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Around the world, electricity systems are experiencing unprecedented changes in demand patterns as a result of restrictions on movement and business activity because of lockdowns imposed in response to the coronavirus disease 2019 (COVID-19) pandemic. In this client alert, associate Rob Broom and consultant Paul Brennan from our Energy & Natural Resources Practice look at steps being proposed in response to these changes in the UK, and consider some of the implications of the crisis for electricity generators and investors both in the UK and internationally.

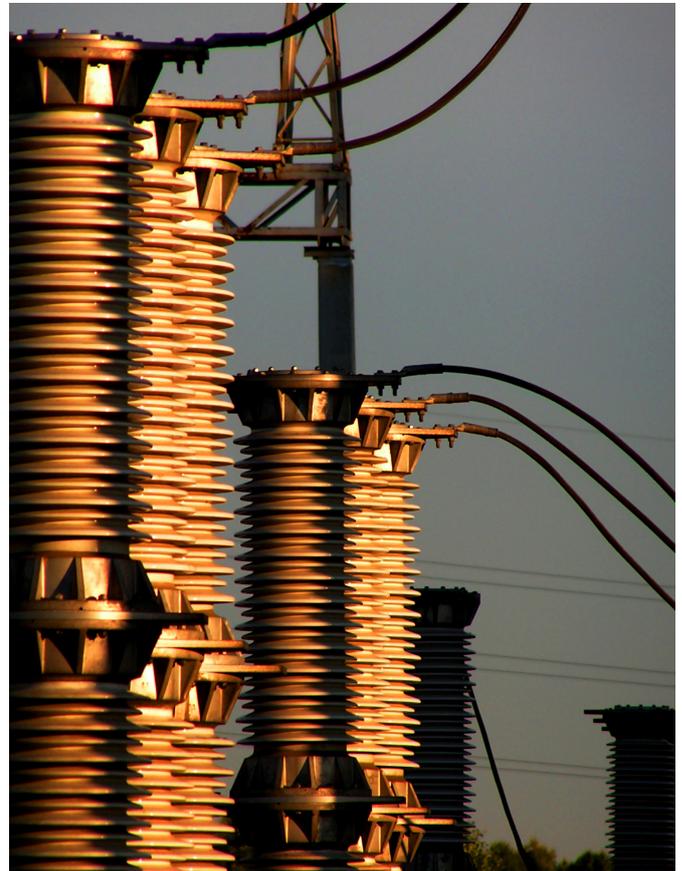
On 30 April 2020, National Grid Electricity System Operator (ESO) raised an urgent Grid Code modification proposal (GC143 “Last Resort Disconnection of Embedded Generation”)<sup>1</sup> regarding its ability to instruct Distribution Network Operators (DNOs) to disconnect embedded generation as a last resort. The ESO is seeking the powers to come into force tomorrow – 7 May 2020.

## 1. What Is the Grid Code?

The Grid Code establishes detailed rules for forward planning of the National Electricity Transmission System (NETS) maintenance and system operation, as well as technical rules for generating stations and other facilities connected to it. It also sets out the mechanics of communications required for the purposes of the Balancing Mechanism (BM). The Grid Code is maintained in accordance with the conditions of licenses granted under section 6 (1) of the Electricity Act 1989. Compliance with the Grid Code is a requirement under the Connection and Use of System Code (CUSC), as well as under electricity generation and distribution licences. However, generating plants embedded within distribution network systems are typically not of sufficient size for the generator to need a licence and neither are they party to the CUSC, so they are not directly bound by the Grid Code.

## 2. What Modification Is Being Sought?

The ESO is seeking powers that under emergency conditions and as a last resort, it may instruct a DNO to disconnect embedded generators (this is generation that is connected to the distribution network rather than the NETS) connected to the DNO’s system. This modification applies to embedded generation that does not participate in the BM, as the ESO already has the ability to turn down and disconnect BM participants.



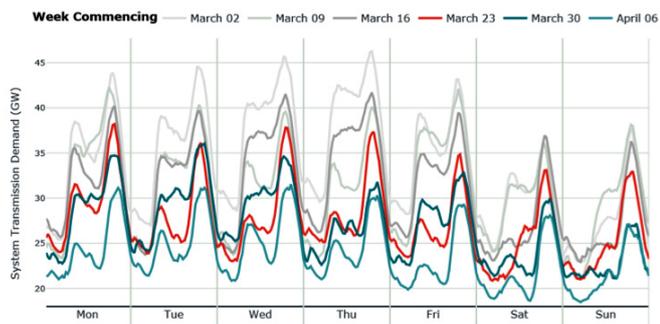
The ESO acknowledges that whilst generators participating in the BM are compensated for any emergency actions instructed by the ESO, there is no such route available to embedded generators that are not BM participants, as such, no compensation for non-BM generation will apply.

The requirement for this is due to the unprecedented societal changes brought about by the COVID-19 pandemic, which has led to demands out-turning up to 20% lower than predicted. According to research by Frontier Economics, reduced demand from commercial and industrial businesses scaling back their activities is the main reason for the drop of electricity demand on the NETS, slightly offset by an increase in domestic demand due to people spending more time at home. Electricity demand drastically changed in the weeks following the imposition of a lockdown; compared to the week of 9 March, total electricity demand fell by 13% in the week of 23 March, by 14% in the week of 30 March, and by 24% in the week starting 6 April (please see Figure 1 below)<sup>2</sup>. These reduced electricity demand levels pose new challenges for the ESO to balance the NETS.

<sup>1</sup> Grid Code modification proposal GC143 “Last Resort Disconnection of Embedded Generation,” available at: <https://www.nationalgrideso.com/document/168336/download>, accessed 6 May 2020.

<sup>2</sup> Frontier Economics, “How is COVID 19 impacting the UK electricity system,” available at: <https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-17214-how-is-covid-19-impacting-the-uk-electricity-system/>, accessed 6 May 2020.

**Figure 1: Comparison of Half-hourly GB Transmission Level Electricity Demand by Week 2 March 2020 to 5 April 2020**



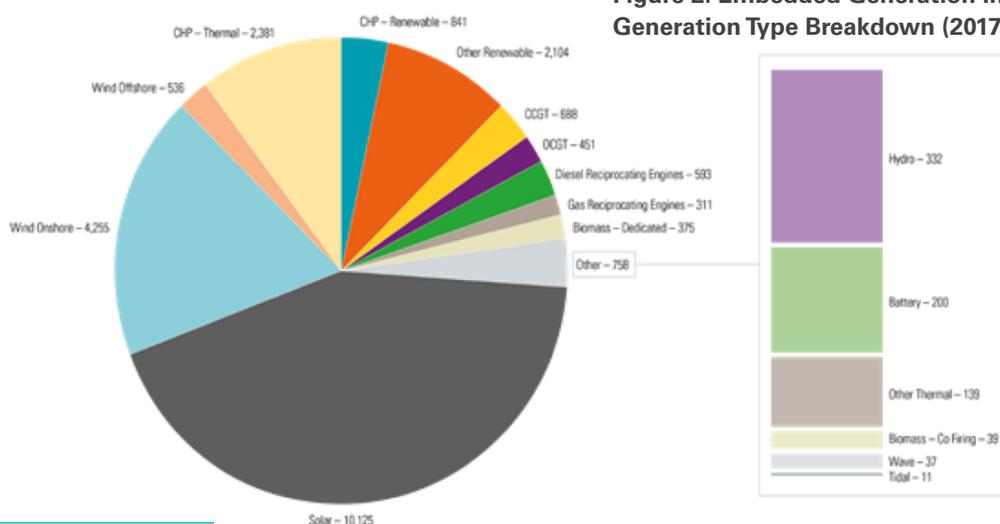
The electricity demand shown here is the transmission system demand, which is net of distributed generation (solar and wind). Increased generation from embedded solar PV and wind reduces transmission system demands. Source: Frontier Economics 3

Under the Grid Code, the ability of the ESO to make such instructions is ambiguous and the amendments requested are also to clarify the ability of the ESO to do this. The ESO also argues that if this change is not made, there is a risk of disruption to security of supply during unprecedented low demand periods caused by the COVID-19 pandemic. This is a rapidly developing situation and could not have been anticipated.

### 3. By When Is the Modification Required?

According to the ESO, the required modification needs to be implemented by 7 May 2020 as the bank holiday (commencing on 8 May) is likely to result in a period of low demand with significant operational risk. If not completed before that time, and the ESO issued instructions to DNOs to disconnect embedded generation, the DNOs may be exposed to legal risk as it would be unclear if those instructions are legally binding.

Under the Grid Code, National Grid is required to establish a panel to review and assist with any modifications of the Grid Code. Similar to other code panels, the Grid Code Review Panel consists of a number of elected representatives from various parts of the industry, which means that there is a diverse mix of industry expertise and commercial interests can be taken into account during the modification process. All changes are subject to industry consultation and are subject to Ofgem approval.



Energy-UK, which provides the only panel member that might be regarded as representing small generators, is the trade association for most of the UK electricity supply chain, and also represents suppliers, large generators and even National Grid.

Ofgem approved the proposal to treat the modification as urgent in its decision letter on 1 May 2020<sup>3</sup>, noting that at the Grid Code Review Panel meeting (held on 1 May 2020), the Panel voted, by majority, to recommend to Ofgem the modification should be progressed as an urgent modification proposal, but noted concerns including:

- The commercial impact on generators affected by emergency disconnection
- The length of time it took the ESO to bring this modification forward
- The process by which DNOs would action any emergency instruction

### 4. How Long Would the Modification Be in Force For?

The proposal is time limited and would be in force until 25 October 2020.

### 5. Comment

The ESO's suggestion that the modification is required for clarification has to be taken with a pinch of salt, bearing in mind its time limited application. The proposed change potentially will have a material change on embedded generators and, in the absence of any compensation for interruption, is likely to be regarded by embedded generators as being flagrantly discriminatory. As against that, it should be recognised that, applied correctly, the powers to require disconnection should only be used in limited circumstances, within Gate Closure, that is less than an hour ahead of the action being required.

Generators that are likely to be affected, typically solar PV and wind plants with less than 100MW capacity (solar and wind represents roughly two thirds of the current circa 30GW capacity of Embedded Generators on Britain's Distribution Networks – see generation type breakdown in Figure 2 below), are typically connected to the rest of the grid by a single circuit and are already exposed to disconnection by the DNOs experiencing in conditions on their own systems.

**Figure 2: Embedded Generation Installed Capacity – Generation Type Breakdown (2017/18 levels)**

3 Ofgem Decision Letter re Grid Code Modification Proposal GC0143 "Last resort disconnection of Embedded Generation" – decision on urgency 1 May 2020, available at: [https://www.ofgem.gov.uk/system/files/docs/2020/05/gc0143\\_urgency\\_letter.pdf](https://www.ofgem.gov.uk/system/files/docs/2020/05/gc0143_urgency_letter.pdf), accessed 5 May 2020.

When the system is oversupplied, the commercial incentives for conventionally fuelled embedded plants will ensure that they do not run, but much of the renewable energy plants in the UK are incentivised by subsidies to run even when prices for electricity are negative. Even where subsidies are not a relevant consideration, the risk of being constrained off, even at times of low demand, represents a significant threat to the income of renewable energy plants, which does not consume input fuel – as well as energy from waste plants that rely on gate fees, for that matter. Moreover, in its Modification Proposal, the ESO indicates that it intends to develop an enduring mechanism for embedded generation that parallels Grid Code OC6, which deals with emergency disconnection of consumers, without making any provision for their compensation.

This development is one that generators, their funders and investors should be alert to, not just in the UK, but anywhere in the world where large amounts of renewable energy generation have been embedded within the overall system.

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