

Keeping the lights on

The government's ambitious plans to move to net zero require the widespread adoption of electric cars, electric heating and much else that will need more power to be generated. It will also of course require most if not all of this electricity to be generated from renewables. The current starting position includes around one fifth of our power coming from nuclear power stations. Most of these are scheduled to close for old age this decade. We also often import around 5% of our power from the continent at some cost to ourselves and the balance of payments. We need to regard this as an unreliable source given the problems with continental capacity and their present reliance on Russian gas and some coal. A substantial but variable portion of our present electricity comes from gas fired stations, depending on how strongly the wind is blowing and how many sunshine hours there are for the renewables.

Germany is becoming more dependent on renewables and has had some outage problems on cold calm days with little sunshine. California has power cuts from her dependence on renewables, despite having a usually favourable climate for wind and sun. As the UK plans its way to net zero it needs to promote getting sufficient electricity capacity higher up the list of priorities.

The UK used to seek guaranteed supply and relatively low cost from its electricity policy. Privatisation in the 1980s drove down costs by replacing old and inefficient coal stations with much more fuel efficient modern gas combined cycle stations. The merit order meant the cheapest power was delivered on base load, only to be topped up by the more marginal dearer power. Environmental requirements were added as a third aim of policy. Privatisation did reduce CO2 output substantially by closing so many coal stations from market forces. Prices of power fell.

As policy has come to be dominated more and more by greenhouse gas considerations, the price of power has gone up and the margin of spare capacity has fallen. Indeed, capacity has become a difficult thing to estimate or measure. The more renewable power on the system the more variable the capacity is, varying from minute to minute depending on weather conditions. The system managers have a more difficult task than before. They are turning to interruptible contracts, to get industry to switch off if the wind stops blowing. They are calling for battery parks to offer stand by capacity, seeking people with stand by diesel generators for difficult times and wanting to flex tariffs to encourage off peak use. All of these methods can help, but they cannot be substituted for having enough capacity with a decent margin to allow for variability of supply from renewables.

There are some approved renewables or green methods of generating power that are always available or available to a predictable pattern. Biomass or wood burning is as good as coal or gas as reliable power, there when you need it. Certain designs of water power are there on stand by or available for regular times depending on tides, pump systems, and reservoir controls.

Reviving water wheels from the past alongside windmills would have given more reliability. The UK has only one main pump storage system. It could do with some more to give the flexibility the system managers will need.

The scale of the task is immense. If the government is serious about ending new diesel and petrol cars from 2030, and serious about the widespread adoption of electric heating, the demand will greatly magnified from today. Yet today we are close to power cuts every time we have a cold day with little wind or sun. I will ask our latest Business Secretary to do something about our future capacity, as I have asked his predecessors.