

# The Grid: the change needed to get renewables connected sooner

Maddie Brooks · 3rd April 2023<sup>1</sup>

## The vision of the future

Customers will be at the heart of the net zero energy system - their collective ability to shift load will be more significant in capacity than the UK's largest generator.

The electricity system will be predominantly composed of renewables, supported by flexible resources like batteries and aggregated flexible consumer demand, connected at both transmission and distribution levels.

System management will be turned on its head - load that can shift will automatically do so in line with renewable energy output to keep system costs as low as possible for everyone. System operators will have state-of-the-art information systems to use domestic flexibility, as well as large flexible resources, to optimise the system and reduce the need for new network and generation build.

Open data on available network capacity will give applicants clear information about where to connect, and projects which are 'ready to go' will be able to jump the queue and connect to the network at pace - ensuring the benefits of low-cost renewables flow through to customers as soon as possible.

All of the above will make the transition cheaper and quicker, making the most of resources already built and minimising the cost to consumers of investment in new infrastructure and assets.

## What's going wrong now?

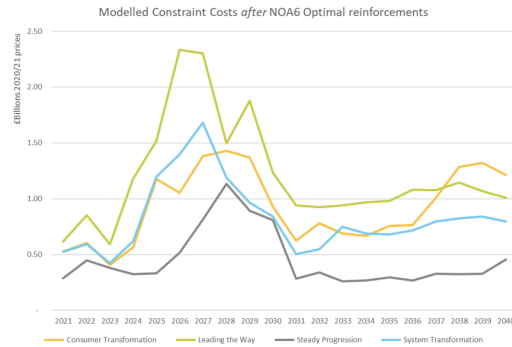
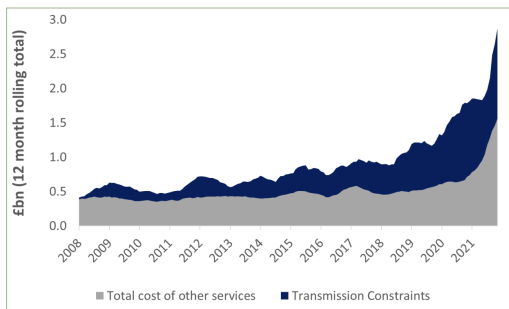
- Renewable energy developers are facing delays of [up to 15 years to connect](#) new capacity to the grid
- The transmission system cannot take renewable generation to where it is needed<sup>2</sup>. Green power is being wasted and the cost of managing these constraints is rising<sup>3</sup> and is forecast to continue (see below).

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<sup>2</sup> Across 2021 and 2022 wind curtailment amounted to a cost of £806m and this curtailed generation would have been enough to power 800,000 homes each year. Scottish wind represented 88% of the total wind curtailment volume in 2020-21 and CCGTs made up 94% of turn-up volumes in the BM over this period; amounting to average additional carbon emissions of 1.02Mt CO<sub>2</sub>e per year, equivalent to an extra 497,000 cars on the road. Source: [Drax LCP Renewable Curtailment report](#)

<sup>3</sup> Annual transmission constraint costs have increased from £170m in 2010 to £1.3bn in 2022. Source: FES 22



- Peak electricity demand (which drives investment needed in networks and generation) is forecast to double by 2040 unless smart management of load is truly unlocked
- Excessive metering requirements (the same as for gas-fired power stations) means that EVs and other consumer flexibility cannot help the system by participating in the UK's balancing market
- The GB control room is dispatched manually meaning small, aggregated assets are being skipped due to out-of-date processes
- Open code governance and a lack of clarity in the role of the ESO/DSOs in system management are resulting in opposing changes being made, which are out of kilter with the pathway GB must follow to meet its decarbonisation targets

## What needs to change?

1. **The ESO and DSOs must accept that domestic flexibility is a reliable and bankable resource** that can be used to manage demand/supply imbalances. All of their markets must be reformed, and technical barriers eliminated, to ensure domestic flexibility can participate and is valued equally to any system actions from generation.
2. **System operators must rapidly digitalise** all operations to efficiently manage a system made up of thousands of assets. Human biases, manual processes and bilateral negotiations will have no place in the future electricity system.
3. **The grid connection process needs urgent reform.** Providing potential applicants with transparent information about where there is the capacity to connect, combined with an overhaul of the connection queue process to allow 'shovel-ready' projects to jump the queue, will ensure GB stays on track to meet its renewable targets.
4. **Competition in the build of network infrastructure must be introduced** to reduce costs, introduce innovation in solutions, and speed up connection times.
5. **The ESO and DSOs must find the most effective way to reduce network congestion and keep the costs as low as possible for consumers;** be that

through reform of the wholesale market, network charges or the firmness of grid connections given.

6. **Network governance arrangements must be clarified, and processes changed to ensure vested interests can no longer get in the way of GB's decarbonisation progress.** Institutional bodies and industry need clarity about the responsibilities of each party in (a) the management of national and sub-national energy markets, and (b) setting the strategic direction for code evolution.