Renew on line 139  May - June 2019

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 adopts an independent critical approach. It should not be taken to necessarily reflect the views of the Open University

Renew was for many years produced by Prof. Dave Elliott and Tam Dougan, then based at the Open University, as a NATTA membership subscription journal, with, from issue 100 onwards, a free shorter web version, Renew on Line, also being produced. Now run by NATTA independently of the OU, the latter still continues, delivered as this free bimonthly Blog. In parallel, the full PDF bimonthly version of Renew is now offered as a password protected on-line version, available on a contract basis to students and staff on relevant University courses. The full version of Renew draws on the News sections of Renew On Line, so there’s some duplication, but it also has additional Features, Reviews & commentary sections. For a full guide to NATTA’s various offerings, and access to our free annual end of year review, see: http://renewnatta.wordpress.com

Don’t forget our short Renew Extra blog, now posted monthly focusing on general energy issues, not related to renewables. It’s at: http://newrenewextra.blogspot.co.uk/

Contact: d.a.elliott@open.ac.uk


Recent Energy Books by Dave Elliott:


If urls open oddly, refresh or paste in
1. UK Renewables...

Offshore wind: 30% of power by 2030

The UK government has confirmed a sector deal with the offshore wind industry to help it reach 30 GW of installed capacity in UK waters by 2030, up from just under 8.2 GW currently. The government will also support investment in the supply chain & energy infrastructure, and work with further education institutions on skill development and retraining, enabling workers to move between offshore energy sectors. It aims to increase the number of skilled jobs in the UK offshore wind sector from 7,200 to 27,000 by 2030. The government has also challenged the sector to ensure women hold at least 33% of these jobs by this date, with an ambition of reaching 40%, up from 16% today. The sector deal also aims to help the UK offshore wind industry boost global exports five-fold to £2.6 bn a year by 2030. Also see Box.


Blockchain for local PV: www.solarpowerportal.co.uk/news/edf_to_launch_solar_storage_and_blockchain_pilot_in_brixton

New Geothermal probe in Cornwall: https://marketbusinessnews.com/geothermal-energy-potential/197677/

Battersea Power station in London has started up again with 3 gas-fired CHP engines (5.3 MWe), three 10 MWh gas-fired boilers, 7 thermal stores & six 4 MWe chillers

Energy Security overview www.power-technology.com/features/energy-security-uk/

‘Everybody thinks security means that you don’t have enough power, but actually all of the power interruptions are due to failures on the transmission system. It follows that distributed generation actually located on distribution systems is probably more valuable to security.’ Prof. Mike Grubb

Batteries battering the status quo: storage can do away with demand peaks:
https://realfeed-intariffs.blogspot.com/2019/03/three-independent-led-developments-that.html

Centrica backs smart energy systems: storage & integrated domestic PV & heat pumps:


Shares of total UK renewable electricity generation 2017:
Scotland 51.7%, NI 34%, England 26%, Wales 20%.

Wales
The equivalent of 48% of its electric power use was met from 3.2GW of RE in 2017. The devolved Welsh Government want to see that rise to 70% by 2030. And to 100% by 2035 says the Institute of Welsh Affairs, with 4GW of tidal, wave, and floating wind, 2.7GW of PV, 2.5GW of wind onshore, 1.7 GW offshore, plus biomass/hydro.
www.bbc.co.uk/news/wales/47543322

Power cut https://inews.co.uk/news/environment/why-is-uk-energy-consumption-dropping-faster-than-the-rest-of-the-eu/

Cost cut ‘The cost of renewable technologies such as offshore wind has fallen dramatically, to the point where they now require very little public subsidy and will soon require none.’ BEIS Secretary of State Greg Clarke, Jan
www.gov.uk/government/speeches/statement-on-suspension-of-work-on-the-wylfa-newyddnuclear-project
The latest UK energy and climate projections

The latest UK energy and climate projections indicate that the UK will fail to meet its 2023-27 carbon reduction targets and do even worse in 2028-32.

Final energy use up 3% in 2018, primary energy demand fell. Nuclear is seen as building up over time… gas declining. www.gov.uk/government/publications/updated-energy-and-emissions-projections-2018

But beware hubris: a UKERC study of energy analyst, corporate leader/practitioner’s views about the likely changes ahead warned that ‘Any one-sided broad commitment to a disruptive or continuity-led energy transition logic is likely to reinforce old blind spots or create new ones, undermining overall policy effectiveness’. See Box right. Download the report here

Rather than relying on projections, it might be better to be a bit cautious about expectations e.g. on the likely take up of domestic demand side management: www.sciencedirect.com/science/article/pii/S221462961830447X?via%3Dihub but then there are things happening on the ground. For example, in Scotland a local smart grid system is being trialed on Orkney: www.bbc.co.uk/news/uk-scotland-north-east-orkney-shetland-47785050. And in Sussex too: www.pv-magazine.com/2019/04/18/moixa-to-build-virtual-power-plant-as-first-phase-of-uk-smart-energy-project. And in Wales a newly electrified railways could be powered by community-owned solar and battery storage as part of a new study: www.solarpowerportal.co.uk/news/community_solar_to_power_welsh_railways. Lots of individually small steps, but they may add up, as part of a wider energy transition. With a vast payoff!


Uncertain Transition ‘On the overall character of the energy transition, there was a roughly even divide between those anticipating a broadly disruptive or broadly continuity-led transition. The results suggest caution in “reading-off” policy priorities based on high-level narratives of either disruption or repurposing, the merits of which depend on the specifics of the problem at hand and the evolving evidence base. For independent analysts and advisors, there is a need to understand the range of available alternative solutions, irrespective of their disruptive or repurposing credentials. In its recent report on the role of hydrogen in a low carbon economy, the UK Committee on Climate Change noted that there was no automatic “sunk costs” case for repurposing the gas grid. Our results suggest that there is no automatic case for any disruption or repurposing as the defining logic of the UK energy transition.’ UKERC press release

In Northern Ireland, wind energy has led to a £4 p.a. payback to consumers since 2000: www.businessgreen.com/bg/news/3073950/wind-generating-real-savings-for-northern-irelands-energy-consumers

Direct Action The Extinction Rebellion youth campaign aims to change the world. ‘We are going to change the definition of what is politically possible so that it is what is scientifically necessary’ said Green MP Carolyn Lucas, backing Greta Thunberg’s call to ‘listen to the scientists. I am just speaking on behalf of them. I’m trying to say what they have been saying for decades’. But sadly ‘zero carbon by 2025’, an XR aim, is maybe not realistic. Though 50% renewable power globally by 2030 might be-and then 100% all energy by 2050. Is that fast enough? www.theguardian.com/environment/2019/apr/21/long-road-to-zero-emissions-uk

The mass demonstrations & school strikes evidently had an impact, shifting the mood. However, Boris Johnson, said he was ‘utterly fed up with being told by nice young people that their opinions are more important than my own’). He did support the UK setting a goal to get to net zero emissions by 2050, though he said that it could be achieved ‘not through hair-shirted leftyism but solid Tory technological optimism’. He added that the UK had a good track record on cutting emissions compared to other countries, so protestors should ‘take their pink boat to Tiananmen Square, and lecture them in the way they have been lecturing us’.


There was also a House of Commons debate, initiated by Labour’s Ed Miliband. Energy Minister Claire Perry said she would do what she could, but noted that ‘the Committee on Climate Change was unable to recommend a net zero target when previously we asked for that advice, because the committee did not believe it could be done cost-effectively or, indeed, that we had the technology’. Maybe that’s changed now. But her subsequent statement just recited the official story so far: www.gov.uk/government/speeches/climate-change-protests
Still no news on SEG  PV power export deal still uncertain  
Energy Minister Claire Perry says the FiT tariff would ‘probably not’ be extended to coincide with the start of the Smart Export Guarantee. It wasn’t, and with no plans in sight, there’s a big gap: [source](www.solarpowerportal.co.uk/news/uncertainty_reigns_over_smart_export_guarantee_rates_and_floor_price)

**Policy news**

**PV FiT rescue bid** [source](www.energyvoice.com/otherenergy/194045/peers-condemn-ministers-over-ditching-of-solar-payment-scheme)

**FiT fiddle** £4m error [source](www.energylivenews.com/2019/02/27/sse-pays-out-705k-after-overstating-feed-in-tariff-costs/)

**Next CfD** The next Contract for Difference capacity auction starts at the end of May. It has a 6 GW ‘Pot 2’ allocation, available for projects to be delivered in 2023-2024 and 2024-2025, subject to an overall £60 m price cap. Offshore wind is likely to dominate, despite not really now fitting in the Pot 2 ‘less established’ category. Neither does on-shore wind, which may be let in for remote projects on Scottish Islands, but would be welcome, as would more support for AD/CHP biomass, which is also eligible. Though what’s really needed is support for tidal stream, so far deemed too costly...And then a Pot 1 round for onshore wind! [source](https://renewablesnow.com/news/cks-3rd-cfd-auction-planned-to-be-launched-on-may-29-643112/)

**Climate Change Committee wants no new home gas links**
They want off gas-grid rural homes to use heat pumps & by 2025 all new-build urban homes to use heat nets, not gas. But the housing stock is mostly so poorly insulated, neither option will work well! CCC’s Prof. Julia King said ‘poorly-built new homes are going to need to be retro-fitted (re-insulated) 10-15 years down the line. It’s a total waste of money because retro-fitting is 4-5 times more expensive than building it properly in the first place. This is a scandal comparable to the VW emissions scandal. Lots of people are paying far more on their gas bills than they ought to be because their new homes are poorly built.’ [source](www.bbc.co.uk/news/science-environment-47306766)

...and the government agrees
The Chancellor’s March Spring statement nevertheless confirmed the policy: the government wants to end all fossil-fuel heating in all new homes by 2025. But it will also expand green gas! See Box right.

It could ‘triple power demand’
**Aurora** rather undermined it all by saying a switch over to electric heat pumps could mean more than triple power demand by 2050: [source](https://uk.reuters.com/article/uk-energy-demand/uk-power-demand-to-soar-on-plans-to-end-gas-home-heating-research-idUKKCN100003)

**N. Ireland RHI heat subsidy to stay**: [source](www.bbc.co.uk/news/uk-northern-ireland-47321461)

But with some big cuts in the scheme [source](https://uk.reuters.com/article/uk-energy-demand/uk-power-demand-to-soar-on-plans-to-end-gas-home-heating-research-idUKKCN100003)

**Smart meter** dodgy plug [source](www.energyvoice.com/other-news/194103/misleading-smart-meter-ad-banned/)

48% don’t survive retailer switch [source](www.which.co.uk/news/2019/03/half-of-smart-meters-stop-working-when-you-switch-energy-firm/)


**Future of Mobility: Urban Strategy**
New governments report sets out its approach to working with innovators, companies, Local Authorities & other stakeholders on new urban mobility technologies. It’s also launched a £90m competition for cities to deliver Future of Mobility Zones, which follows £60m awarded to 10 cities via the Transforming Cities Fund: [source](www.gov.uk/government/publications/future-of-mobility-urban-strategy)
Wind all the way?

Offshore & onshore wind farms generated 36% of UK power in a week in March, more than any other power source. Of course there may be less other times, but Aurora Energy’s data for 8-14 March showed that 35.6% of the UK’s power was provided by wind, compared to 31.2% by gas, 21.3% by nuclear, 6.7% by biomass, 2.6% by coal, 1.8% by hydro, 0.8% from other sources. Offshore wind alone generated 21.4% of power during the week - more than nuclear: www.rechargenews.com/transition/1731699/uk-offshore-wind-generates-more-than-nuclear

It has been suggested that offshore wind will account for the lion’s share of the bids in the next CfD round (AR 3), while the rest, including tidal & biomass, will account for a 25% share. Ed Reed, from Cornwall Insight, said: ‘In capacity terms, offshore wind dominates with it representing just over 7.8 GW of the 10 GW of all the potential projects that could enter AR3. Cornwall Insight’s initial analysis suggests, that 1.9-3.2 GW of offshore wind capacity could be procured in the auction at the current Administrative Strike Price (ASP) levels of £56/MWh (2023-24) and £53 MWh (2024-25).’

He claimed that the lowering of the strike price in offshore wind caused by the savings made in efficiencies will make it hard for other technologies. ‘Offshore wind has been able to benefit from large leaps in efficiencies with increased turbine size and larger individual projects all helping to boost outputs. As a result, this dominance should be of little surprise particularly when this sector has come out on top in previous rounds. Unfortunately, the scale of the offshore wind sector alongside its relatively low ASP in comparison to other technologies will see other sectors struggle to win a CfD.’

www.energyvoice.com/otherenergy/195088/next-cfd-round-will-be-dominated-by-offshore-wind-research-firm-claims/

The Floating Wind Action Group has been set up through trade body Renewable UK, in partnership with Scottish Renewables, to set out the case for large-scale use of the tech., with the focus the white paper the UK government is producing on its future electricity strategy: www.energyvoice.com/otherenergy/195506/group-to-push-for-more-uk-floating-wind-projects

Wave & Tidal Chair of the Marine Energy Council Sue Barr says the sector was having to compete with proven technologies, such as offshore wind: ‘If any developer wants to go into the CfD round they will be competing with the likes of offshore fixed-wind, where we’ve seen prices much lower than marine technology can achieve at the moment. Both tidal stream and wave power are effectively locked out of the UK energy market by a system which means they must compete with proven technologies. If we as a country really want to reap the benefits of building these sectors in the UK, now is the time to act.’ She suggested a separate auction round should be held for emerging techs. She also proposed an ‘innovation power purchase agreement’ model (see later) to aid, and provide a market for, small-scale tidal & wave projects. She added: ‘For the government, it’s also worth looking at the economic benefits, where are the jobs created? Currently, we don’t manufacture offshore wind turbines in the UK but the leading wave & tidal developers are based here.’


Opposing views ‘Green taxes, smart meters, profit margins adding £550 to energy bills’


and its reaction to the CCC plan: www.telegraph.co.uk/family/life/first-came-wood-burners-now-gas-hobs-will-banned-next/

The Spring Statement (see above) also got mixed reactions, on carbon offsetting especially:


Radical agenda A left view http://bright-green.org/2019/02/15/6-things-we-learned-at-building-a-green-new-deal-for-the-many/

Targets of achieving carbon neutral power generation by 2030 and 2050 for a carbon neutral economy are doing the rounds within the Labour movement, as also in the US Green New Deal. Along with calls for transition aid: www.energyivenews.com/2019/03/11/energy-workers-must-be-supported-through-renewable-transition/

CCC agenda A very good overview of the issues: www.theccc.org.uk/2019/03/19/chris-stark-towards-net-zero/ See below
Community Renewables struggle but on to version 2.0
‘In 2014, the government set out a strategy for a million homes to be powered by community energy schemes by 2020. Four years on, that vision has been abandoned with only 67,000 homes powered by community energy. The scrapping of the strategy & the reduction in feed-in tariffs means community energy groups are now struggling to develop viable projects.’ So says the Community Energy Manifesto produced by a coalition of 20 community energy projects and affiliated groups. Community Energy England said ‘Community energy schemes break down barriers, showing local people how renewable energy can work and benefit everyone’. The Manifesto calls on the government to account for the wider economic and social value of community-scale projects in its energy market design review, and wants new pilot programmes & capacity building to help scale up.

A parallel Green Alliance report, ‘Community Energy 2.0’, says ‘the UK’s energy transition, spurred by regulation, is moving fast & disrupting the existing centralised energy system. New economic value in this emerging order will lie in providing clean, flexible, cheap & local energy to households & businesses.’ Community projects can help. ‘As trusted intermediaries between consumers and the energy system, they can ensure consumers get maximum value from the transition. By targeting energy programmes, particularly energy efficiency, at the right house holds, they can protect the poor & the vulnerable from being left behind. By aggregating domestic energy assets and providing ancillary services to grid operators, they can generate new revenue to benefit local communities. And, as active owners & partners of renewable energy generation, they can develop new business models to accelerate the decarbonisation of the UK economy.’

Micro Grids
It looks to some innovative local microgrid ideas, noting that ‘the peer to peer market in Germany, enabled by the high uptake of rooftop solar, is estimated at £4 bn a year’. Microgrids are platforms where consumers pay local prosumers to generate their energy. This it says ‘stimulates the adoption of decentralised renewables and contributes to faster decarbonisation. Community scale microgrids benefit the local economy as trading profits stay in the community instead of transferring to large utilities.’ It looks at the Brooklyn Micro-Grid (BMG) blockchain based system that facilitates data transfer and energy trading alongside a physical grid of wires that connect the homes participating in the trade. ‘The microgrid remains connected to the larger grid to ensure reliability but can decouple during times of system stress. In the BMG, trades occur within short time windows with consumers and prosumers bidding into the market with their maximum and minimum buying and selling prices. In effect, this model is a miniature version of the wider energy market.’ It says ‘in the future, the UK’s homes will be able to function as integrated units, actively participating in the energy system & responding to real time price signals’. See Box right for its UK examples.

Innovations in the UK
1. Demand side aggregation Start-up Social Energy is partnering with Duracell to install and aggregate the 350MW cumulative capacity of 3kW and 6kW home battery storage units by 2020 in the UK. The company has secured a contract with National Grid to provide firm frequency as a service. It claims its software can better monitor demand and export and import electricity at best prices.
2. Peer to peer trading Energise Barnsley has won the Ofgem Sandbox competition to establish whether it is possible to develop a tariff or trading system to allow households without solar PV to purchase exported solar energy generated by their neighbours. The Northern Powergrid could act as a balance and checking mechanism for a P2P retail energy platform like this.
3. Vehicle to grid charging
OVO energy has produced a 6KW vehicle to grid (V2G) charger. As part of a trial, it is offering drivers of Nissan electric vehicles the opportunity to discharge excess electricity from their cars back to the electric grid to help supply energy at times of peak demand. Large utilities like EDF and E.On are investing significantly in creating virtual power plants made up of several thousand electric vehicle batteries.
4. Time of use tariffs
Octopus energy has launched an Agile Octopus tariff, a time of use tariff that rewards demand flexibility in response to external price signals. The company claims the average customer on the tariff would save £188 per year by shifting their consumption away from peak times.
5. Flexibility platforms
Pico, a flexibility trading company, has developed a popular trading platform for buyers & sellers of flexibility services. All 6 distribution network operators have joined this platform to trial innovative ways to locate and trade DER flexibility.
6. Energy Service Companies (ESCOs)
Companies like Smartklub are offering to optimise community level distributed energy systems including electric vehicles, batteries and rooftop solar.ESCOs work with local utilities but replace them as the locus for customer relations.

Orkney saga
How one local project has been stymied
www.green-alliance.org.uk/resources/Community_Energy_2.0.pdf
www.green-alliance.org.uk/resources/Community_energy_manifesto.pdf
Good Energy policy overview from CCC
CCC’s Chief Executive, Chris Stark outlined the story so far: ‘In 2008, the first action of the newly-independent Committee on Climate Change was to advise on the appropriate 2050 target for emissions. At the time, there was no globally agreed temperature goal. So we judged, based on the available climate science, that an appropriate global climate objective would be 2°C, and to avoid an extreme danger threshold of 4°C. An 80% reduction in greenhouse gases by 2050, from their 1990 level, was our best estimate of the appropriate UK contribution to that goal. We said it was “challenging but feasible” and that it carried a cost-of 1-2% of GDP - which was affordable to avoid a much greater economic cost in the future.’
Progress since then has been quite good. Indeed, it is often said that the UK is a global leader on climate change, with a 42% fall in production emissions from 1990 levels, while growing the economy by 70%. However, Stark said, there was much more to do, and to some extent so far we had only focused on the easy stuff - decarbonistaion of electricity supply: ‘we will shortly run out of coal-fired power plants to close’. Moreover, that phased, sector by sector approach was no longer viable: ‘If there was ever an idea that we could approach this as a “sequential” transition - moving from Power, to Transport, to Heat, to Industry & Agriculture - then that thought needs to be re-examined. Tougher targets imply a different kind of sectoral strategy. Bluntly, we will need to move quickly to decarbonise every sector in unison.’
Fortunately, technology has come to the rescue (see Box) with lower costs. ‘In our retrospective on the last ten years, it’s now clear that the costs of some of the key transition technologies are much lower than we thought they would be in 2008. Remarkably, if we put the right steps in place, we can look forward to the transition in some sectors carrying negative GDP impact - that is, it will be cheaper to decarbonise them than not.’ By contrast, the carbon market has not been as effective as was hoped: ‘Twenty years ago, we might have had the luxury of allowing prices and carbon pricing to do the heavy lifting required, but we have been too slow globally to respond to climate change - and we are now up against hard, scientific deadlines. So, it is vital to consider how regulation can be deployed to drive more rapid change - often by providing a firm backstop date for a transition for example, to encourage a swifter market response.’
So what next? ‘A transition to a near zero carbon economy is now technically achievable - credible scenarios now exist to achieve near-full decarbonisation in most sectors. This is genuine progress. Electrification with zero carbon supply takes us much of the way - and there are now credible alternatives, like hydrogen, for those applications where that strategy won’t work. And even in those sectors where emissions look set to continue, we can match emissions with greenhouse gas removals. So it is possible. But that does not mean it is feasible. The scale of the change is enormous, and this transition must take place at remarkable (although not unprecedented) speed.’ And in terms of a socially-equitable Just Transition ‘while the economic costs of decarbonisation overall may be smaller than we thought - potentially allowing the UK to go further for the same cost envelope, I doubt we will make further progress without a thorough review of how these costs are distributed - and the appropriate strategic policy levers. It follows that we must consider the appropriate balance of 1) cost for the Exchequer; 2) costs on the consumer; and 3) economy-wide costs. And we must make use of the right tools - carbon pricing, tax, financial incentives, information or regulation. But I think we can also say that for many of the key technologies we can increasingly consider policy’s role as enabling investment rather than subsidising - and that makes me more optimistic about achieving deep emissions reductions than I have been before.’
www.theccc.org.uk/2019/03/19/chris-stark-towards-net-zero/
What now? Greenpeace want more

A new Greenpeace briefing says electricity demand in 2017 was around 300 TWh. The CCC expects this to increase to 365 TWh by 2030. However, this doesn’t allow for a phase-out of diesel and petrol vehicles by 2030. The Government really needs to be planning for total power demand in 2030 of about 379 TWh. Only about 47 TWh of this could be met by gas in order not to exceed the 50gCO2/kWh objective. So 332 TWh would need to be met by low carbon generation by 2030. Nuclear is only likely to supply about 35 TWh by then - and that is assuming that Hinkley Point C has started up. Greenpeace think hydro and bioenergy will supply 5 TWh each by 2030, CCS nothing, and also, very pessimistically, nothing from tidal by then. So that leaves 287 TWh to find. By 2020 wind and solar will be generating about 82 TWh, so we are going to have to get about 205 TWh more from wind and solar. If the onshore wind moratorium goes and we get on with solar, Greenpeace estimates we will still need 39-45 GW of offshore wind, not the 30GW proposed in the Government Offshore Wind Sector Deal - which is ‘woefully inadequate’ says Greenpeace Director John Sauven. And instead of building more gas-fired power plan, Greenpeace suggests using more flexible balancing technologies. By 2030, they note, Imperial College & Poyry say deployment may, in a scenario of high levels of renewables, need to be as high as 15 GW for power grid interconnection, 38 GW of storage and 18 GW of Demand-Side Response (DSR). Imperial suggest that levels of DSR & storage may in practice need to be only a quarter of these levels, since high levels of deployment in one tech would mean less required of the others.

Greenpeace’s proposed targets for 2030

<table>
<thead>
<tr>
<th>Technology</th>
<th>Target</th>
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<tbody>
<tr>
<td>Offshore wind</td>
<td>45GW</td>
</tr>
<tr>
<td>Solar PV</td>
<td>40GW</td>
</tr>
<tr>
<td>Onshore wind</td>
<td>30GW</td>
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<tr>
<td>No Tidal, or CCS by then</td>
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More offshore wind

‘If the government needs more (capacity than in the Sector Deal) then within reason I think we can deliver. The nice thing about offshore wind is we have established a track record of delivery, on time, on budget, & a good safety record.’
Matthew Wright, Orsted:
http://electricityinfo.org/news/energy-policy-278/

‘It is time to aim higher and seize the opportunity that offshore wind brings.’
SSE CEO, Alistair Phillips-Davies:
https://renew.co.uk/51156/sse-urges-uk-to-raise-offshore-ambition/

Plan B now needed

Rachel Reeves, Chair of the Business, Energy and Industrial Strategy Select Committee says ‘...it’s vital the Government comes forward with a Plan B to plug the energy gap. This alternative plan must ensure security of supply and address the pressing need to decarbonise the UK’s power generation. Renewable energy offers significant opportunities for UK jobs, for business, and for industry and Government must take a fresh look at creating the right environment for attracting investment in future energy capacity, including renewables.’
http://electricityinfo.org/news/energy-policy-278/

Solar helps

www.solarpowerportal.co.uk/news/solar-helps-bristol-council-meet-climate-targets-two-years-early

Getting there

SSE is to treble its renewables output over the next decade to 30TWh p.a.: www.current-news.co.uk/news/sse-to-treble-renewables-output-slash-carbon-intensity-in-sdg-pledge

ScottishPower is actively pursuing future offshore wind projects in England & Scotland as part of its £6bn investment plan: www.offshorewind.biz/2019/03/08/scottishpower-going-after-more-uk-offshore-wind/

Marine energy funding plan

https://renew.co.uk/52088/marine-sector-publishes-uk-blueprint/ The ‘UK Marine energy 2019: a new industry report sets out the sector’s innovation power purchase agreement (iPPA) and innovation Contracts for Difference (iCfD) policies to provide market incentives for the technology. It proposes government-backed iPPAs for wave and tidal stream of up to 5MW with the scheme capped at 120MW overall. The first iPPA projects would receive £290/MWh, diggingress by 15% at every 30MW allocation. The iCfD is conceived as a bridging mechanism for wave, tidal, new floating wind & advanced conversion technologies of 5-100MW unable to compete with standard offshore wind in regular CfD allocation rounds. www.scottishrenewables.com/publications/uk-marine-energy-2019-new-industry/
Negative prices - as costs falls, so does income
Renewables are getting cheaper, so, at times, power costs can fall dramatically, to the point where, as costs falls, so does income

It could hurt all projects
According to Renewable Energy Magazines rendering of Cornwall Energy’s analysis ‘the impacts are not limited to subsidy-free renewables reliant on the wholesale price, but also to Renewable Obligation (RO) stations that are also exposed to wholesale prices. Also, while Contracts for Difference (CfD) generators are largely protected against price cannibalisation, any generators from Allocation Round 2 and onwards will not receive their subsidy payments if day-ahead auction prices turn negative for six consecutive hours or more. Furthermore, the low income makes it hard to borrow money to invest in new plant.
Renewable Energy Magazine’s coverage ended up saying ‘Negative pricing, both in the BM & on the wholesale market, is a trend that seems set to grow and is one to watch out for as more intermittent renewables capacity comes online, a lot of it under a CfD. Given other changes likely to impact the sector in the next ten years - from vehicle to grid to peer-to-peer trading - the wholesale market as we know it already looks set to dramatically change’:
www.renewableenergymagazine.com/panorama/uk-negative-imbalance-price-phenomenon-predicted-to-20190329

Accelerating innovation towards net zero
Vivid Economics & the UK Energy Research Centre look at conditions and policy approaches under which the cycle of innovation occurs, and could be sped up, to achieve a net zero target. They see innovation as ‘learning that occurs during R&D, demonstration and the early stages of deployment’, so that the lessons it draws from its case studies therefore look at ways to accelerate learning related to deployment as well as during R&D. But it takes time. The report says ‘moving from invention to wide spread deployment can take many decades, yet only around three decades remain to meet the net zero emissions goal’. It also needs and consistent support. The report says that it is vital to ‘create new markets to catalyse early deployment and move towards widespread commercialisation’ and notes that in Denmark and elsewhere ‘Feed-In-Tariffs for wind projects were vital to move towards industrial scale deployment’. But it’s also keen on Carbon Capture Utilisation and Storage, although it notes that it ‘is not proceeding on the innovation pathway required to meet the IEA’s Sustainable Development Scenario’: www.ukerc.ac.uk/publications/aldersgate-report-net-zero.html

E.ON steps in to help PV prosumers while they await the new FiT export tariff replacement: www.energylivenews.com/2019/04/01/e-on-offers-cash-to-consumers-exporting-solar-power-to-the-grid/

Community power plug - its local!
https://environmentjournal.online/articles/interview-mark-luntley-energy4all-on-democratising-energy/

But still a way to go overall Fossil & nuclear fuels still play a major role - see chart left:
https://theconversation.com/despite-good-progress-100-low-carbon-energy-is-still-a-long-way-off-for-the-uk-114949
Wylfa, Oldbury out, Moorside too

But Wylfa rescue mooted [https://uk.reuters.com/article/uk-britain-nuclearpower-uk-wylfa-nuclear-project-could-still-be-deployed-in-2030s-energy-secretary-idUKKCN1PV1C0] A very long shot

Though plans to build new reactors at Sizewell and Bradwell continue. The 3rd stage of public consultation on Sizewell C began in January, with objectors including some famous names: [www.bbc.co.uk/news/uk-england-suffolk-47650353]

Meanwhile CGN, China’s state-backed nuclear company, says it could bring forward plans for Bradwell by a couple of years to fill part of the gap left by Wylfa, Oldbury and Moorside: [https://uk.reuters.com/article/uk-hitachi-nuclear-china/china-to-help-plug-uk-nuclear-power-gap-as-japanese-plans-falter-idUKKCN1PB1GM]

Hinkley may still face issues [https://realfeed-intariffs.blogspot.com/2019/02/new-funding-crisis-looms-for-for.html]

SMR homes needed

To ‘replace’ the 8 GW of nuclear projects that recently fell through would require 20 or more small modular reactors. That may be the minimum needed to get the alleged economies of scale from mass production. Some could perhaps go on existing nuclear sites, but even with two to each site, that would still probably mean finding new sites. Who will volunteer to host them? [www.cityam.com/275166/tiny-nuclear-reactors-could-spring-up-across-britain-2030]

Arguably SMRs are unlikely to prosper in the UK, or most places: [https://theecologist.org/2019/03/11/obituary-small-modular-reactors]

Vintage AGRs: Hunterston ready for retirement [https://realfeed-intariffs.blogspot.com/2019/02/scottish-minister-pressed-to-back.html]

while the BBC allegedly got it a bit wrong: [https://realfeed-intariffs.blogspot.com/2019/03/the-real-story-about-stricken.html]

But the cracks are real enough: [www.bbc.co.uk/news/uk-scotland-47485321]

See pic right. Time for it to go into decommissioning?

Sustainable decommissioning [www.world-nuclear-news.org/Articles/Viewpoint-The-benefits-of-sustainable-decommission]


RAB funding The government is reviewing the viability of a regulated asset base (RAB) model. It sees it as a ‘sustainable funding model’, based on private finance for future nuclear projects. In essence, the idea is to allow power companies to charge consumers for capital projects before they are built- they take the risk! So it’s PFI with a vengeance. The government intends to publish its assessment of a nuclear RAB ‘in the summer’ after consultation as part of the Infrastructure Finance Review announced in parallel with the Spring Statement: [www.gov.uk/government/consultations/infrastructure-finance-review]

Not everyone loves the idea: [https://realfeed-intariffs.blogspot.com/2019/03/hammond-floats-scheme-to-offer-many.html]

Labour to bail nuclear out! [https://labour.org.uk/press/tory-energy-cancellations-risk-power-20-million-homes-rebecca-long-bailey/]

That didn’t go down well with Toke either: [https://realfeed-intariffs.blogspot.com/2019/03/labour-undermines-renewable-energy.html]

Sun blast: ‘the lights will go out’ [www.theguardian.com/news/865411/mps-fear-electricity-shortage-as-power-use-falls! See our Forum]

Next: Fusion? If you are believer [www.world-nuclear-news.org/Articles/First-Light-Fusion-commissions-pulsed-power-device]

Fusion R&D proofed against Brexit: [http://world-nuclear-news.org/Articles/UK-fusion-scientists-secure-new-funding-despite-Brexit]

Childs play [www.theguardian.com/environment/2019/feb/22/hoy-12-said-to-have-created-nuclear-reaction-in-playroom-lab]


UK Nuclear news

An artist’s impression of the AP1000 reactor project proposed at Moorside in Cumbria, next to Sellafield. The two (optional!) glass towers would create a rainbow effect in the sky. Toshiba pulled out last year: [https://wiseinternational.org/sites/default/files/NM872-873-final.pdf]
2. Global News and Developments

Some future views

BPs annual dose of conservative thinking

BPs annual Energy Outlook as ever has renewables only making a small primary energy contribution - only around 4 billion tones of oil equivalent by 2040, i.e. 15%, or including hydro, 22% combined. New renewables do grow rapidly, faster than any thing else, and coal & oil take a big dive, but gas remains king. Nuclear stays low. All this is based on primary input energy, not final delivered energy.

But its rapid transitions scenario renewables hit 29% (38% with hydro) of energy by 2040

REnewables share of power generation

Fuel shares in power

It looks better in power terms- near 30% excluding hydro (at maybe 16%) but it’s still well behind projections by IRENA, IEA etc


Demand levelling off - green growth

McKinsey Global Energy Perspective Report 2019: ‘Energy companies should be planning for an industrial revolution driven by renewables. By 2035, renewables (solar & wind) will account for more than 50% of global power generation; electric vehicles will be the low-cost option for car, van and small-truck drivers; oil demand will be declining; and gas demand will have peaked. Total energy demand will be plateauing despite a growing global economy and a still-rising population.’ www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2019

But its scenario still only has ‘renewables and other fuels’ at 34% of primary energy by 2050. Pretty timid stuff for 2050. Even BP said 38% by 2040 under its ‘rapid transition’ scenario. To put this all in perspective, IRENA says renewables could supply 60% of total global energy by 2050. More on that in the next Renew. But Jacobson et al say 100%! The EU target is 32% by 2030…

A new more peaceful green energy world?

IRENA’s new publication ‘A New World - The Geopolitics of the Energy Transformation’ is very optimistic, with IRENA’s Director General saying that a transition from fossil fuels is ‘a move away from the politics of scarcity and conflict to abundance and peace with new opportunities for many countries’. Certainly, the geographic concentration of fossil fuels in just a few countries has had a significant impact on the wealth & security of many nations. An energy transformation driven by renewables could bring changes just as radical in scope & impact with a democratization of energy. But that won’t be automatic - there may also be conflicts over access to renewable resources, since they too are not distributed equally round the world.


LUT also has a bold new output: www.lut.fi/web/en/news/-/asset_publisher/lGh4SAywhcPu/content/lut-university-research-shows-an-economically-viable-pathway-to-a-global-carbon-neutral-electricity-system-by-2050  See below

Energy Efficiency - a good bet

Renewables are mostly getting cheaper, but energy saving still has an edge, as an updated chart (left) from the American Council for an Energy Efficient Economy shows. Though the gap has narrowed. See their original 2014 study: wind & utility scale solar now do much better. But nuclear is still well out of it!

https://aceee.org/press/2014/03/new-report-finds-energy-efficiency-a

Electricity demand fell in 18 out of 30 IEA member countries in 2010-17


166 companies globally back ‘100% renewables’: http://there100.org/companies

But it all takes time

www.sciencedirect.com/science/article/pii/S0301421518305901

ICL says to deal with urgent climate change with new energy tech, you can’t move fast from the early R&D phase to full scale adoption - it takes decades. So don’t talk just about the need for more R&D, talk about more support for developed techs:


...and a pessimistic view from GMO

www.energyvoice.com/oilandgas/194764/the-world-is-not-on-a-sustainable-path-bp-chief-exec-says/

Renewables will boom, but not fast enough to avert climate change - that seems to have become a standard BP/industry line.

...and soil productivity is falling too - while population booms. Fun eh? But maybe overstated - we can do better…

Jeremy Grantham’s grim White paper: www.gmo.com/europe/research-library/the-race-of-our-lives-reinvested/

Offgrid power

A major help

www.forbes.com/sites/woodmackenzie/2019/03/04/how-off-grid-energy-access-is-shaping-the-energy-transition/

...and Gloomy WEO

Few countries ready for Transition

Renewables are still doing well….

EU News

..but much more needed say Sandbag/Agora

More EU renewable capacity, especially wind & solar, to meet its 2030 energy targets:

They point to modelling by the European Commission (EC) that shows renewables must reach 57% of electricity production by 2030, up from 32.3% last year. See chart below. In EC modelling for how this could be achieved, wind more than doubles from 11.8% in 2018 to 26% by 2030. In its 2018 Long Term Strategy, the EC envisages wind growth from 183 GW in 2018 to 350 GW by 2030 and solar growth from 117 GW to 320 GW:


There’s also a push to raise the 40% by 2030 EU CO2 cut aim to 55%—see Box

Falling wholesale power costs

The OECD Nuclear Energy Agency’s new report (see later) on the cost of nuclear & variable renewable energy (VRE) includes this interesting statement: ‘Wholesale electricity prices have declined by 59% in Germany between 2008 & 2015 and by 57% in Sweden between 2010 & 2015. In the same period, the electricity share of VREs has increased by 11% in Germany and by 7.5% in Sweden. In both countries, the deployment of low marginal cost renewable energy has been the largest individual driver for the electricity price decrease: VRE deployment alone would have caused an electricity market price reduction of 24% in Germany and of 35% in Sweden.’


North America-Europe Power Grid link

The most direct route is between Canada and the UK—what would the EU make of that! And Trump!

Another 100% renewable EU scenario

It can be done for 2050, but would need a lot of biomass, and grid links, and would cost 30% more:
www.sciencedirect.com/science/article/pii/S0306261918312790

Germany - up and away
Its still doing well on renewables (right) and reliance on coal is to end by 2038, but there’s some resistance to more wind: www.cleanenergywire.org/news/german-wind-industry-worry-about-public-resistance-installations-slump?
But should all this power & money (€60bn) be used for self-driving/electric vehicles? www.telegraph.co.uk/technology/2019/03/03/german-car-industry-invest-60bn-next-3-years-electric-self-driving/

France
And its new energy policy is debated www.climatechangenews.com/2019/02/08/france-vows-renewable-energy-target-2050-and-may-revive-offshore-wind-idUKKCN1Q40LE

Spain
It plans to generate all the country’s electricity from renewable sources by 2050. Under a draft bill prepared last year, it will encourage the installation of at least 3,000 MW a year of renewable capacity such as wind farms and solar plants. It generated 40% of its mainland electricity from renewable sources in 2018, and the expansion plan will require investment of 235 billion euros between 2021 and 2030. All the nuclear plants will go by 2035: see Nuclear News below: www.reuters.com/article/uk-spain-energy/spain-plans-to-close-all-nuclear-plants-by-2035-idUSKCN1Q212W

Denmark

Greece
Aims for 32% renewables, one third energy savings, in a €35bn transition, with lignite use cut: www.euractiv.com/section/energy/news/greece-vows-35-billion-investment-for-energy-transition/
But who knows what will happen re the gas field off Cyprus with Greece & Turkey at loggerheads

Poland

EU on target for 20% by 2020
But with the usual NW corner laggards a bit behind: https://uk.reuters.com/article/us-eu-renewables/eu-one-third-states-already-met-2020-renewable-energy-target-eurostat-idUKKCN1Q212W

Next: EC launches new €8.5bn fund to develop clean energy techs
www.energyvoice.com/otherenergy/193573/eu-commission-launches-8-5bn-fund-for-clean-energy-tech/


EFW defended www.ewaste-management-world.com/a/comment-european-suppliers-of-waste-to-energy-technology-secretary-general

Forest biomass hit again www.climatechangenews.com/2019/03/04/burning-wood-power-breaches-eu-treaty-new-lawsuit-claims/

GROWTH PROJECTIONS

EU POLICY ISSUES

EU POLICY ISSUES

UK not out of the EU yet! And maybe not out of it at all...

IRELAND
2030 renewable power target raised from 55% to 70%: www.eu.scienceswire.ie/2019/03/25/ireland-381-energy-uncertainty-2030/

POLAND
Its new energy policy is debated www.climatechangenews.com/2019/02/08/france-vows-renewable-energy-target-2050-and-may-revive-offshore-wind-idUKKCN1Q40LE

SOLAR PV LIVE ON LINE OUTPUT DATA

GERMAN POWER MIX CHANGES FROM COAL, NUCLEAR EXITS

EU FUEL/Energy SOURCES: 2017

EU FUEL/Energy SOURCES: 2017

SUNNYipla on EU flexible grid balancing: www.sciencedirect.com/science/article/pii/S0960148119302319

LUT on EU flexible grid balancing: www.sciencedirect.com/science/article/pii/S0960148119302319

https://eu.boell.org/en/energy
China still booms

China’s renewable power capacity rose 12% in 2018, despite transmission capacity concerns and a growing subsidy payment backlog. Total capacity, including hydro & biomass as well as solar & wind, was 728 GW by end-2018, according to the National Energy Administration (NEA). That’s 38.3% of China’s total installed power capacity. There was 20.59 GW of new wind, 44.3 GW of new solar PV, down compared to 2017 after a decision to slash subsidies. It also added 8.5 GW of hydro, mostly in the SW, bringing total hydro to 352 GW by end 2018. Reuters said ‘China has tried to change the “rhythm” of renewable power construction to give grid operators time to raise transmission capacity & ensure clean electricity generation is not wasted’. But, it noted that while overall rates of wind wastage had fallen to 7% last year, down 5 percentage points on the year, the major wind generation regions of Xinjiang & Gansu in the far NW was still unable to get about 20% of potential wind power onto the grid. 

https://uk.reuters.com/article/us-china-renewables/chinas-2018-renewable-power-capacity-up-12-percent-on-year-idUKKCN1PM0HM

It’s obviously still having problems, with PV in the NW also, cut back more:


Though it may soften the PV cuts:  www.forbes.com/sites/johnparnell/2019/02/26/china-gets-cold-feet-on-solar-subsidy-cuts

But emissions creep up:  http://www.carbonbrief.org/daily-brief/chinas-co2-emissions-surge-in-2018-despite-clean-energy-gains while its coal reserves fall. They were quoted by BP as 244 000 Mt. in 2017, but it now says 139 000 Mt.

USA moving ahead - but some greens fall out

Energy Information Administration 2019 outlook - growth green power

Job losses

20,000 solar jobs have gone due to Trump’s tariff shift:

Tech gains

Offshore wind is finally taking off in the US. According to the US Dept. of Energy, the US has a project pipeline of more than 25 GW of capacity, to follow the 30 MW already installed. Developers say about 2 GW may be running by 2023. Almost all of this is set to be on the East coats, led by 11 bid from Massachusetts:

Green splits over Green New Deal plans

In Dec., 626 local & national US green organizations, including 350.org and Greenpeace USA, sent a letter to Congress urging lawmakers to consider a number of principles when crafting the Green New Deal ‘to keep global warming below 1.5 degrees C’. Amongst other things, it called for a halt all fossil fuel leasing, a phase out all fossil fuel extraction, and to end fossil fuel & other dirty energy subsidies and a transition of power generation to 100% renewables. But eight major environmental groups, including the Sierra Club, the Natural Resources Defense Council, and the Environmental Defense Fund, declined to sign the letter. It seems they took exception to some of the details. For example, it states, ‘in addition to excluding fossil fuels, any definition of renewable energy must also exclude all combustion-based power generation, nuclear, biomass energy, large scale hydro and waste-to-energy technologies. To achieve this, the United States must shift to 100 percent renewable power generation by 2035 or earlier.’ Quite a radical list. It also said ‘We will vigorously oppose any legislation that… promotes corporate schemes that place profits over community burdens and benefits, including market-based mechanisms and technology options such as carbon and emissions trading and offsets, carbon capture and storage, nuclear power, waste-to-energy and biomass energy’. So no market-based carbon tax, or cap and trade system-instead direct government regulation. A hard leftist view! But Grist ran an article saying ‘to meet climate targets, we need every tool in the chest’, including nuclear & a carbon tax- which would support it. At least so far as nuclear is low carbon:

https://grist.org/article/a-green-new-deal-must-not-sabotage-climate-goals/

Comment ‘100% renewable by 2035’ is pretty extreme, especially with no hydro or biomass. A maximalist programme like that may be just ignored. In any case, some hydro is useful, for balancing variable renewables. Some AD of biomass is useful too- wastes especially. Better than it rotting to air. But nuclear is dying off!
Green energy jobs in Africa  Not enough trained people

Only 16,000 people are recorded as working in renewable energy in sub-Saharan Africa, outside South Africa, according to IRENA. That’s just 0.1% of the global renewable energy workforce, fewer than the number of people who work on wind power in the U.S. state of Illinois, IRENA noted. Reuters says one problem in Africa is that there are ‘too few trained workers able to plan, install and maintain solar, wind and other clean energy systems’. But it reports that a **Powering Jobs** campaign has been set up ‘to train up to a million people globally by 2025 to meet demand for renewable energy workers’, led by Power for All, backed by the Schneider Electric Foundation & The Rockefeller Foundation.

The Reuters article notes that, in Africa, ‘lessons are being drawn from India, which has trained more than 30,000 solar electric installers in the past two years as part of a government-backed effort. It aims to train a total of 50,000 installers by 2022’. But it adds ‘One of the biggest problems facing expansion of renewable off-grid power in Africa is that systems need to be built and operated in remote locations, where it can be harder to attract and retain staff’. It also notes that, in Kenya, the difficulty is cost: ‘skilled talent comes at high salaries, thanks to competition for the best people in Nairobi among companies and non-profit groups’.

It goes on ‘To provide a broader pool of potential hires, BBOXX has created the BBOXX Academy, an online learning platform that offers professional courses’, with university graduates put through a rigorous, development and exposure programme: https://uk.reuters.com/article/aficarenewables-training/feature-renewable-power-surge-in-africa-faces-a-shortage-not-enough-workers-idUKL8N1ZP2K0? For more see the Thomson Reuters Foundation, the charitable arm of Reuters: http://news.trust.org/climate Also see this interesting study on heating in South Africa https://ei.haas.berkeley.edu/research/papers/WP299.pdf which now has a Climate Tax: www.climatechange4news.com/2019/02/20/south-africa-set-introduce-long-awaited-carbon-tax-june/

**Indonesia** Palm Oil self-sufficiency plan- the best option? https://uk.reuters.com/article/uk-indonesia-election-palmoil/indonesian-presidential-hopefuls-vow-energy-self-sufficiency-via-palm-idUKCN1Q60MD

**India** $6.5bn for PV www.pv-magazine.com/2019/02/20/indian-government-approves-6-48bn-for-rooftop-and-farmland-solar/


**UEA** Storage for PV www.renewableenergyworld.com/articles/2019/03/storage-system-built-at-worlds-biggest-solar-park.html

**Mixed Climate/Tech views**


Maybe GWPF is tired of saying we don’t need it! Though some say it will hurt the poor: https://patriotpost.us/opinion/60789-does-fighting-global-warming-help-or-hurt-the-poor/ But some say we may not need to worry so much about population rise- it may fall, with urbanization leading to smaller families: https://populationmatters.org/news/2019/02/05/will-world-run-out-people China through did already try to cut family size, with, arguably, dire results. But it is trying to cut CO2: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785559/Mock_Final_1.pdf


But some say carbon markets can work, if the carbon price is high enough- even the EU ETS is getting going: www.forbes.com/sites/mikescott/2018/09/03/europes-carbon-market-starts-doing-its-job-of-cutting-emissions-a-decade-late/815cf1e62171


100% renewables by 2050 globally? Here’s how!

Each country/regions will have to play to its strengths, say a group of LUT linked researchers. Their map below shows which technologies fit best for each global region in broad terms.

They say that ‘a global transition needs effort and investment, but each step can realistically lead to gradual, evolutionary change. A sustainable and carbon neutral electricity system based on 100% RE is technically feasible and economically viable globally by 2050 due to the reasonable total system LCOE (26–72 €/MWh) with a global average of 52 €/MWh (uncertainty range 45–58 €/MWh).’ With storage costs falling.

The second map shows the rough global distribution of low cost sources. Africa does well!

Global Technology policy news - divergent views

Grid defection threat! It can be overstated: most users will still import: www.energylivenews.com/2019/02/05/risk-of-electricity-users-going-off-grid-expected-to-rise

P2G ready Some say Power to Gas hydrogen production, using excess green power, is competitive in niche markets & will be so across the board in 10 years: https://energypost.eu/renewable-hydrogen-already-cost-competitive-says-new-research/ And some don’t want to use just surpluses: www.euractiv.com/section/energy/interview/researcher-100-renewable-energy-requires-a-lot-of-green-hydrogen/

Trade offs on biomass ‘Although plantations of exotic trees might be bad for biodiversity, they are better for the climate than is clearing land to accommodate herds of methane-belching cattle.’

And on hydro dam projects - they can compensate for the large methane emissions from wetlands: www.academia.edu/38392970/Hydropower_dams_can_help_mitigate_the_global_warming_impact_of_wetlands_vWEB.pdf

Biomass or Direct Air Carbon Capture & Storage/Use - debate rumbles on

BECCS needs lots of land for biomass growing. DACCS needs less land but cost more, uses energy to run, and doesn’t generate power. Both need CCS. DACCU with P2G can generate valuable synfuels, but CO2 is produced when they are burnt: https://pubs.rsc.org/en/Content/ArticleLanding/2019/EE/C8EE03682A#divAbstract

DACCU push: Air capture has been seen as costly: www.pnas.org/content/108/51/20428

But some say not: www.cell.com/poule/pdf/82542-4351(18)30225-3.pdf And how about this: ‘Carbon-capture-derived fuels, if they become cheap enough, could be a form of energy storage-made in summer, with solar or wind power, & used in winter - that carries a lower cost (and longer life) than batteries’, www.nytimes.com/2019/02/12/magazine/climeworks-business-climate-change.html

Go & stop in Asia South Korea is to phase out nuclear gradually

However, its Nuclear Safety and Security Commission has given Korea Hydro and Nuclear Power permission to begin operation of unit 4 at the Shin Kori nuclear power plant, the second unit to be allowed to start up. Further new plants are planned, an odd sort of phase out:

www.world-nuclear-news.org/Articles/Second-Korean-APR1400-unit-cleared-for-start-up

Meanwhile, despite the public referendum vote against Taiwan’s plan to phase out nuclear, the government has evidently decided to continue with the plan. DPP, Taiwan’s Democratic Progressive Party, was elected in 2016 with a policy of creating a ‘nuclear-free homeland’ by 2025: its six reactors would be decommissioned when their 40-year operating licences ended. After taking office, the DPP government passed an amendment to the Electricity Act, putting the phase-out policy into law. But in a referendum last Nov., voters opposed the amendment and it was duly removed from the Act in Dec., though, in Jan. Minister of Economic Affairs Shen Jong-chin still insisted that ‘there would be no extension or restarts of nuclear power plants in Taiwan due to subjective & objective conditions, as well as strong public objection’:

www.world-nuclear-news.org/Articles/Taiwan-government-maintains-nuclear-phase-out

Spain aims to close all 7 of its nuclear plants ‘between 2025 and 2035’

But, the draft plan last Nov. said that all should be closed after 40 years of service, so since the last one started up in 1988, going to 2035 is actually a life-extension. Phasing out nuclear, which supplies just over 20% of Spain’s power, was a campaign pledge for the governing Socialists, who took office last year toppling their conservative predecessors in a confidence vote. Renewables will be pushed hard - see above:


‘Low cost’ Nuclear The OECD Nuclear Energy Agency see nuclear as low cost!

At least in total system cost terms, avoiding the high supply ‘profile costs’ of coping with variable renewable energy (VRE). Even so, it says ‘a cost-effective low carbon system would probably consist of a sizeable share of VRE, an at least equally sizeable share of dispatchable zero carbon technologies such as nuclear energy & hydroelectricity and a residual amount of gas-fired capacity to provide some added flexibility alongside storage, demand side management & the expansion of interconnections’. It adds ‘Those of us working in the nuclear energy area are well aware of the electricity markets are evolving and that nuclear energy must evolve to meet future requirements. Nuclear energy is well placed to take on these challenges but can also work together with all other forms of low carbon generation, in particular VRE, to achieve the ambitious decarbonisation targets NEA member countries have set for themselves.’

But it undermines its case by apparently accepting that nuclear isn’t suited to dealing with high VRE:

www.oecd-nea.org/udd/pubs/2019/7299-system-costs.pdf  But see Box below: allegedly, it can be sometimes.

Some-times Flexible Pressurised Water Reactors ‘Since the1980s EdF has used in each PWR reactor some less absorptive ‘grey’ control rods which… allow sustained variation in power output. This means that RTE can depend on flexible load following from the nuclear fleet to contribute to regulation in these three respects: Primary power regulation for system stability (when frequency varies, power must be automatically adjusted by the turbine). Secondary power regulation related to trading contracts. Adjusting power in response to demand (decrease from 100% during the day, down to 50% or less during the night, & respond to changes in renewable inputs to the grid, etc.) PWRs are very flexible at the beginning of their cycle, with fresh fuel and high reserve reactivity. An EdF reactor can reduce its power from 100% to 30% in 30 minutes. But when the fuel cycle is around 65% these reactors are less flexible, and they take a rapidly diminishing part in the third, load-following, aspect above. When they are 90% through the cycle, they only take part in frequency regulation, and essentially no power variation is allowed (unless necessary for safety). So at the very end of the cycle, they are at run steady power output and do not regulate or load-follow until the next refueling outage.’


But US Breakthrough sought www.world-nuclear-news.org/Articles/Clean-energy-ecosystem-proposed-for-USA

And this: http://knowledge.wharton.upenn.edu/article/can-nuclear-energy-save-the-planet/

Like Sweden? www.nytimes.com/2019/02/05/books/review/bright-future-joshua-s-goldstein-staffan-a-qvist.html

But not India Fuel is scarce www.world-nuclear-news.org/Articles/Indian-government-takes-steps-to-get-nuclear-back

Turkey still plans to go nuclear, with Russian help, but that policy has not been without opposition:

www.academia.edu/38349967/Framing_Opposition_to_Nuclear_Power_The_Case_of_Akkyuyu_in_Southeast_Turkey

and www.world-nuclear-news.org/Articles/Basemat-of-Turkeys-Akkyuyu-1-completed The EU reportedly calls for halt...

Small ModularReactors A critique: https://wiseinternational.org/sites/default/files/NM872-873-final.pdf
3. Forum  Odds and ends to chew on - comments welcome

Cities and Sustainable energy

Decentralisation clearly is valuable and much can be done on that basis, but the switch to renewables cannot escape the need for some larger scale grid-linked systems. That’s nowhere clearer than in cities. PV solar can help, but given the high population densities, few cities can supply all their energy needs from renewable resources within their boundaries. Most will have to import some green power from outside, possibly from sources a way off. There are of course some possible wider (and wilder) extremes. For example, on one hand, there are those who look to a fully decentralised, simpler, low-growth, more frugal, mainly rural future, even possibly to the complete demise of cities as ecologically unviable, with all energy being locally derived. See http://thesimplerway.info/ On the other hand, less palatably, some self-styled ‘Eco-modernists’ look to vast hyper-centralised high-tech cities, powered mostly by nuclear fission, or more likely fusion, with GM food grown hydroponically and the natural world (outside the city) left to revert to the wild: www.ecomodernism.org/

In a chapter in a forthcoming book on Sustainable Cities edited by Stanislav Shmelev, Dave Elliott has mapped out the implications of adopting a Middle route, although one that is nearer to the first than the second extreme. That will involve some potentially tricky relationships with rural areas - who may not welcome having to host large wind and solar farms and biomass plantation to service cities.

Forbes get stuck in  It’s noticeable that, in the financial news sector, Forbes is covering renewables more now, maybe stung by Bloomberg’s pre-eminence in this area. This isn’t too bad an intro: www.forbes.com/sites/bradtempleton/2019/03/11/what-happens-when-we-put-renewables-on-the-grid-to-green-our-electric-cars-is-really-complicated/


Credit where its due  Dr John Constable, from the Global Warming Policy Foundation, says that the Euro Commission’s recent study of the effect of climate and other policies on global competitiveness contained a major error. It claimed that annual levies on UK consumers in 2016 for renewable electricity subsidies were €1.57 bn, whereas he said they were close to €7 bn. The EU concurred. Constable noted that EU domestic power prices were already over twice those in the G20. https://mailchi.mp/ce5277b9ca1d/gwpf-finds-major-error-in-eu-commission-analysis-understating-uk-renewables-subsidy-costs-173761

Good to see Energy Matters still also as contrarian as ever (despite the sad loss of a key member), this time on nuclear: http://euanmearns.com/open-energy-4-renewable-energy-versus-nuclear-dispelling-the-myths/

But nothing on this side of it: www.theguardian.com/world/2019/mar/11/fukushima-toxic-soil-disaster-radioactive

Green New Deal

It got sat on, but may still stand a chance, revamped! www.vox.com/energy-and-environment/2018/12/21/18144138/green-new-deal

But a lot more detail is needed- its not enough just to call for ‘meeting 100% of the power demand in the US through clean, renewable, and zero-emission energy sources’. e.g. does that include nuclear?

GMOs challenging negativity  Renewables will boom, but not fast enough.

They can’t avert climate change. So says Jeremy Grantham in a grim GMO White paper - see News. www.gmo.com/europe/research-library/the-race-of-our-lives-reinvested/ BP say similar things, and the IEA wants efficiency maxed, and worries about how fast renewables can ramp up, and, like the IPCC, see CCS/ negative Carbon Techs as vital. So did the UK’s CCC and the EU - at least until recently. IRENA too, but it does say renewables, along with efficiency, can help us make 90% of the emission cuts needed to keep below 2°C by 2050; www.irena.org/publications/2017/Aug/Synergies-between-renewable-energy-and-energy-efficiency

And its new global assessment is even more positive, with renewables taking an 80%+ share by 2050: http://geopoliticsoffuturenergies.org/assets/geopolitics/Reports/wp-content/uploads/2019/01/Global_commission_renewable_energy_2019.pdf LUT/EWG and Jacobson also offer some inspiring maximal 100% by 2050 scenarios. No one says it will be easy, and we will need energy (and maybe NET carbon) saving, but let’s not get too gloomy.

Same goes for the World Economic Forum’s grim analysis too: we’ll look at that in the next Renew.
An energy park between the USA and Mexico

Instead of a wall, build a first-of-its-kind energy park that could pay for itself, spanning the 1,954 miles of the border between the US and Mexico to bring energy, water, jobs & border security to the region. An audacious plan by a consortium of 28 Perdue University-led US engineers & scientists.

Resource limits - our rare earths

Eco costs - US nuclear power fan Michael Shellenberger lists all sorts of horrors with wind and solar in his TEDx Danubia talk. It’s a partisan shake down, recycling a lot old of factoids. Wind turbines kill more than nuclear eh? We maybe need an errata sheet! But all the points he raises are dealt with in Dave Elliott’s forthcoming expanded edition of his IoP ‘Renewables’ book - and also elsewhere. www.youtube.com/watch?v=N-yALPePv4w


More on Mike Cooley’s new book on human centered technology

https://steps-centre.org/blog/answers-on-a-postcard-how-would-you-do-technology-differently/

Another playlist...

Climate action


New initiative: www.scientists4future.org/stellungnahme/ There are moves to set up an independent research hub.

P2G break through

Hydrogen produced using renewable electricity is ‘already cost competitive’

That’s in niche applications, but within a decade, the falling cost of renewables combined with the significant cost reduction potential of power-to-gas technology could lead to much cheaper electrolytic hydrogen production than many have previously thought, even beating fossil SMR without CCS: www.nature.com/articles/s41560-019-0326-1

And also a useful P2G guide from CAT: www.cat.org.uk/power-to-gas-energy-storage-solutions/

Supergridsvital Few countries can be self-sufficient ‘prosumers’, even with storage - they’ll also need interlinks: www.pv-magazine.com/2019/02/07/super-grids-vs-prosumer-states-storage-may-decide-the-battle/
Labour’s odd stance on nuclear power

Labour say it will provide **public funding** for new nuclear, as is reported in our News, in the *Sun* and also recycled in the *Mirror*: www.mirror.co.uk/news/politics/tory-energy-failures-raise-fears-14149517

How much of a public stake they would take in the proposed new nuclear plants is unclear and they have leveraged that by saying they would ‘**mobilise huge investments in renewable energy**’, including onshore wind and (more contentiously) the Swansea Tidal Lagoon. But they buttress all this by saying that otherwise ‘the lights will go out’. Odd. Electricity use has been falling steadily - back to 1994 levels: www.carbonbrief.org/analysis-uk-electricity-generation-2018-falls-to-lowest-since-1994

We do need new capacity to replace old nuclear and coal plants, and to supply some heating and for electric/hydrogen-powered vehicles, but there are many options available. Indeed, as Labour say, there are ‘nearly 800 shovel-ready onshore wind projects’ ready to go. There are also expansion options for offshore wind, with costs falling dramatically. In the second full CfD round in 2017, two offshore wind projects with 2022/23 start up dates were offered strike prices of £57.5/MWh, a 50% fall from the previous CfD round in 2015. Moreover, the costs of on shore wind are likely to be even lower than that. Similarly, for PV solar - two projects got CfD strike prices of £50/MWh in the 2015 competitive auction round - that of course being before the government blocked PV from further support. By contrast, the CfD index-linked strike price agreed for the Hinkley nuclear plant, without competitive auction, was £92.5/MWh, which, with inflation, would be more like £100/MWh, and rising, by the time it might be running, perhaps in 2027, if EDF can stay the course.

The government is looking to a new funding approach for the proposed follow up reactors, given that some of the key developers have backed off further investment. Evidently the CfD was not enough.

The aim seems to want to offer **taxpayer** support. Neither plan makes sense if we don’t need nuclear!

**The case against** In addition to the safety and security issues, nuclear plants would get in the way of the expanding renewables programme, since the proposed large plants are inflexible and can’t be used to balance the output from variable renewables like wind & solar. Instead we need to invest in flexible supply, demand side balancing systems, smart grids, & storage, including electrolytic ‘Power to Gas’ hydrogen production, using surplus renewables power, stored ready for conversion back to electricity when renewables inputs are low. So, we don’t need nuclear for power or for balancing.

Labour seems to fall back on the argument that it is needed for jobs, a view shared by some trade unions. And yet there will be many new jobs created by the renewables programme, as well as large scale employment in the nuclear decommissioning and clean-up programme, which will take decades to complete. But we do need to think about retraining & providing transitional aid as the new energy system takes over: www.energylivenews.com/2019/03/11/energy-workers-must-be-supported-through-renewable-transition/

Around the world most countries are beginning to make this transition, with only a hand-full retaining some nuclear in the mix. For example, in China renewables now supply around 7 times more power than nuclear, and nuclear is being phased out in much of the rest of Asia. The UK is one of the few countries still looking to significantly expand nuclear power. Does the UK want to copy Russia?

Chernobyl retrospectives

‘On the night of **April 25, 1986**,** during a planned maintenance shutdown at the Chernobyl power plant in northern Ukraine, one of the four reactors overheated and began to burn.**’ That’s how a review of the recent batch of books on Chernobyl in the *New York Review of Books* opens - and it proceeds in lurid style. The books are useful, offering detailed histories of the event and its aftermath. So it’s a pity this otherwise good review (see sample in Box) starts off with an obvious error - it was far from a ‘planned maintenance shut down’. It was a carefully designed **safety** experiment aiming to show that the reactor system could power itself when and if external power sources failed. To that end, all the key safety interlocks (which would have automatically shut the reactor down and started up separate self-powered cooling systems, when external power was cut) were shut off. The reactor output was wound down to minimum power and then the external power input switched off. To put it very simply, the experiment didn’t work - it rapidly overheated and exploded. The books tell the full, complex, horrifying story, with the emphasis in some on the tragic aftermath of deaths, illnesses, denial, deceit & official complacency. Sadly, the later seems still all too familiar: www.nybooks.com/articles/2019/04/04/chernobyl-syndrome/
