Why alarm bells should still be ringing in Whitehall after last Friday's power cut

For immediate release

Following Blackout Friday, a week ago, the reaction of National Grid, the Electricity System Operator (ESO), is remarkable: the power cut apparently resulted from "…..an incredibly rare event….." and "…..the systems responded normally…..". Ofgem has requested a full report from National Grid by today, Friday 16 August.

That the system responded "normally" is of little consolation for 1 million people trapped in lifts and trains or otherwise inconvenienced and endangered.

Although we haven't seen precise data yet, it appears some 1200 MW of capacity, around 4% of demand at the time, was lost from the system over a period of two minutes at around 4pm on Friday 9th August 2019.

This is by no means rare: tripping of a large powerstation or the French Interconnector at full load can result in sudden loss of 2000 MW or more. When Hinkley Point C comes on line, the system will have to cope with instantaneous loss of over 3000 MW of supply when both units trip.

Perhaps it was rare that one-third of demand was being met by renewables at the time, but in future this will be the norm.

As we move towards zero carbon, it will be common in summer day-time for most energy to come from renewables or non-variable nuclear. The system needs to be able to cope with trips in these conditions.

The role of the ESO is to balance electricity supply and demand on a microsecond basis in order to maintain 50 Hz frequency. It seems they did well to avoid a cascade failure of the grid – when the rate of change of frequency (RoCof) cannot be controlled, and powerstations and transmission lines progressively trip in response to falling frequency until there is a total national blackout. In many ways we got off lightly, though that will be no consolation to those who were affected.

A number of countries have suffered such nationwide blackouts, and it can take hours, or even days, to restore the system.

The normal system response to sudden loss of supply is to increase supply from other generators, and if necessary to shed load to maintain the system in balance and avoid this cascade failure. Automatic procedures are in place for this, and they went into action on Friday.

When the details of what went wrong are better understood, it is likely that this will identify the technical deficiencies that prevented supply from increasing quickly enough, which probably include shortfalls in operating reserve, system inertia, reactive power and other services, many of which are location-specific. We have argued for some time that the current system is not fit for purpose and that further power shortages are inevitable until the system of planning for power is radically improved.

Fundamentally the problem is due to lack of planning of the power system over the past 30 years: the grid has been allowed to evolve driven by a form of market forces. This worked fine while there was plenty of despatchable generation and system inertia around. However it will not work in the future or, indeed the present as we have just seen.

The ESO needs to be able to plan and control each element of grid infrastructure, including generation. Without this our grid will be economically inefficient, resulting in costly electricity and insecurity.

We therefore need a new way of procuring and operating the grid. Among the requirements are:

- The regulator and ESO must plan, specify and procure each component of the grid.
- The private sector should ideally be involved in delivery and operation of some, or all, of the infrastructure.
- The lifetime long-run cost of infrastructure, including generation, must be met by consumers.
- Our fixation for paying over-the-odds for others to carry risk needs to change – a large part of our electricity cost is to pay for risk.
- A competitive element is needed to control prices.
- The form of planning needs to be sufficiently flexible to allow for innovation.

Blackout Friday's power cut is a wake-up call that radical change is needed in the way we plan, procure and operate our power system. Otherwise events like this will become ever more frequent.

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