
Re: u3a Second Nature September 2023

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Bulletin 004 - Wind

*Westron wynde, when wyll thow blow
The smalle rayne downe can rayne?
Cryst yf my love were in my armys,
And I yn my bed agayne!*
- Anon

Wind farms will devastate the countryside pointlessly.
- [James Lovelock](#)

Westron Wynde is old, possibly as early as the 14th century. I used to have a lovely rendition by Maddy Prior in my vinyl collection, but it went to Oxfam a long time ago.

It's been an interesting month for the **wind** industry. so I'm devoting most of this bulletin to wind (no change there, I hear you say). This will be a bit geeky but please bear with me.

Early in September the Communities Secretary Michael Gove **changed the planning rules for onshore wind in England** so that developments can no longer be stopped by a single objector. He said *to increase our energy security and develop a cleaner, greener economy, we are introducing new measures to allow local communities to back onshore wind power projects. This will only apply in areas where developments have community support, but these changes will help build on Britain's enormous success as a global leader in offshore wind, helping us on our journey to net zero.* Whether this statement is just wind remains to be seen - onshore wind developments still face different planning requirements from other

infrastructure projects; so just one cheer for Mr Gove on this, and I'll hold back the other two until we know how things pan out.

[\[More\]](#)

I have met people who object vehemently to wind turbines in the landscape; there is no effective counter to this objection, but I was heartened to read this from the Architecture Critic, Rowan Moore:

Growing up in the countryside, it was a feature of drives with my parents that electricity pylons would be deplored. So I am familiar with the instinct for country dwellers to oppose wind turbines, which like pylons are large, energy-providing infrastructure. [This led] David Cameron to tighten up rules in 2015 in a way that led to a 97% reduction in the numbers granted planning permission.

Although the government has announced an easing of these rules they still give plenty of power to objectors. But I would ask country dwellers still inclined to block [turbines] to see that they are in fact beautiful. They are prettier than power stations, less destructive than fracking, certainly lovelier than floods, fires, droughts and other effects of climate change. They enrich the nation with the help of its abundant wind, and make us less dependent on fossil-fuel despots. Wind turbines are in a long rural tradition of robust practical structures that includes barns, mills, viaducts, canals and others that have become beloved and protected. On those same drives I was always happy to see an old windmill. It shouldn't be too hard to love their modern equivalents.

Good stuff. My Dad used to hate TV aerials, but maybe that was because we couldn't afford a TV. On the plus side, I learned to read at an early age.

Our success as a global leader in offshore wind took a knock a few days after Mr Gove's announcement, when the latest Allocation Round resulted in **no bids for offshore wind**. In the previous round, AR4, which reported in July 2022 BEIS agreed Contracts for Difference (CfDs) for 10.8 GW of renewable electricity generation capacity to come on stream between 2023 and 2027. 6.994 GW of this capacity was for offshore wind and 0.888 GW for onshore. All the onshore projects were in Scotland.

UK peak demand in 2022 was 47.2 GW, so 10.8 GW is 23% of peak demand. We won't get 10.8 GW all the time obviously, we'll get some of it some of the time.

CfDs

In a CfD a buyer and a seller agree on a clearing price and the buyer pays the seller the difference between the current wholesale price and that price. The buyer here is the Low Carbon Contract Company, which is wholly owned by UK Government. The

generators get the wholesale price and if it is below the clearing price then they get a top-up from LCCC, and if it is above the clearing price then they pay back.

There were already signs that the AR4 prices were too low. Vattenfall's Norfolk Boreas windfarm was planned to have three phases of 416 MW, 505 MW, and 475 MW respectively. The clearing price was £45.37. In July Vattenfall decided not to complete the windfarm at this price, saying that it was not longer profitable because of rising interest rates and the impact of inflation on its supply chain.

[\[More\]](#)

The clearing price in the latest auction was pegged at £44.

If you are an energy geek it is informative I think to look at LCCC's [register of CfDs](#). Here is a summary:

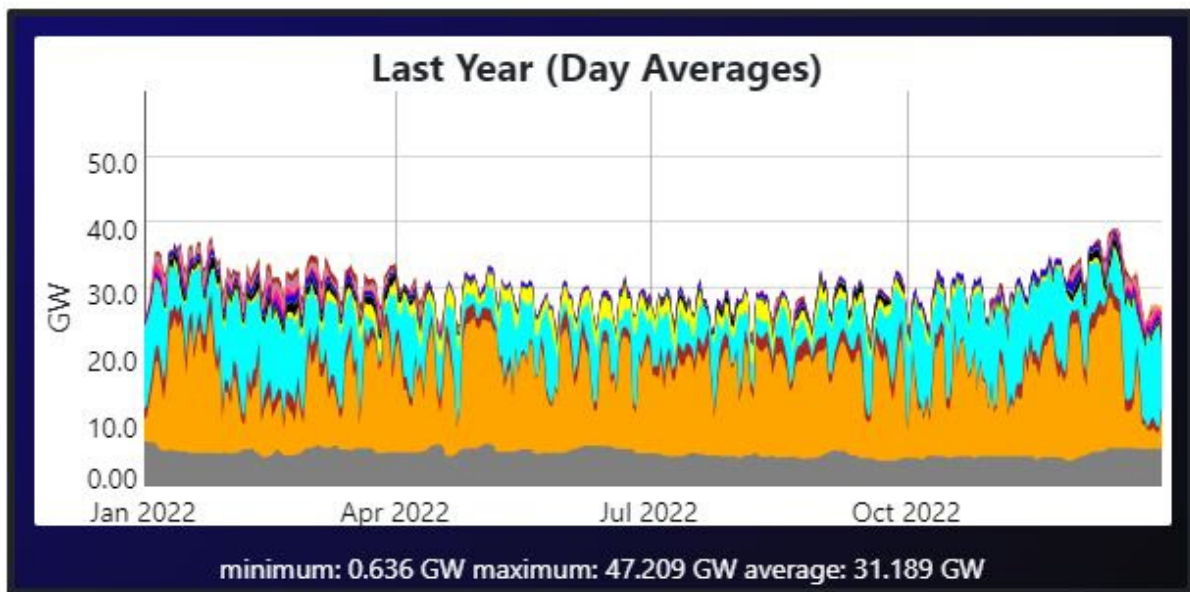
CfDs by type of generation Source: LCCC

	No. CfDs	Highest Price	Lowest Price	Biggest (MW)	Smallest (MW)	Total (MW)
Offshore Wind	51	£209.32	£45.37	2,852.00	12.00	20,002.34
Nuclear	1	£128.09	£128.09	3,277.20	3,277.20	3,277.20
Solar PV	69	£105.98	£56.99	112.00	6.00	2,248.08
Onshore Wind	25	£110.35	£52.25	212.00	6.15	1,636.51
Biomass Conversion	2	£139.08	£132.47	645.00	420.00	1,065.00
Remote Island Wind	10	£62.05	£49.77	220.00	16.32	872.82
Dedicated Biomass with CHP	3	£165.97	£82.58	299.00	0.64	384.64
Advanced Conversion Technology	10	£160.36	£45.40	27.50	0.05	151.91
EfW with CHP	3	£107.01	£45.99	49.75	30.00	124.75
Tidal Stream	4	£238.81	£235.24	28.00	2.40	40.82
Floating Offshore Wind	1	£116.77	£116.77	32.00	32.00	32.00
	179					29,836.07

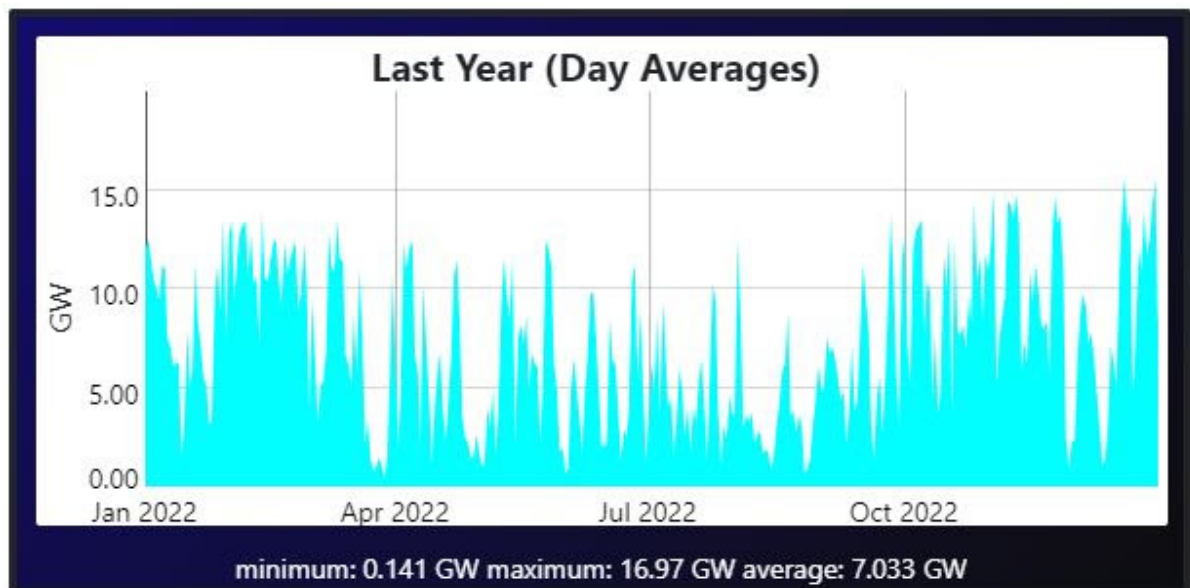
'Price' here is the current clearing price; EfW is Energy from Waste and CHP is Combined Heat and Power. You can see that new wind may be cheap now but old wind is a lot less so. (The wholesale spot price is currently hovering around £100). There is 29 GW of capacity here, but much of it not yet on stream: about 9.4 GW of this capacity has a commissioning date of 1/9/2023 or earlier.

Wind in 2022

How much power did we get from wind in 2022? This was the UK's demand for electricity:



From bottom to top this is nuclear (grey), gas (caramel), and wind (blue). Solar is in yellow. This is the contribution from wind:



(You will notice that the max and min here don't seem to match the graph: this is because the graph shows day averages, where the max and min are instantaneous values).

These must be worrying numbers for anyone planning a power network: the min value for wind is 1/50th of the average, and 1/120th of the max value. There are two reasons for this variability:

1. wind speed. The power available to a wind turbine goes as the cube of the wind speed, so if the wind falls off the power delivered falls off rapidly
2. shutdown. If the windspeed is very low the windfarm operator may shut it down because the power output isn't worth the wear and tear on the machinery.

In other words, weather is the problem. In my view the real value of wind is in avoided CO2 emissions: without it, all that 'blue' electricity would have to be produced using gas or even coal. We should think of renewables not in terms of the cost of a MWh of electricity but more in terms of what it costs to prevent the emission of one tonne of CO2. Our energy strategy might be different if we did that.

For more detail of how much wind power we got in 2022, go to the Digest of UK Energy Statistics ([DUKES](#)) provided by [DESNZ](#). DUKES says that we had 14,835 MW of capacity onshore in 2022 and 13,927 MW offshore, a total of 28,762 MW. Capacity in DUKES is de-rated for hydro, wind and solar PV to account for intermittency, by factors of 36.5%, 43% and 17% respectively. Using the average of 7,033 MW from in the chart above however suggests that wind capacity should be de-rated by 24%. I can't explain this discrepancy.

Is wind still cheap when the cost of backup gas is taken into account? I'm not enough of an economist to answer that question. What has been clearly demonstrated over the last few years is that the wholesale cost of electricity closely tracks the gas price. I've commented on this in a [FAQ](#) on the website so I won't go into it here.

Last year the government announced a Review of Electricity Market Arrangements ([REMA](#)). One idea discussed in REMA is a split of the electricity market into an 'on-demand' market (for gas and coal) and an 'as-available' market for renewables. Storage I guess would play in both markets; where nuclear would go I'm not sure. The price in the on-demand market would be set largely by the cost of fuel, and in the as-available market largely by the capital cost of plant. This would mean that cheap renewables would have greater influence on the wholesale price. A bit more on this in [FAQ](#).

In other news ...

Enrich the Earth launched this month. It is a coalition which includes the National Trust, Royal Horticultural Society, Suez and the Horticultural Trade Association, and it is calling for a radical rethink of how we deal with organic waste. For more, click the image below.



CULTIVATING THE COMPOST REVOLUTION



In other food waste news:

- the Community Fridge Network has received £3m in funding from the Co-op to support reducing food waste by allowing communities to share surplus food. Three cheers for the Co-op. [\[More\]](#)
- Researchers at The University of the Bleedin' Obvious report that people waste less food if they grow it themselves. [\[More\]](#).

Guidance to be issued by the Charity Commission this week will make it clear that charities are entitled to campaign robustly online in support of their mission and beneficiaries. To do so they must have the backing of their trustee boards, keep within the law, and act with “respect and tolerance.” Climate group leaders please note. One can only hope that u3a's officers (and its lawyers) are all over this. [\[More\]](#)

Carbon Capture and Storage: the government awarded licences to companies that plan to store CO₂ trapped from heavy industry in depleted oil and gas fields. They include Shell, Italy's state-owned oil company ENI, and Harbour Energy, the largest independent oil and gas company operating in the UK's North Sea basin. The industry's regulator, the North Sea Transition Authority, says that this could help store up to 30m tonnes of CO₂ a year by 2030, approximately 10% of UK annual emissions. I'd give a cautious one cheer to this one also: CCS may have an important role to play, but it mustn't be used by government and industry and a substitute for reducing emissions. Reducing emissions is the priority. [\[More\]](#)

Plastics Treaty: the UN Environment Programme has released the first draft of a legally binding Global Plastics Treaty which aims to eliminate plastic pollution

worldwide by 2040. The draft does not include specific targets, but it's a start. One cheer. [\[More\]](#)

Feedback

GS from Guisborough drew my attention to this, from the article by Kimberley Miner that I linked in the last bulletin:

*I spoke to one of the scientists who led the work for which the Intergovernmental Panel on Climate Change was awarded a Nobel Prize in 2007, about how we can address climate grief. **After decades of working to convince the public that climate change is real, he said that we need to work on solutions. He thinks that the current generation of climate scientists needs to move on from education and advocacy to providing solutions for mitigation, adaptation and resilience.** The best treatment for climate grief, he says, is knowing you've made a contribution to reducing emissions or building resilience. [Emphasis added by GS]. Unfortunately Miner's article has now disappeared behind Nature's paywall.*

TM from Bristol emailed to say *thank you for your newsletters - I am finding them thought provoking and also quite entertaining in their way.* I'm still pondering about that 'in their way'.

LA from Ilkley said *I would ... suggest that in spending time looking at the material you suggest in your email, we are being deflected from focusing on actions for change that might have a chance of the planet staying below 1.5 C.* (All I can say is, don't be; I'm just an adviser, you're the activist). She strongly recommends the book [Five Times Faster](#) by Simon Sharpe and this [youTube](#) video about it.

If you have content that you would like to see in this newsletter send it to me. I reserve the right to make arbitrary but I hope fair decisions as to what is included, and to edit things in the interest of brevity.

Slogan of the Month

You wait all month for an inspirational message, then three come along at once:



The pledge was produced in the US during World War II. I admire the simplicity of the language here - "I will buy carefully". We could do worse than adopt these principles now.

References and Acknowledgements

The charts showing UK electricity demand and supply are from [Gridwatch UK](#), essential data for anybody who wants to understand the UK electricity industry. The demand figure is from [Elexon](#). Numbers by fuel type output are from Elexon, except for solar which is an estimate supplied by Sheffield University.

The text from Rowan Moore comes from [his Observer column on 9th September](#). I've edited it a bit.

I first came across the Consumer's Victory Pledge in a Vox Populi post by George Monbiot. I've tried to find it, but Google proved not up to the task.

For a definitive analysis of the physics of wind power see David MacKay's *Without the Hot Air*: https://www.withouthotair.com/c4/page_32.shtml and https://www.withouthotair.com/cB/page_263.shtml.

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(ends)



See also the [u3a Climate Change & Environment website](#).

A note on sources: I am a Guardianista (and indeed a Guardian Supporter) and I frequently forward links to content from that paper. This is for practical reasons, not political ones - unlike your favourite newspaper Guardian content is not behind a paywall (you may have to register, but you won't have to pay). I will from time to time link to content from The BBC, [The Conversation](#), [Ensia](#), Nature, and other sites that I feel are credible.

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