: the wind resource in the north has been put at 350GW. A 2003 IEA report said renewables with economic potential correspond to about 30% of total primary energy supply, while the technical potential was estimated to be more than 5 times greater than its energy needs. So how has it done? Hydro supplies 16% of its electricity and that may rise (only about 20% of the potential has been tapped so far), but new renewables have been sidelined - with just 200 MW of solar and wind installed so far. The aim is to get 4.5% from wind and solar by 2020 - maybe 6 GW. Not too great.

Renewable Energy World (REW) ran an interesting article last year noting that renewables were mainly only seen as relevant to remote regions. It quoted Cody Thompson, at IFCs Advisory Services for Europe and Central Asia: ‘There has been some success in the regions on the retail market, specifically solar plants in Yakutia and wind stations on Kamchatka. We view isolated regions such as these as having great potential for the development of renewable energy, as they often rely on expensive and heavily subsidized diesel generation.

As such, renewable technologies can compete economically even without additional support from the government, when compared to the true cost of diesel generation, including fuel costs and subsidies.’ 

But REW also quoted Ivan Dmitrij Graciov, chair of the Russian Duma (Parliament) Energy Committee, who was pretty dismissive: ‘Sakha, like Kamchatka and Sakhalin, our remote and isolated regions, sure, don’t have many energy alternatives due to the adverse climate conditions. But developing solar capacity there cannot be seen as a single solution, especially in the light of the mind-blowing cost at $3 per kWh.’ He went on: ‘In general, I don’t like to see when the hype about green energy compromises conventional energy sources’. For Sakha, he explained, building a floating nuclear plant in Tiksi could be ‘perhaps the best solution’ long-term. Economically, nuclear was ‘much smarter and substantiated than developing the expensive non-hydro renewable sources’.

Interestingly though, REW noted that Crimea already has around 400 MW of PV and wind capacity installed - twice that in the whole of Russia. You might think the annexation of this sunny region into Russia could change the picture. But Grachiov said no: ‘The Crimean solar generation cost, now at a whopping 0.34 euro cents, is largely fed with the budget money. This is pretty insane taking into account that Ukraine has been on the brink of bankruptcy for quite sometime. For many, it is first a vivid example of super-expensive solar energy, not of the benefits it gives.’ So not much may happen there. See Box.

Overall Grachiov was unapologetic about the low status given to green energy: ‘The 200 MW we are receiving now from non-hydro generation may seem to some like our backwardness’, but he asserted it was expensive: ‘The advanced Germany spends $40 billion in green subsidies annually. I don’t think this is a right thing to follow’.

So new renewables may remain on the margins, and even the low 2020 target may be missed. The Energy Forecasting Agency, quoted in the IFCs 2011 Waking the Green Giant report, pessimistically said only about 0.3-0.4 GW of new renewables may be installed by 2020: the 4.5% target might not be met until 2030, with maybe only 6.1GW in place then.


Things have improved since then, nearly 500 MW of PV being given support for the period 2015-18 (see p19 above). But the main future focus is nuclear, with 22 GW in place and plans to double that. 


* Oil & gas remain central for now, but on the nuclear disposal/reprocessing issues see these video: http://greenworld.org.ru/techa_eng.mp4 and http://greenworld.org.ru/video/techa_eng.mp4
Green energy access for Africa

EED’s ‘Energy Access Review’ looks at energy poverty in East Africa. It argues that the key problem is that incomes are so low, e.g. although 93% of households in Kenya own a mobile phone less than 30% of the same households have direct access to electricity. See left: students using street lights to study. (Credit: Paul Romer).

Big grid solutions may be fine for urban areas, but in sparsely populated rural areas, far from the grid, ‘stand alone’ off grid projects are spreading: EED says that ~850,000 solar home systems have been installed in Africa with Kenya hosting ~320,000 systems. For remote but more populated village areas, it sees local mini-grids as the way ahead. See: www.eedadvisory.com/download/8328/ and http://digital.renewableenergyworld.com/renewableenergyworld/20140910#pg53

More discussion of green energy policy and implementation issues:

The big picture: In the 2102 Greenpeace Energy [R]evolution scenario for Africa, by 2050, 92% of electricity comes from renewables, with wind at 200 GW, CSP 161 GW and PV 155 GW. Hydro was at 50 GW.

China & US join in carbon cuts

In a surprise joint announcement, the US and China have committed to cut emissions, though the US plan is more forthright, aiming to cut emissions by at least 26%, and hopefully 28%, from 2005 levels, by 2025, while China only says it will seek to cap emission rises by about 2030. But it would aim to get 20% of its energy from non-fossil fuels by 2030, an update to the existing 15% by 2020 target. Some felt China was getting off easily, but it’s still progress: www.theguardian.com/environment/2014/nov/12/what-does-china-need-to-do-to-meet-its-carbon-pledge

Morocco

Concentrating solar power is growing fast, with 2GW planned by 2020. A hybrid gas/20 MW solar CSP power plant opened at Ain Beni Mathar in 2011. The 160MW Noor 1 CSP plant, the first of 3, with molten salt heat storage, is being built at Ouarzazate. Airlight Energy’s plant (pic) at Ait Baha, has concrete troughs and a pebble heat store. http://www.richardpriestley.co.uk/morocco-pioneering-solar/

China’s offshore wind

China appears to have pulled back on its offshore ambition after a government admission last year that it would struggle to hit its target of 5 GW by 2015 and 7.1 GW by 2016. WPO Intelligence says that China only plans to install 1.5 GW in 2015 and may only reach 3.9 GW cumulative by 2016. Even so, it will move ahead of Germany and the UK: see annual MW additions, above left: www.windpowermonthly.com/article/1301372/windpower-data-offshore-installations-2014-16

Note that it sees the USA entering the race at long last - overtaking the Belgians & Dutch. The German projections seem ambitious given recent cutbacks. And where’s Denmark?

Also see DECCs new 2050 energy calculator for Japan, following on from their earlier ones for China and India: http://blog.decc.gov.uk/2014/07/29/japans-low-carbon-navigator/ It says Japan could cut emissions by 80% by 2050, with or without nuclear, but would need CCS.
French n-waste site plan

France is looking at how to deal with its nuclear Waste. Although decommissioning will mean some extra waste will have to be dealt with, the phase out of some of its nuclear plants, under the new ‘25% less nuclear’ energy policy, will reduce the production of nuclear wastes from spent fuel: its current nuclear programme generates over 1kg per person per year. But France already has a lot to deal with. So far most of it has been kept at reactor sites or at the Cap de Hague reprocessing plant. But following initial public consultations on the concept, detailed feasibility studies for Cigéo, the proposed French underground disposal site for radioactive waste, are being carried out, prior to an application to regulators for a go ahead in 2017. Some test tunnels have already been dug, and a pilot project to test disposal techniques is proposed. See Box right. There has been some local opposition and it was suggested that ‘having a six-month debate on a project that will last 100,000 years’ was a little odd, given the environmental and ethical issues.

http://www.bbc.co.uk/news/science-26425674

www.andra.fr/index.php?id=edition_1_5_2&recherche_thematique=3

Cigelo waste project

The full thing, with a large network of tunnels in clay, at a site about 150 miles east of Paris near Bure in the Meuse/Haute Marne area (the Champaign district!), is meant to be the final resting place for around 2700 cubic metres of high-level radioactive waste and about 40,000 cu. m of long-lived intermediate-level waste. Altogether that’s 99% of the radioactivity from France’s nuclear power generation so far. The design will allow for reversibility, at least for ~100 years, so future generations could more easily remove the waste, should they decide to do so. If it gets the go ahead, it’s been claimed that the first limited phase of waste loading might start in 2025, but the full thing wouldn’t be ready for use until the 2070s. By that time it could take spent fuel (which would have cooled /decayed enough by then); however the current assumption is that it will be reprocessed fuel waste, with the plutonium extracted. A 2012 estimate was that it would cost over €16bn. No foreign waste can be taken, under French law.

* Meanwhile drones have been buzzing French nukes: http://t.co/cGvUAnUuQj

Hot potato

The German government is still working on draft legislation to enable a start on a search for a final disposal site for nuclear waste. In the UK, 2040 is the due start date- but with no site in view!

Australia has waste problems, with the Mucktay site on Aboriginal land now blocked.

US n-waste: Yucca back! $15bn so far...

Despite the Obama’s efforts to kill it off, a tiny bit of new funding for licensing the Yucca Mountain high-level nuclear waste repository was included in the draft fiscal 2015 Energy Appropriations Act - $205m to ‘support continued adjudication’ of the licence application. The Administration wanted to ‘zero out’ funding for the project. But the House of Representatives appropriations committee said: ‘inconsistencies can be seen in the Administration’s proposal to reduce core research funding for nuclear energy, which will continue to be a vital base load electricity source in future years, and the Administration’s willful disregard of the federal government’s legal responsibilities regarding Yucca Mountain’. Support was also proposed for the stalled/contested MOX programme. There’s also a draft $12.6 bn loan guarantee solicitation for advanced nuclear projects.

EU Subsidies needed

Last year, the Czech Republic, Bulgaria, France, Hungary, Lithuania, Poland, Romania, Slovakia, Slovenia and the UK petitioned the European Commission, noting that ‘market failures’ were preventing new nuclear build from supporting EU goals for energy security, and calling for a ‘level playing field’ for all low-emission sources in the EU. ‘National support mechanisms, consistent with the Internal Energy Market and the competition rules provided by the Treaty on the Functioning of the European Union may therefore be needed’, i.e. nuclear also needs subsidies! Maybe one aim was to ensure the EC looked favorably on the UK’s proposed nuclear CfD/loan guarantee funding. Others could then follow. Well that now seems to be how it is. But the French EPR has been delayed yet again - by another year. * Russia plans to start building 3 sodium-cooled fast neutron reactors before 2030.
3. Forum *Odds and ends for you to chew on* [Comments welcome]

**IGov The Innovation and Governance for a Sustainable Economy**

IGov’s website, based on work at Exeter University led by Prof. Catherine Mitchell, is a useful source of analysis of UK energy policy. If you want to explore the deadening complexities and shortcomings of UK policies and institutions, and what the positive alternative might look like, see this post: [http://projects.exeter.ac.uk/igov/working-paper-change-and-inertia-in-the-uk-energy-system](http://projects.exeter.ac.uk/igov/working-paper-change-and-inertia-in-the-uk-energy-system)  


**Local energy**

In the small village of Wedmore in Somerset a local community co-op has created a 1 MW solar plant, with 4000 PV panels providing local power. [http://news.pv-insider.com/photovoltaics/power-people/](http://news.pv-insider.com/photovoltaics/power-people/)

**Facts and fiction**

The energy and climate debate is awash with views, some of which reflect biases. Take this bleak view of nuclear power and Fukushima from the US: [http://ecowatch.com/2014/06/14/fukushima-children-dying/](http://ecowatch.com/2014/06/14/fukushima-children-dying/)  

It’s hard to know if this is over stated, or if UNSCEAR et al are right. Whose info and analysis can you trust? What about this wider perspective on nuclear from Aljazeera, which seems very reasonable: [http://america.aljazeera.com/opinions/2014/6/nuclear-energy-independenceeurope.html](http://america.aljazeera.com/opinions/2014/6/nuclear-energy-independenceeurope.html)  

But views can differ and be polarized, e.g. the otherwise useful Energy Collective’s US web site has carried some contrarian views from Willem Post. He’s critical of renewables and linked policies, and favours nuclear: [http://thenergycollective.com/posts/published/user/61439](http://thenergycollective.com/posts/published/user/61439)  

The UK based *Energy Matters* web site also often has some good material e.g. see [http://euanmearns.com/do-we-have-enough-uranium-to-go-nuclear/](http://euanmearns.com/do-we-have-enough-uranium-to-go-nuclear/) (*Though scroll down for Post’s input*)  


Nothing wrong with that - we need to keep sharp. And it’s reasonable for there to be a spread of viewpoints: it’s always worth looking at a range views, including ‘outlier ‘ones!  

But some with deviant views can be tiresome, offensive and time wasting. Though we would be the last to try to shut them out. Even REF and the GWPF!  


Nevertheless, occasionally, when faced with inane negative comments e.g. about the energy needed to build wind turbines being more than they will produce, some hard facts help lift the fog: ‘US researchers have carried out an environmental lifecycle assessment of 2 MW wind turbines moored for a large wind farm in the US Pacific Northwest…. they conclude that in terms of cumulative energy payback, or the time to produce the amount of energy required of production and installation, a wind turbine with a working life of 20 years will offer a net benefit within five to eight months of being brought online.’  

[http://www.sciencedaily.com/releases/2014/06/140616093517.htm](http://www.sciencedaily.com/releases/2014/06/140616093517.htm)  


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Wind farm fires... a new dig at wind

Wind turbine fires are ‘ten times more common than thought’, a study by Imperial College and Edinburgh University says. The Telegraph quoted Dr Guillermo Rein, from Imperial’s Mech Eng Dept: ‘Fires are a problem for the industry, impacting on energy production, economic output and emitting toxic fumes. This could cast a shadow over the industry’s green credentials. Worryingly our report shows that fire may be a bigger problem than what is currently reported.’

The study used data compiled by the Caithness Windfarm Information Forum (CWIF), an anti-wind lobby group, which recorded 1,328 accidents involving wind farms globally between 1995 and 2012. Of these, 200, 15%, involved turbines catching on fire, implying 11.7 fires per year. But the study, published in the journal Fire Safety Science, backed CWIF’s view that the true number is far higher. It points out that the wind industry body, Renewable UK, has admitted there were 1,500 wind farm accidents and incidents in the UK alone between 2006 and 2010, while just 142 individual accidents in the UK were documented in CWIF’s database over the same period. So the actual number was around 10 times higher, as could be the number of fires, i.e. maybe around 117 p.a. in the UK. Wind Power Monthly pointed out, the assumption that fire episodes are proportionate may not be valid: ‘there is likely to be a different rate of reporting for different accidents, with turbine fires a more newsworthy incident than a gearbox breakdown’. It also said the risk of fire had to be put in perspective. It ran a (different!) quote from Imperial’s Guillermo Rein: ‘In terms of fire hazard, the figures are almost negligible. It is a one in 10,000 probability of a fire. By comparison with other energy industries, fire accidents are much less frequent in wind turbines than other sectors, such as oil and gas, which globally has thousands of fire accidents per year.’

The study sees the main causes of fires as lightning strikes, electrical malfunction, mechanical failure, and errors with maintenance. It warns that high winds can quickly fan a fire inside a turbine housing: ‘Once ignited, the chances of fighting the blaze are slim due to the height of the wind turbine and the remote locations they are often in’ with there being a risk that ‘under high wind conditions, burning debris from the turbine may fall on nearby vegetation and start forest fires or cause serious damage to property.’ RenewableUK said it welcome any work that helped improve safety and reliability, but felt that the reliability of some of the data sources used might be questioned and noted that ‘the operational practices and design standards are such that the actual safety risks associated fire are extremely low. No member of the public has ever been injured by a wind turbine in the UK.’


Transports of eco-delight

We don’t cover transport issues much in Renew (we’re swamped with info and there have to be some limits), but amusing recent highlights included Tesla going ‘open source’ on their up-market electric roadster; www.teslamotors.com/blog/-/out-patent-are-belong-you and Harley Davidson is developing an all-electric prestige bike: www.theengineer.co.uk/home/blog/an-electric-harley-davidson-shows-how-mainstream-evs-have-become/1018801.article? All a long way from what most people need and can afford, but its part of the mood change - making green transport options part of the social zeitgeist. Though probably much more relevant are the various electric/hydrogen/fuel cell/biogas car, bus and truck options. And now air power cars! www.dailymail.co.uk/sciencetech/article-2679990/Car-runs-air-New-hybrid-greener-electric-rivals.html Plus of course trains, bikes and feet.
Nuclear is the Answer self-selecting open poll

In a Vision Prize poll last year, open to ‘climate scientists and other scientists or researchers with relevant expertise’ and backed by two US Universities and the UK IoP’s Environmental Research Web, a strongly anti-coal (64%) but even stronger pro-nuclear view emerged. Of the nearly 100 scientist who participated, 71% agreed with the view that nuclear power is a critical component of any realistic plan to achieve climate stabilization, while 67% backed the view that renewables will not be able to scale up fast enough, these views being based on the public statement made by Dr Ken Caldeira, Dr Kerry Emanuel, Dr James Hansen and Dr Tom Wigley in Nov 2013. http://environmentalresearchweb.org/cws/article/opinion/57973

Is this how most scientists feel? This poll is suggestive, but doesn’t help to tell us for sure: given that it is by open invitation, it’s hard to know if its representative e.g. is it meant to reflect views globally? In the USA? What type of scientists? And being open invitation, it invites bias! It’s possible for lobby groups (on either side) to high-jack open polls like this (making sure members and colleagues enter votes), so we can end up mainly measuring lobbying strength! But if, for whatever reason, it’s even partly representative, then these results on nuclear/renewables are worrying. Would the same results emerge if you asked engineers? Or the wider public? Properly structured statistically balanced public opinion polls, with large samples (1000 +), have usually indicated strong opposition to nuclear in most but not all countries - the US and UK being examples of the latter - coupled with strong support for renewables everywhere. But then, for some, nuclear is still the answer - in fact we should have done it long ago, then all would be well: http://euanmearns.com/how-to-cut-emissions-and-how-not-to/

PV: go west for more?

Prof. Ralph Gottschalg, Loughborough University, says angling solar panels east and west, rather than south, would increase the amount of electricity generated overall, as it avoids shadowing and allows for more cells to be put in any given area, and also (a bit more credibly, we feel), if westerly, allows you to collect energy when demand is higher - in the early evening. As we have reported, that’s what they are thinking about in the US and Germany. www.dailymail.co.uk/news/article-2708808/Half-solar-panels-Britain-facing-wrong-way-face-east-west-not-south.html#ixzz38oQk62IS

Coal bed methane Shale gas isn’t the only worry, but maybe mine gas is OK. It’s less of a threat, given that otherwise it may escape and it’s a powerful greenhouse g

Corporate eco-horrors An interesting Friends of the Earth Australia report. The 121st edition of their Chain Reaction newsletter looks at ‘Emerging technologies and corporate control’ covering GM, synthetic biology, nano - and geo-engineering horrors and the way the renewables and climate change issues are subverted. Whoever said FoE were single-issue campaigners! www.foe.org.au/sites/default/files/CR%23121-web-3MB.pdf

Energy prices The profits of, and prices charged by, the UK’s Big 6 keep rising. They say their costs are rising and green taxes too. And industry is hit. But for some big users there are let-outs (see link below): no wonder the EU-ETS doesn’t work. Though in climate terms, energy ought to cost everyone more. www.gov.uk/government/publications/eu-emissions-trading-system-compensation-for-indirect-costs-in-2013-to-2014-and-2014-to-2015-guidance

Our favorite anti-wind diatribe from last year: www.dailymail.co.uk/debate/article-2713830/Lunacy-sea-As-Ministers-agree-world-s-biggest-wind-farm-Brighton-Britain-succumbed-catastrophic-folly.html