

Connections Reform Explainer

Updated as of June 7, 2024

As the renewable energy industry pushes to meet net-zero targets, securing a timely grid connection has become a major risk to developers and their projects.

The issue of delayed grid connection is causing a significant bottleneck in the delivery of the UK's clean energy projects. **More than 700GW¹ worth of potential projects are currently waiting**, sometimes years, for a date to connect to the national transmission system. The issue of queue reform has reached a level of political notoriety, most recently being cited as a priority in the [2024 Spring Budget](#) under the growth agenda.

A series of factors have compounded the issue leading to the overwhelming size of the queue, which is hindering existing projects and deterring future investment. Factors include the **relatively low entry requirements for transmission projects to enter the queue** and the Energy System Operator's (ESO) inability to remove projects that are not progressing in their development.

This has resulted in an increasingly cluttered space that is not optimally serving the UK's green energy needs. The lack of availability and use of data, alongside how network capacity is currently modelled and allocated, are also exacerbating factors.

In response to the lengthy wait times, developers are increasingly submitting speculative applications for projects with little to no development progress simply to secure their place in the queue. Once in the queue, they are naturally hesitant to make tangible moves to invest and develop such projects for fear of not connecting to the grid in the near term, with **only 14%² receiving their requested connection date at present**.

With the current freedom to delay a project connection once it reaches the front of the queue, stalled projects continue to obstruct the line. By such industry measures, the ever-growing queue has become a self-fulfilling prophecy in need of radical reform.

The issue of the inflating connections queue is a symptom stemming from the inability of the national grid to facilitate a faster pace of connection. The **current transmission system across the UK is severely outdated** and not fit for purpose if a renewables-dominated, net-zero energy system is to be achieved.

A significant lack of transmission infrastructure and excessively long lead times for the development of new substations required to absorb connection requests are a major barrier to the energy transition.

As the issue of prohibitive connection times becomes more acute, government and regulatory authorities are responding with various ongoing reforms. **However, with the unprecedented rate of queue expansion, solutions are becoming increasingly irrelevant by the time they come to fruition.**

¹ Across distribution and transmission.

² [Connections Action Plan | DESNZ Ofgem](#)

Distribution

At the distribution level, the **Electricity Networks Association (ENA)** formulated a [Three-Step Plan](#) of short-term actions to free up 30GW of connections and improve connection dates by up to 10 years. These are:

1. **Reform of distribution connection queue management:** introducing milestones into pre-2017 and demand-connection contracts and accelerating connection customer cancellations.
2. **Improve transmission-distribution network interactions:** allow DNOs to manage connections within technical limits.
3. **Standardise firm access provisions for BESS customers:** including re-assessing the impacts of BESS projects on the network.

Active Queue Management

In late 2023, the national energy regulator Ofgem approved an amendment made by the ESO to part of the grid connection contractual framework known as the Connection and Use of System Code (CUSC). The amendment is intended to de-congest the queue at the transmission level.

The code amendment [CMP376](#), specifically, WACM7, introduces a 'Queue Management' process. Under this process, new and some existing projects would be required to meet certain 'User Progression Milestones' to demonstrate progress and thus, retain their place in the queue. **Failure to meet the outlined Milestones would enable the ESO to terminate the project and eject it from the queue, thereby cleansing the queue of unviable projects.**

One of the specific milestones put forward is the need to present an obtained landowner [Letter of Authority \(LoA\)](#) for new onshore transmission connection applications. From March 28, 2024, the specific code modification [CMP427](#) demands a certain level of project readiness by requesting confirmation that the project developer has engaged in substantive discussions with the landowner, or that the project developer is the landowner. The LoA should cover the minimum area of land required for the project technology type as per the Energy Land Density table, to be found in [ESO guiding documents](#).

To ensure projects are active, LoAs must be signed less than a year before that the date the connection application is submitted to the ESO. Failure to present a formal LoA would result in a project not being clock-started until all valid documents are submitted or, as in the case in WACM7, eventual eviction from the queue.

The ESO is exploring the possibility of applying LoAs retrospectively to the existing queue to strengthen the process. **By removing stalled projects, those with greater potential to deliver the emissions reductions required to meet net-zero targets would be unencumbered by connection delays.**

The current queue capacity is four times that required for 2050 targets and therefore the need to manage and prioritise legitimate projects is crucial to address over-supply and give greater security to target delivery. Likewise, the Milestone mechanism seeks to provide greater clarity on queue readiness, in turn strengthening the accuracy of net-zero forecasting.

However, to deliver the intended effect, the mechanism requires more stringent milestone requirements and stricter enforcement on those who fail to comply. More importantly, due to an

inherent latency built into the milestone framework to allow sufficient lead times for modification implementation and for developers to procure land rights, the milestones don't come into effect until five years after the original energisation date.

As such, **the potential of the CMP376 to address the immediate issue of the queue is limited**. With the current queue expansion rate, the time lag between queue management concept development, approval and implementation reduces the relevance of certain reform proposals.

The Two-Step Process

While only relevant to projects in England and Wales, the temporary two-step connections applications process is worth elaborating on to fully encompass the complexity of the GB connections landscape.

To stem the stream of connection applications, the ESO introduced some short-term proposals ahead of longer-term reform. One of these was the time-limited [Two-Step Process](#), agreed to run for 12 months from March 2023, that the ESO developed with National Grid Electricity Transmission (NGET). The process saw all applications (in England and Wales) receive an initial interim offer within three months of application, constituting Step One. This was to be followed by a firmed-up date with all relevant offer details in the second step provided three months later. Step Two offers would include voluntary milestones unless stated otherwise by the applicant by May 27, 2024.

The reasoning behind the Two-Step approach was to reduce uncertainty for developers by affording the ESO the time between steps One and Two to consider its new modelling of batteries and new Construction Planning Assumptions (CPAs), which would subsequently inform the second step offer with greater accuracy. The expectation was that, given the more realistic understanding of the system and reduced works reinforcement, the second step offer would bring forward the original connection date.

However, due to the unrelenting volume of new applications to the connection queue, double the original estimate, the effectiveness of the Two-Step process has waned considerably. Within the 12-month period, the ESO received more than 150GW of new applications, equating to a third of the total GB transmission pipeline. Despite new CPAs, the volume of new applications has resulted in a predicted increase in required reinforcement works exceeding that of the [Beyond 2030 plan](#). Within these parameters, most projects would ultimately receive a worse (later) connection date than their step one offer.

To mitigate this, Ofgem agreed to a three-month [extension](#) to the Two-Step offer concept that would allow the ESO to map all triggered Overhead Lines (OHL) enabling works against the Beyond 2030 plan to remove redundancies. The ESO has stated that this should ensure 60% of customers receive an improved offer, while they work on improving the remaining 40%.

As a result, applications currently waiting on a Step Two offer will receive it by no later than June 2024, while new applications (received between November 27, 2023 and February 29, 2024) will have the clock start date pushed to March 1, 2024 (and thus will receive an offer by latest June 1, 2024).

Implementing solutions, even as short-term stop gaps, is proving increasingly challenging with the connections conundrum as it stands. The need for an overhaul of the existing system is critically overdue while significant resources are being spent on managing unsustainable solutions.

Connections Reform

Reflecting the pace at which connections reform is urgently required to meet net-zero targets, the ESO published its [Connections Reform](#) final recommendations in December 2023. The reform is comprised of a five-point action plan targeting the following areas:

1. **Transmission Entry Capacity (TEC) Amnesty:** processing ~4GW of applications that have agreed to termination or reduction by September 2024.
2. **Revised modelling of Battery Energy Storage Systems:** updated modelling of the network impacts of BESS as detailed in the Construction Planning Assumptions (CPAs) reveals new assumptions that afford faster BESS connections while simultaneously freeing up network capacity for other projects.
3. **Construction Planning Assumptions (CPAs):** assumptions made around volume and reductions for various technologies in the connections queue. Such assumptions steer necessary network reinforcements that influence connection dates and costs. The ESO is undertaking a Transmission Works Review (TWR) based on revised CPAs that should reveal which transmission works are no longer necessary, and thus, expedite project connection dates. This process is now coordinating with the Beyond 2030 plan to remove any overlap in proposed works on OHLs. Updated contracts with revised connection dates are to be announced in the summer of 2024 (see Two-Step offer).
4. **Queue management:** see CMP376 code modification.
5. **Non-firm connection options for BESS projects:** accelerating BESS connections by temporarily providing interim non-firm connections while non-critical transmission works are carried out.

In addition to the five points outlined above, the **ESO is suggesting a holistic structural change to the connections application process** due to go live in January 2025. This enduring reform would take over from the three and five step plans that are acting as intermediary measures. However, actions may be implemented before this to reflect urgency, i.e., in the case of CMP376/472 as listed above.

The model, aforementioned in their June consultation as the **Target Model Option 4 (TMO4)**, would introduce an annual early application window (lasting 12 months) and a two-gate process method for further queue management.

The two-gate process works by 'Gate 1' offering (or rejecting) a contract for a connection date and location based on a coordinated network design. This is followed by 'Gate 2' bringing forward 'priority projects' that demonstrate progress, ultimately determining the queue position for all entrants. As an entry requirement for Gate 1, a LoA for a land lease from a landowner will be required to ensure a certain level of commitment from all project requests and aims to stem the current monthly pace of 40GW of new applications.

The process will be applied to all new projects requesting entry into the queue and aims to reward well-developed projects to optimise fast-paced emissions reduction. Managed by the Connections Process Advisory Group (CPAG), the ESO's initiatives are estimated to release 100GW capacity within the grid, more than is connected today.

TMO4+

On April 16, 2024, the ESO shared their proposal to extend the 'first-ready, first-served' approach to the existing queue through its [TMO4+ model](#). Only projects in the transmission queue and any distribution projects impacting transmission will be subject to the changes from the new model. Discussions around how to adequately define 'ready' to make a substantive difference to the size of the queue, and how this process will be implemented will be consulted on through Connection and Use of System Code (CUSC) modification working groups (specifically CMP434 and CMP435) and with industry throughout the second half of 2024.

The process will look to introduce planning consent requirements to gate two, with liabilities, securities and milestones only being applied to projects once they meet that stage and gain a firm connection date.

Finally, Ofgem will be approached with the necessary code modifications to implement the decided-upon modifications. Projects in the existing queue will then be afforded a **transitional period** to prove they have met the gate two criteria necessary to keep their position. A more detailed timeline and rationale for the TMO4 can be accessed via the ESO's [GB Connections reform document](#).

Connections Action Plan

Reflecting on the ESO and ENA's recommendations, Ofgem and the UK Government (DESNZ) devised their own [Connections Action Plan](#) (CAP) in November 2023 outlining the short- and medium-term vision for future connections. The plan adopts the ESO's recommendations of needing to move away from a 'first-come, first-served' delivery system with ambitious aims to reduce connection delays from five years to six months for Transmission Owners (TOs).

In summary, the focus areas of the CAP are:

1. Raise entry requirements.
2. Remove stalled projects.
3. Better utilise existing network capacity.
4. Better allocate available network capacity.
5. Improve data and processes and sharpen obligations and incentives.
6. Develop longer term connections process models aligned with strategic planning and market reform.

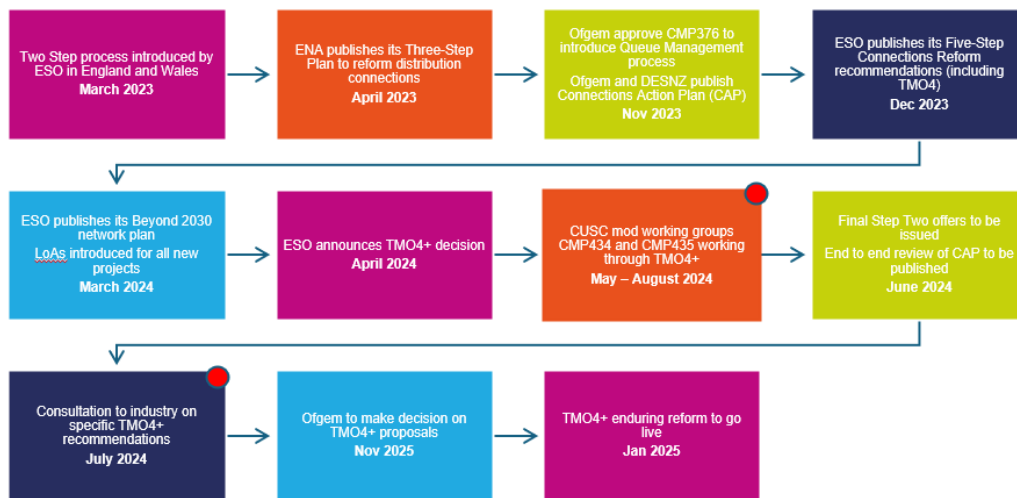
Many of the steps in the CAP employ the techniques recommended by the ESO to achieve their objectives, for example, the introduction of queue milestones as detailed in the Active Queue Management section. The CAP is to work in tandem with the [Transmission Acceleration Action Plan](#) (TAAP) and other initiatives such as [Accelerated Strategic Transmission Infrastructure](#) (ASTI), Strategic Spatial Energy Plan (SSEP) and the Beyond 2030 plan to harmonise network optimisation. It is overseen by the newly created Connections Delivery Board of Ofgem (CDB), featuring industry professionals from a variety of technology types. The CPAG and the ENA Strategic Connections Group (SCG) report to the CDB and are the first point of call for testing additional recommendations for future changes. **In June 2024, an end-to-end review of all of the proposed actions in the CAP and their progress thus far will be presented to the CDB.**

Despite the promise of these recommendations, questions remain about the practical delivery of such solutions. Industry concerns regarding the ESO's TMO4+ recommendation include the frequency of

allocation windows, timing of queue allocation (and how to balance project acceleration with readiness), the need to monitor and evaluate the success of the suggested steps, as well as questions relating to how the administrative load of such new processes might risk delayed reform delivery are all ongoing discussions to be reviewed. Meanwhile, there is also the pressing issue of what is being done at present to tackle the queue entrants up until the reform's optimistic start date of January 2025.

CONNECTIONS REFORM TIMELINE

● Industry input



A contentious consideration that will require extensive deliberation is how to best prioritise and fast-track projects in the ESO's 'Gate Two' step using the best evidence and avoiding unintended consequences to ensure fairness in the new system. Demanding sufficient level of project commitment while not raising the barrier so high that project risk paralyses projects will be key. Similarly, ensuring that projects are incentivised to progress towards Gate Two and do not create a backlog of projects at Gate One will require appropriate instruments, e.g., a capacity holding charge.

Likewise, ensuring that this step does not incentivise a 'race to development' between project developers is key to maintaining robust decarbonisation projects from a variety of technologies. With the expected introduction of an SSEP outlining the required energy technology mix for the country, there will need to be close coordination with the connections queue to ensure project types accelerated reflect the desired mix. **Deciding upon a solution that is most fair and incurs the least detriment to developers necessitates a transparent and open process while balancing the necessary pace of change.**

In addition to the changes being made to existing processes, the ESO is also introducing tools to foster greater transparency and smarter utilisation of the grid. The operator's plan for **Connections 360, a digital visualisation of grid capacity across the UK**, responds to calls for greater digitalisation and the use of data to aid developer decision-making. The digital map will allow developers to see the

density of substations in terms of developers present by specific technology types and make strategic decisions to accelerate project connection dates.

The proposed collective changes mirror the direction of the network system which is moving from a reactive to a strategic approach to planning to meet clean energy targets. The effective coordination of the various moving parts of current and future reform is critical not only for delivering the pace of reform but also for fostering an accessible environment for existing and future investors.

In terms of attracting foreign investors, the market needs to exhibit a more predictable and inclusive approach to changes so as not to damage investor confidence and jeopardise the pace of the energy transition.

While the connections framework undergoes remodelling, focus on the urgency and scale of investment in network infrastructure cannot be lost. **Regardless, whether more radical reform is required to resolve the connections issue sustainably remains to be seen.**

To stay up to date with the reforms, register [here](#) for the ESO's monthly connections webinars.