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The global energy drought may herald a future of excess

By DAVID FICKLING

OUR energy system is built upon a mountain of waste.

Believe it or not, that's a good thing. Look at the journey that power takes to your plug socket from its original source, and you'll find excess and overcapacity every step of the way.

All electricity grids are designed with a reserve margin – some 10% or so in excess of expected peak demand, that can be called on in exceptional circumstances to prevent blackouts.

Before that, the coal and gas-fired generators are also oversized, functioning barely half the time at present and only 70% or 80% of capacity when they weren't competing so hard with renewables.

The fuel that powers them also derives from operations that run with a lot of slack, with US oilfields traditionally running at between 90% and 95% of capacity and coal mines at 81% or so.

All that oversupply provides a useful function.

When power demand runs

ahead of forecasts, the surfeit of capacity can be readily called upon to provide additional electricity at short notice.

That's precisely what we're seeing right now: The surging costs of Chinese coal, European gas and global crude are the symptoms of an energy system using high prices to incentivise additional supply when and where it's most needed.

For all that zero-carbon power is likely to win the long-term race to meet the world's energy needs, this gives fuel-based energy a substantial advantage.

A new wind or solar farm (let alone nuclear plant) simply can't be built in a time frame comparable to what you need to produce an extra gigawatt-hour from hydrocarbon fuel – not to mention the matter of days it takes to ship that fuel from an oversupplied storage tank in Europe to an undersupplied one in Asia, or vice versa.

The current problems facing the world energy system are, as the International Energy Agency said

this week, fundamentally about the widespread dislocations you'd expect as we awaken from a once-in-a-century pandemic.

As such, they won't hold back the switch to zero-carbon power.

Timely reminder

Still, they're a timely reminder that an energy system based upon a fungible, global fuel trade is a huge asset in trying to balance out fluctuations in demand between regions and seasons. That's a characteristic that future grids will need to reproduce to reach net zero.

There are several possible ways of addressing this, and none are ideal.

One option is to make use of national and international electricity transmission lines to shift power from one region to another.

That's the promise of proposals to link India's grid with ones in the Middle East and South-East Asia, or to power Singapore with renewable electricity from the Australian outback.

Running such links over large distances through deep oceans pushes the limits of our engineering abilities, however.

On top of that, you face challenging geopolitics wherever, say, an Indian power line needs to pass through Pakistani territory.

Alternatively, if carbon capture and storage can be made to work, you might continue to use existing fuels and remove the greenhouse gases from smokestack emissions – but that, like green hydrogen, is a costly and untested technology, and more low-carbon than zero-carbon.

Such systems will almost certainly be needed as a backup.

Most important element

The most important element, though, may be to recreate the inefficiencies of the current fossil-fuel energy system in the new zero-carbon one.

Among renewable developers, "curtailment" – the situation where so much energy is being produced from wind or solar that the grid

can't accommodate it, and the electricity is wasted – has traditionally been a dirty word.

Still, some energy modelers have started arguing that massive overbuilding of wind and solar power – constructing so many plants that even a collapse in supply or surge in demand isn't sufficient to tighten the market too much – may prove the cheapest way to build a zero-carbon grid.

If so, the future that we're looking at isn't the one of constrained energy supplies that the current record prices for coal and gas is suggesting, but instead one where power is so abundant that we barely know what to do with it.

If you want to recreate the virtues of our current inefficient power system, building in a little deliberate inefficiency into our future may be the best way to do it. — Bloomberg

David Fickling is a Bloomberg Opinion columnist covering commodities, as well as industrial and consumer companies. The views expressed here are the writer's own.