

Which technologies could replace our fossil fuel driven economy?

With most people relying on fossil fuel for vans and cars, deliveries, holiday travel and heating and with most industry using gas coal and oil for its factories and processes, shifting from fossil fuels requires an enormous investment and change.

Net zero enthusiasts regularly tell us a huge increase in wind farms, onshore and offshore, would enable a faster UK transition. Yesterday I asked them to guide us on how quickly the grid and street cable systems can be greatly expanded and how this will be paid for. We await cogent answers. Without more grid and cable the wind farms cannot send their power to customers.

Today I want to ask what do we do on days and at times when the wind does not blow or blows too much? There are various technical answers being explored. There could be more large battery farms, where the batteries are charged on good wind days and discharged to the grid on low wind days. There is considerable power loss on charging and discharging, and issues over effective battery lives.

There is the possibility of using surplus wind power on good wind days to make green hydrogen. Direct drive hydrogen engines are arguably more effective for heavy plant, trucks and buses, than trying to make powerful enough batteries. Hydrogen home heating may prove warmer and better than heat pumps. A hydrogen system would require large plants to make and store commercial quantities of the gas and a distribution system for it.

There is the possibility that new synthetic or plant based fuels might emerge which are thought to lower CO₂ output and could be used in a variety of transport, industrial and heating uses.

The problem of intermittency could be abated by one or more of these answers. It would still be difficult to have enough battery or stored hydrogen capacity should a long cold windless period emerge in winter. Each of these answers requires further work on best methods for achieving them and on how they would be rolled out quickly and paid for on a large scale. Going over to hydrogen or to electricity for the many things that currently run on fossil fuels requires large investment in new grids, cable systems, and hydrogen pipes, stores and deliveries. The same applies to other new fuels.

When might we get greater clarity on the preferred technologies, the timetables and costs?