

To interested parties

Email: connections@ofgem.gov.uk

Date: 16 May 2023

Open letter on future reform to the electricity connections process

Great Britain (GB) is at a pivotal moment in its journey towards net zero. With the government's recent '*Powering up Britain*' publication promising to deliver the new nuclear, offshore wind and solar power generation essential to achieve our decarbonisation goals, there is a pressing need to ensure our energy system is equipped to enable this substantial increase in generation capacity and growing demand.¹ Ensuring these assets can connect when and where they are needed will be crucial in achieving net zero, as well as in delivering affordability for consumers and maintaining security of supply.

We need to take action **now** in order to ensure we are on track for 2035 and 2050.² Over 40% (120GW) of all new generation capacity holding transmission connection agreements today have connection dates of 2030 or beyond – with the impacts of these issues cascading down into the distribution network. This must change – but it must change intelligently, given that we also know that the total contracted capacity exceeds ESO's predicted total future generation under every scenario in 2030 and the majority in 2050.³

Many of the building blocks to address this are already coming into place. Through our RIIO regulatory price controls, we are enabling strategic investment in network infrastructure to ensure the network can be built ahead of need, and continue to work with industry to drive forward rapid improvements to connections processes which should start to bring down connection times. However, more action will be needed. There must be a **fit for the future connections regime**. This letter sets out how we, alongside government and industry, will work to reform the connections process for all parties and ensure it is responsive to customers' needs and ultimately fit for the net zero transition. This will build towards a joint

¹ [Powering Up Britain - Joint Overview \(publishing.service.gov.uk\)](https://publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1144444/powering-up-britain-joint-overview.pdf).

² References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document to refer to GEMA, the Gas and Electricity Markets Authority.

³ ESO [Future Energy Scenarios 2022 | ESO \(nationalgrideso.com\)](https://www.eso.org.uk/~/media/ESO/2022/Future-Energy-Scenarios-2022.pdf), figure ES.E.01 at page 155.

action plan with government later in the summer, which we intend to provide clarity on key improvements to deliver the change needed.⁴

Our objective is to see **electricity connection offers with shorter average connection dates which better meet customers' needs and enable a timely transition to net zero**. Considering the scale of the challenge, we will consider whether substantial changes to the current connections queue methodology are required and how changes are applied to both new applicants and those parties already in the queue with a connection agreement, while ensuring progress can be made quickly. This review will sit alongside existing government and industry initiatives.

We will take a **central role** in driving progress on the reform of connections. We will monitor the progress of industry initiatives to ensure these are translating into benefits for consumers, in terms of the scale and management of the queue and, crucially, earlier connection dates. We will convene industry to drive further action as and when needed. Working closely with government, we will provide the necessary leadership and ensure an industry-wide collective focus on the right issues and options, bearing in mind our objective, desired outcomes and the evolving longer-term direction.

We will carefully consider the Electricity Network Commissioner's recommendations on infrastructure and acceleration when published, align with the strategic aims from Ofgem's corporate strategy and the government's '*Powering Up Britain*' package, and continue to engage with and reflect on recommendations by the BEIS Select Committee on decarbonisation of the power sector, and the proposed Strategy and Policy Statement for energy policy.⁵

We welcome views from stakeholders on the proposals presented in this letter to connections@ofgem.gov.uk by **16 June 2023** – in particular, on:

- The nature and priority of connections issues (Section 1 – *The challenge*);
- Priority areas of focus for Ofgem (Section 4 – *What you can expect from us*);
- Our proposed objective, outcomes and guiding principles (Annex A); and,
- The illustrative reform stages and options for consideration (Annex B).

We intend to hold a webinar in June on our proposals and invite registrations of interest to the email address above. We will review and take account of stakeholder submissions, as well as the outcomes of our webinar and roundtable, as we take forward fuller analysis on

⁴ [Powering up Britain - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/powering-up-britain); [Strategy and Policy Statement for energy policy in Great Britain - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/strategy-and-policy-statement-for-energy-policy-in-great-britain)

⁵ [New Electricity Networks Commissioner appointed to help ensure home-grown energy for Britain - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/new-electricity-networks-commissioner-appointed-to-help-ensure-home-grown-energy-for-britain); [Our Strategy \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/our-strategy); [Powering up Britain - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/powering-up-britain); [Strategy and Policy Statement for energy policy in Great Britain - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/strategy-and-policy-statement-for-energy-policy-in-great-britain).

the various options and stages of reform under consideration. We will then move to make a robust assessment of key options and associated regulatory questions, to drive forward the solutions we see as essential to accomplish our net zero ambitions. Our joint action plan with government this summer will represent a key milestone in the next phase of connections reform and set the direction for future action to deliver the progress needed.

Yours faithfully,

Akshay Kaul

Interim Director of Infrastructure and Security of Supply

Overview: Review of electricity connections arrangements and future reforms

Here we set out the challenges facing the connections framework, with increasing application volumes contributing to long connection times. We also explore what may be needed to tackle the emerging issues – through strategic network investment, efficient and flexible network management and a fit for the future connections process. We set out the expected stages of reform, and our role in reviewing the electricity connections arrangements, alongside government and industry.

This document has four annexes, which provide further detail. They are as follows:

- Annex A – Proposed objective, outcomes and guiding principles for reform;
- Annex B – Illustrative reform stages and options for consideration;
- Annex C – Key dependencies and longer-term outlook; and,
- Annex D – Support for Distribution Queue Optimisation.

1. The challenge

The scale of energy system transformation as we move towards a net zero system is substantial. The system is facing growing volumes of connections at all voltage levels, with changing characteristics and a changing impact of connections.

Progress to date and emerging issues

The 'Connect and Manage'⁶ regime has enabled the rapid connection of significant amounts of renewables to the grid, accelerating generation connections which would otherwise have had to wait for transmission network upgrades. Spare capacity is becoming scarcer – congestion management costs are rising and localised 'enabling' works are increasing.

The step-change in investment in distributed energy resources has also contributed to significant congestion across parts of the distribution networks in recent years. Distribution companies have responded to these constraints by taking steps to unlock capacity and speed up connection dates – introducing non-firm connections and exploring other innovative solutions, supported by our RIIO innovation funding and the Access Significant Code Review (SCR).⁷ But generation customers still face delays, increasingly in regions of transmission congestion, alongside more localised constraints. This is the case even while

⁶ The 'Connect and Manage' regime introduced in 2010 enables generation to connect to the grid in advance of 'wider' transmission network upgrades, with the resulting congestion managed operationally through market solutions (ie balancing interventions by the ESO).

⁷ The [Access SCR - Final Decision \(ofgem.gov.uk\)](https://www.ofgem.gov.uk/access-scr-final-decision) recently introduced reforms to improve certainty and consistency of non-firm offers, while earlier work on also supported the development of novel approaches.

demand connections are now also growing across the system – a trend that is expected to continue with the electrification of industry, heat and transport.

Increasing application volumes

The crux of the challenge is the substantial increase in volume of connection applications at all voltage levels, putting greater pressure on systems and processes. Over the last five years, the volume of new connection offers provided by the Electricity System Operator (ESO) has grown tenfold,⁸ with an increase in applications of 80% in the last year alone.⁹ This has led to significant growth in the amount of new generation capacity in the transmission queue, with 280GW now holding connection agreements. This is despite the fact that the total contracted capacity exceeds (in almost every Future Energy Scenario) the ESO's predicted total generation for both 2030 and 2050.¹⁰

On the distribution network, volumes of connection applications have also increased and are increasingly impacted by transmission constraints, reinforcement works and associated delays – even if there is spare capacity locally.¹¹ This interaction requires improved coordination across the transmission-distribution interface.

Interactivity and attrition in a first-come-first-served queue

Connection applications are currently managed on a first-come-first-served (FCFS) basis, with each new connection request being considered in light of those in front of it – irrespective of a project's status or viability. In a constrained system, with long lead times to build new capacity and with over 40% of projects at transmission ultimately failing to connect (in part reflecting the excess of contracted capacity against future FES scenarios) customer applications are being significantly delayed by non-viable or slow to progress projects.¹² This creates a risk that, without swift action for all connection agreements, connection delays present an obstacle to meeting our decarbonisation goals.

Long connection times

As a result, over half of generation customers in the transmission queue today (ie holding connection agreements) have a connection offer date at least 5 years in the future, with over 10% due to wait 10 years or more. This trend is continuing, with 70% of recent

⁸ ESO, GB Connections Reform - Case for Change, December 2022.

⁹ ESO Connections Data.

¹⁰ ESO [Future Energy Scenarios 2022 | ESO \(nationalgrideso.com\)](https://www.nationalgrideso.com), figure ES.E.01 at page 155.

¹¹ The scale of the transmission contracted background means that increasingly distribution applications also have a potential impact on the transmission network. This interaction therefore needs to be assessed and reflected in their connection offer.

¹² National Grid ESO, [GB Connections Reform: Case for Change](https://www.nationalgrideso.com), December 2022. For new applications between 2018-2022, 42% have fallen out of the process (withdrawn, rejected or terminated).

applicants (offered in the last 12 months) receiving connection dates that are 5 or more years away and over a quarter receiving connection dates beyond 2032 – some beyond 2037. While many of these are large, complex projects with long lead times due to a range of factors, this is still too long.

Complexity has increased at all stages of the process, as has the interactivity of assessments needed to deliver a connection offer. This leads to increasing wait times, including the time to receive an offer, reflecting the challenges the existing processes face in adapting to substantial increases in customer demand.

2. What is needed to tackle this

Delivering new connections at the scale required on a sustainable long-term basis will need a combination of three factors: **strategic network investment** to bring forward significant new network capacity efficiently, and at the right time and place; **efficient and flexible network management** to get the most out of the existing network; and a **fit for the future connections process**, which optimises allocation of available capacity so that connections can proceed at pace.

Strategic network investment: We are enabling significant increases in network build, including strategic investment, over the coming years, which will allow more assets to connect. Under our regulation, network companies have been able to undertake investment in anticipation of future demand, but there may have been factors that reduced their willingness to do so. Under the RIIO-2 controls, we have taken active measures to accelerate the investment needed to meet decarbonisation targets, including to encourage the network companies to build *ahead* of investment need (ie, where grid upgrades anticipate new low carbon generation and demand requirements from connecting parties and grid capacity is expanded in a planned, co-ordinated manner). This represents action we are taking **now** to equip GB with the infrastructure needed to connect the 50GW of offshore wind planned by 2030 and further decarbonise the GB energy system. Government also recognises the need to accelerate transmission build and has ambitions to halve the time it takes to build this infrastructure.¹³

This increased investment in anticipation of future demands approach has already begun – with the c.£20bn Accelerated Strategic Transmission Investment (ASTI) framework at transmission, our load related funding settlement in RIIO-ED2 covering the local distribution networks (which has almost doubled annual allowances in network upgrades and includes a suite of uncertainty mechanisms to enable funding to increase further if

¹³ [British Energy Security Strategy](#), at page 24.

more demand emerges than anticipated), and will continue through our consideration of models for future price controls.¹⁴ We are working to introduce a Centralised Strategic Network Plan (CSNP) to identify the network upgrades needed to meet 2035 and 2050 decarbonisation targets, and work is underway to determine the scope and governance of local level 'Regional System Planners' (RSPs).

Efficient and flexible network management: We must use all available network capacity – new and existing – as effectively as possible to enable us to maximise the number of parties that can be connected. To do so, we will need improved network monitoring at all voltage levels, with widely available, standardised data enabling the use of flexibility. This network monitoring is being delivered through the RIIO-ED2 price controls, where DNOs have received substantial IT & Telecoms (IT&T) funding, including to cover the £166m of forecast costs to install monitoring equipment submitted by DNOs. When utilised in conjunction with advanced modelling techniques and aggregated smart meter data, DNOs will have a more detailed understanding of network conditions.

In addition to the improvements being delivered in RIIO-ED2, our consultation on the future of local governance and institutions sets our proposals to ensure the roles and responsibilities for the delivery of key distribution system operation functions are fit for future to deliver the system we need. These include introducing a market facilitator for flexible resources to support unlocking greater value from flexibility and focusing the DNOs role on enhanced system operation to ensure efficient and flexible network management.¹⁵

A fit for the future connections process: Alongside network investment, substantial reforms are needed throughout the connections process to address the underlying bottleneck in capacity awaiting connection today and in the near future.

To guide us in this crucial stage of reform, we have devised a clear overarching **objective**: *to see **electricity connection offers with shorter average connection dates which better meet customers' needs and enable a timely transition to net zero.*** Further to this, we have set out the **outcomes** we think we need to achieve, alongside **principles** to help guide our reform work, in Annex A to this letter.

More transparent and standardised information across the system should help customers more readily identify suitable connection locations, reducing pressure on application systems. We have been supporting the industry to develop a standard for network data provision and signalled our intent for it to be used widely across industry. We encourage

¹⁴ [Decision on accelerating onshore electricity transmission investment | Ofgem](#); [Consultation on frameworks for future systems and network regulation: enabling an energy system for the future | Ofgem](#).

¹⁵ [Consultation: Future of local energy institutions and governance | Ofgem](#).

industry to move swiftly to implement and extend this consistency in providing transparent, accessible data for customers.¹⁶

Reforms to how the queue is modelled and managed, alongside better coordination across system boundaries, can help streamline and reduce offered connections times to ensure projects which are ready to proceed can progress more quickly.

We are actively considering options which could deprioritise projects which are not making progress to allow well-developed projects to proceed. The scale of the challenge today means we will consider all necessary reforms (applicable to both the existing queue and future applicants) in order to deliver the level of change required (ie to meet our overarching reform objective). When network capacity becomes available, we will explore how to ensure we can make best use of this capacity to advance connection dates (eg by allocating to projects that are ready to connect).

Further reforms may be needed to integrate connections processes with strategic investment approaches and to better reflect the realities of the changing system, as the scale of connections means offers become increasingly complex and interactive.

Overall, an improved connections process – underpinned by the right network infrastructure and management – will help to reduce grid congestion, enhance innovation and investment (current and future), lower consumer bills (through fewer balancing interventions by the ESO), as well as accelerate our progress to net zero.

3. How we are delivering this

There is an urgent need for rapid progress to address the scale of the queue and to start to bring forward connection dates for both generation and demand customers. We are supporting near-term industry initiatives to deliver improvements and benefits in the next 12 months. However, we must prepare to go further, considering wider reforms over the medium-term, and ultimately will likely need to reform the connections process to one which is more fundamentally suitable for a growing and more strategically planned future network.

Short-term action (2023):

We will continue to work with and challenge the network companies, ESO and industry stakeholders to drive forward targeted measures at pace to address key issues.

¹⁶ We have signalled our intent for an industry-wide standard here: [The Common Information Model \(CIM\) regulatory approach and the Long Term Development Statement | Ofgem](#). This should support improved, standardised information to support whole system visibility for generation connections.

These improvements are being progressed primarily by two industry bodies: the **Energy Networks Association** (ENA) and the **Electricity System Operator**. Their work programmes (covering both distribution and transmission) are taking forward initiatives that include better connections queue management and improved network modelling assumptions underpinning connection offers. More detail on these initiatives can be found in Annex B and in associated industry updates.¹⁷

We are pushing forward this work, providing regulatory guidance and direction, to ensure rapid and material progress. We expect that these targeted improvements will deliver tangible benefits to customers, removing projects which are not progressing from the queue, improving connection dates and enabling shovel-ready projects to connect ahead of those who may not be. Through the ESO's 5-point plan, it is expected that the majority of existing projects (representing 280GW capacity) will see improvements in connection dates of between 2-10 years, with new offers by March 2024 and reduced transmission reinforcement works in many cases. The ESO will produce a programme by the end of May, for the period up to March 2024, indicating when customers should expect to hear about the impacts of remodelling on their connection contracts. This benefit will also carry through to new applications and distribution connections that impact transmission, many of which will also see shorter connection timescales.

At distribution, initial proposals on queue management have the potential to remove over 1GW of older projects in the connections queue and bring forward connection dates for up to 6GW capacity, while other initiatives are expected to bring additional benefits. We confirm our explicit support for Distribution Queue Management at Annex D of this letter. We are monitoring the impact of these changes closely to determine the extent of further interventions needed.

Medium-term improvements (now – 2025):

While targeted near-term measures should deliver swift improvements, we expect industry initiatives, with support from Ofgem and government, to consider wider reform options across transmission and distribution. The ESO's Connections Reform Project and the ENA's Strategic Connections Group are working collaboratively to consider the case for change, and exploring options for more substantial reform of connections processes.

We are closely engaged in this important work and will assess the progress made and emerging direction to ensure any gaps are identified, rapid and substantial progress is

¹⁷ [Improving and accelerating customer connections – Energy Networks Association \(ENA\)](#); [Our 5-point plan to manage constraints on the system | ESO \(nationalgrideso.com\)](#); [Two-Step offer process | ESO \(nationalgrideso.com\)](#) – letter to industry.

delivered and any further areas for reform can be identified. We will provide regulatory guidance and direction on strategic questions and the emerging direction of reform as needed, informed by our own work to identify the scale and type of reform required to deliver a more fit-for-purpose electricity connections framework.

Over this timeframe, we expect to see a revised connections process alongside wider coordinated improvements to the connections regime, and substantial shifts in the quality and transparency of data available to connecting parties. This, in tandem with the wider work underway to accelerate network investment, will collectively deliver tangible benefits for connecting customers in the shape of earlier connection dates, while ensuring the connections processes keep pace with developments on the system and are fit for the future to manage the changing nature and scale of applications.

Longer-term outlook (2025 – 2030+):

For the longer-term, we will need to ensure the connections regime and access arrangements develop in line with wider system changes.

Wide-ranging energy market and system planning reforms are under consideration on this timeframe: through REMA¹⁸, the introduction of the Future System Operator (FSO)¹⁹, network charging and access reforms, work on regional system planners (RSPs), and evolving strategic planning approaches. The Electricity Networks Commissioner’s findings on how we can accelerate progress on network infrastructure are also anticipated to inform the future direction.

Our immediate focus is on the short and medium-term process reforms which are necessary to deliver material improvements to connection times. In taking this work forward, we will seek where possible to align with, or ensure arrangements are adaptable to, potential longer-term directions under consideration.

In due course, once the wider direction of travel is clearer, we will consider the most suitable enduring connections and access arrangements and any further changes which may be needed to ensure that the connections regime works effectively with wider system and market reforms. This could involve changes to charging signals and access allocation, including through mechanisms such as auctions. The connections regime could potentially become more closely integrated with system planning, and may involve changes to arrangements such as Connect and Manage.

In Annex B, we outline an illustration of how stages of reform could progress.

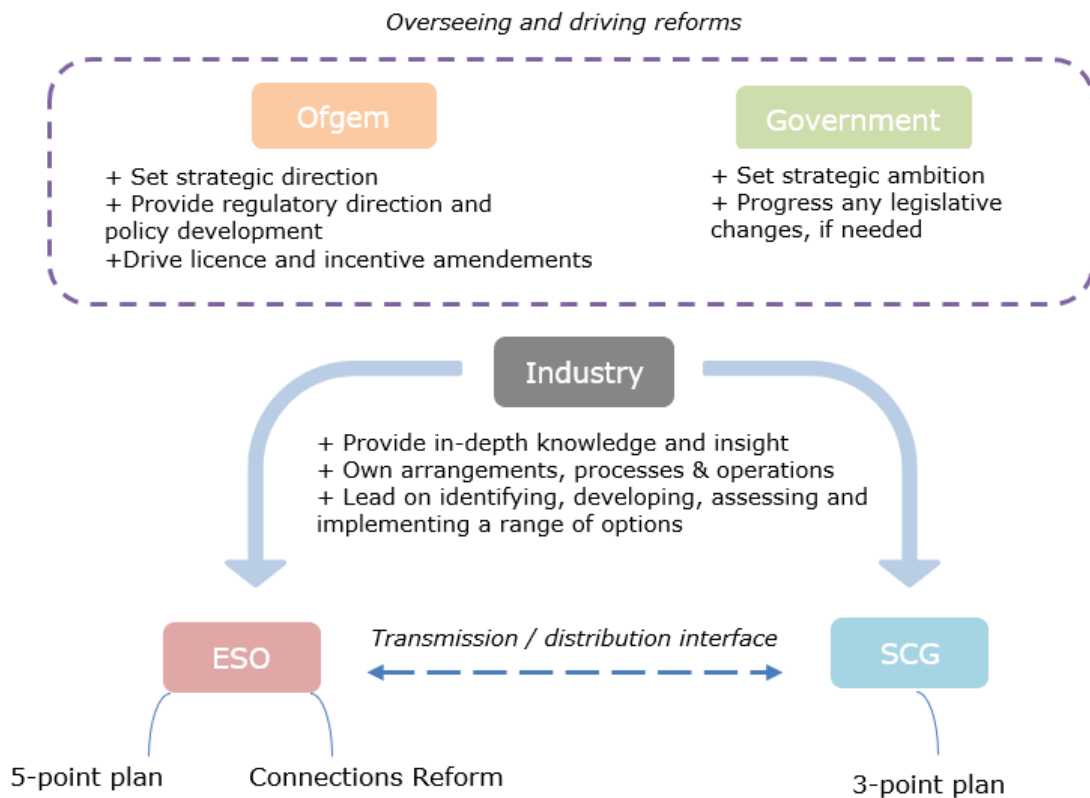
¹⁸ [Review of electricity market arrangements - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/review-of-electricity-market-arrangements)

¹⁹ [Joint Statement on the Future System Operator - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/joint-statement-on-the-future-system-operator)

4. What you can expect from us

Ofgem, government and industry must all play their part to deliver the rapid and ambitious change we need to see. Industry initiatives – notably the ESO’s 5-point plan, its Connections Reform programme and the ENA’s Strategic Connections Group – are beginning to deliver important change in the near term and developing thinking on wider reform options. We will monitor the progress of these initiatives to ensure they are translating into benefits for consumers, in terms of the scale and management of the queue and, crucially, earlier connection dates. We will convene industry to drive further action as and when needed.

Figure 1 – Our role within the review of electricity connections arrangements and future reforms



We will take a **central role** in driving progress on the reform of connections arrangements, including through the industry initiatives. Working closely with government, we will provide the necessary leadership and ensure an industry-wide collective focus on the right issues and options, bearing in mind our objective, desired outcomes and the evolving longer-term direction. Close collaboration with key stakeholders (including the ESO, notably on its upcoming consultation on Connections Reform) will be essential to inform this direction.

Figure 1 illustrates the collaboration between Ofgem, government, the ESO, SCG and industry initiatives.

As signalled in the government's *Powering up Britain* report, a connections action plan is underway, due for publication later in the summer. We are working closely with government on connections arrangements – with broad alignment on our goals and aspirations for reform – and intend to deliver this plan together. This will provide clarity and direction on the key reforms to be considered and the way forward as we move towards implementation.

Solutions could cut across multiple processes and rules including those owned by industry. We will work with and drive all partners to enable delivery depending on the outcomes, building on the strong engagement with industry-led initiatives and convening stakeholder groups as necessary to fully explore key options. To accelerate momentum towards reform, we and government will shortly be jointly hosting a connections roundtable with network company leaders.

Our work

To inform the action plan, we will be reviewing incremental improvements to the current connections regime. In parallel, we will consider and assess the range of potential further solutions, building on industry thinking and providing guidance around the nature and stages of reform that may be required to move towards a more fit for the future electricity network connections framework which allows the new generation and demand projects needed for net zero to connect efficiently and cost-effectively.

Assessing emerging options and direction of travel

In view of the scale of the challenge, we will consider whether substantial changes to the current connections queue methodology are required and how changes are applied to both new applicants and those parties already in the queue with a connection agreement. We will consider whether access to the system needs further controlling, and the different ways that this could be done, looking across both generation and demand. We will also consider how to prioritise to make best use of the available capacity, including the potential roles for connectees in making those trade-offs, and ensure those that are ready to connect can do so more quickly.

We are not seeking to duplicate industry thinking to date, but to complement it. We will build on the options developed in the ESO's upcoming consultation, support and facilitate further industry action, and provide regulatory direction and support where needed.

In the longer-term, we will consider whether charging and access signals or other reforms are required to improve utilisation of the system and allocation of capacity. We are conscious that connections reform will occur in the context of potential wider longer-term

reforms and that those interactions must be considered. We set these out in more detail in Annex C.

Monitoring and driving progress

We will continue to work with the ESO and SCG, wider stakeholders and government to ensure the connections process is an enabler of decarbonisation and not an obstacle. We will support creating a clear and transparent picture of the current status of connections across the system, through improved data and close monitoring, as a basis to assess the impacts of reforms and allow progress to be tracked. Where we identify a risk of gaps in priority areas, or the need for action to support swift delivery of benefits, we will work with all parties to address this.

Providing regulatory direction and taking forward actions

We intend to focus on key strategic and regulatory questions, where we anticipate reforms may need clarity to proceed to their fullest extent, and areas where we need to take specific action. Notably, we expect to consider questions which may involve: changes to existing obligations or principles, those which involve trade-offs between individual customers and the wider system, and navigating the application of reforms to existing customers.

Informed by this picture, we will also actively consider any changes which may be required to obligations and incentives for DNOs, TOs, and the ESO to ensure standards and metrics support good connections service, including timely connection offers and appropriate connection times, underpinned by accessible, standardised data. This will include considering the extent to which Connections Standards of Performance ²⁰ might need to be amended to support these wider reforms, and ongoing work to ensure DNOs' Long Term Development Statements are based on consistent data standards, in addition to further work to improve this for wider data sources across distribution and transmission.

²⁰ This refers to the Electricity (Connection Standards of Performance) Regulations 2010.

Annex A: Proposed objective, outcomes and principles for reform

Our objective for connections reform is to see **electricity connection offers with shorter average connection dates which better meet customers' needs and enable a timely transition to net zero**. This should be part of a transparent and auditable process, underpinned by standardised and accessible data. This objective is underpinned by our principal objective to protect the interests of current and future GB energy consumers (and our other statutory duties). It is also guided by our Consumer Interests framework and strategic priorities, by ensuring connections arrangements are fit for the future and support a timely and efficient transition to a secure and resilient net zero future system, in line with government decarbonisation and energy security objectives.²¹

We have identified a set of reform outcomes which we consider are key to delivering our aims for connections arrangements - we will continue to consider any potential for more specific supporting target outcomes or indicators of success and welcome stakeholder views:

- **Transparent, consistent data giving applicants advance, granular insight into expected grid capacity and level of network investment needed** – to equip parties across the system with information on when and where is optimal to connect, enabling streamlined, well-informed applications.
- **More robust connection applications, enabling well-progressed projects to proceed** – to ensure well-developed connection projects, including new technologies and business models, can deliver when ready and are not unduly delayed by projects which are not ready to proceed.
- **Reforms deliver improvements swiftly, enabling shorter average connection dates to be offered to customers** – at both transmission and distribution, to meet net zero pathways for a secure, resilient low carbon system, through improved connection processes and planning assumptions and approaches.
- **Greater coordination and consistency across system boundaries, supporting more consistent outcomes and efficient and coordinated approaches** - particularly across transmission and distribution, and to support the planning of network expansion and efficient use of network capacity on a whole systems basis.

We have also developed a set of overarching principles²² to guide our review, alongside our wider statutory duties, as shown in **Table 1**. They will be integral in our assessment of the options already identified by industry, as well as the illustrative stages of reform.

²¹ [2023/24 Forward Work Programme | Ofgem](#) at pages 6-8.

²² To be clear, these guiding principles have been informed by, and are consistent with, our statutory duties and do not take precedence over our statutory duties.

Table 1- Our overarching principles that will guide the review of electricity connections arrangements

Guiding Principle	Description
<p>1</p> <p><i>Reforms deliver benefits to current and future consumers</i></p>	<ul style="list-style-type: none"> • Reforms to the connections framework reflect the needs of customers generally and align with Ofgem’s consumer interest framework by²³: <ul style="list-style-type: none"> ○ Delivering fair prices for consumers; ○ Supporting a low-cost transition to net zero; ○ Providing quality and standards so that all connections customers receive good service that meets their needs; and ○ Being attractive for long-term investment, supporting competition between generation projects (including for Contracts for Difference and Capacity Market contracts), and supporting reliable supply for consumers.
<p>2</p> <p><i>Reforms accelerate progress towards net zero</i></p>	<ul style="list-style-type: none"> • Electricity connection arrangements facilitate timely progress toward a fully decarbonised power system by 2035, in line with government targets by enabling more access to low carbon technologies and increasing flexibility. • Reforms should also facilitate maintaining a secure, resilient net zero system, via timely connection of generation and storage capacity.
<p>3</p> <p><i>Reforms begin to deliver as soon as possible, with impacts seen by 2025</i></p>	<ul style="list-style-type: none"> • Connections reforms make clear progress between now and 2025, delivering rapid, early improvements for connection customers. • Further reforms progress as needed to deliver considerable impact on development timelines to 2035 and 2050, in line with government net zero targets. • Reforms are <u>not</u> automatically ruled out if they cannot deliver by 2025. Improvements that will come later than this timeframe may also be considered, provided they do not compromise the necessary progress in the short to medium-term.
<p>4</p> <p><i>Reforms support improved coordination across the onshore and offshore networks on the transmission and distribution grids</i></p>	<ul style="list-style-type: none"> • Reforms seek to support consistent outcomes across the Transmission and Distribution networks, both onshore and offshore, with aligned and well-integrated approaches to the application process for all connectees. • Electricity connections arrangements take a whole system approach by facilitating interactions with other markets, including natural gas, and future markets for hydrogen and Carbon Capture and Storage.
<p>5</p> <p><i>Connections reforms are resilient to wider reforms</i></p>	<ul style="list-style-type: none"> • The connections framework should be future-proofed and work effectively with reformed market, system planning, charging and institutional arrangements. • Connections reforms should consider alignment with relevant wider reform programmes (eg REMA, FSO, local energy institutions and governance, and future systems and network regulation), their overarching policy objectives and strategic priorities, to the extent necessary without unduly delaying implementation. • For clarity, this does not mean waiting on the outcomes of these reforms, but balancing benefits with any risks of misalignment and considering adaptability of new arrangements.

²³ [Ofgem’s Forward Work Programme](#) - Consumer interest framework (Page 8).

Annex B: Illustrative reform stages and options for consideration

Near term improvements

As noted above, we welcome the work already being led by industry to improve the connections process in the near term under the ESO’s 5-point plan²⁴ and the SCG’s 3 step plan²⁵, summarised in the table below. **Table 2** sets out the initiatives, structured into three themes – queue management, storage and coordination:

Table 2 - Summary of the ESO's 5-point plan and the SCG's 3 step plan, structured by themes

Theme	ESO 5-point plan	ENA Strategic Connections Group 3 step plan
Queue Management	TEC Amnesty: allowing projects to exit the transmission entry capacity queue without penalty.	Queue management: promoting mature projects closer to delivery above those that could be ‘blocking’ the queue.
	Queue management: developing new contractual terms to manage the queue more efficiently, whereby projects which do not meet milestones are removed.	
	Improved background modelling assumptions: improve background Construction Planning Assumptions (CPAs), updated with current connection rates, and reducing the assumption that all projects in the queue will connect.	
Storage	Modelling of storage: altering how it is treated on the network, allowing it to connect faster and increase network capacity for other projects.	Storage: Greater flexibility for storage customers through new contractual options, in order to alter how it is treated on the network to facilitate faster connections and increase capacity for other projects.
	Interim offer for BESS: to offer an interim, non-firm connection option for Battery Energy Storage System to connect sooner, albeit with the potential of being switched off when the system is under stress, without initially being paid to do so.	
Coordination	<i>Links to developing thinking under the ESO’s Connections Reform Project.</i>	Coordination with transmission: changing how transmission and distribution networks coordinate and improve management of interactions.

²⁴ [Connections challenges: what are we doing now? | ESO \(nationalgrideso.com\).](#)

²⁵ [Energy networks launch action plan to accelerate grid connections – Energy Networks Association \(ENA\)](#)

It is crucial that rapid progress is made to improve offered connection dates, ensuring confidence for customers. The application of revised Construction Planning Assumptions to the modelling of system impacts on both new and existing connections will reduce the expected works required on the transmission system, thereby significantly improving connection dates for customers in the short-term.

Over 280GW of existing connection agreements will be re-modelled using these revised assumptions over the coming months. Through these changes and other elements of the 5-point plan, the ESO predicts that the majority of existing connection agreements will see improvements in connection dates of between 2-10 years, with reduced transmission reinforcement works in many cases. Improved dates for existing customers are expected to be communicated by March 2024 and offers for new applicants will also reflect this improved background.

The impacts on specific customer connection dates will vary depending on local constraints and the characteristics of other connections, but as an example: we would expect to see the most significant improvement in connection dates for smaller solar, wind and storage connections, currently impacted by significant reinforcement works on the transmission system. The greatest benefits are likely to be felt by customers with the longest wait times. Up to 95GW of energy storage projects will see further reductions in connection dates, as a result of the changes in the way that this technology is modelled and other initiatives under the ESO's 5-point plan, enabling them to come forward more quickly.

In addition, up to 8.2GW of generation projects holding transmission connection agreements are in the process of being removed from the connections queue following the TEC amnesty, which closed on 30th April 2023. Queue management improvements at both transmission and distribution will further accelerate the removal of projects that are not meeting progression milestones in their connection agreements and ensure that projects that are ready to connect can be moved forward in the queue. For distribution, this approach could impact up to 7.2GW capacity. At transmission, queue management could also have a material impact, depending on the implementation approach. Code modification proposal CMP376, relating to queue management, will be issued to Ofgem for decision in June.²⁶

Illustrative stages of reform

While we expect significant improvements to be delivered in the near term, we share stakeholders' concerns that these targeted initiatives will not go far enough and further

²⁶ [CMP376: Inclusion of Queue Management process within the CUSC | ESO \(nationalgrideso.com\)](#).

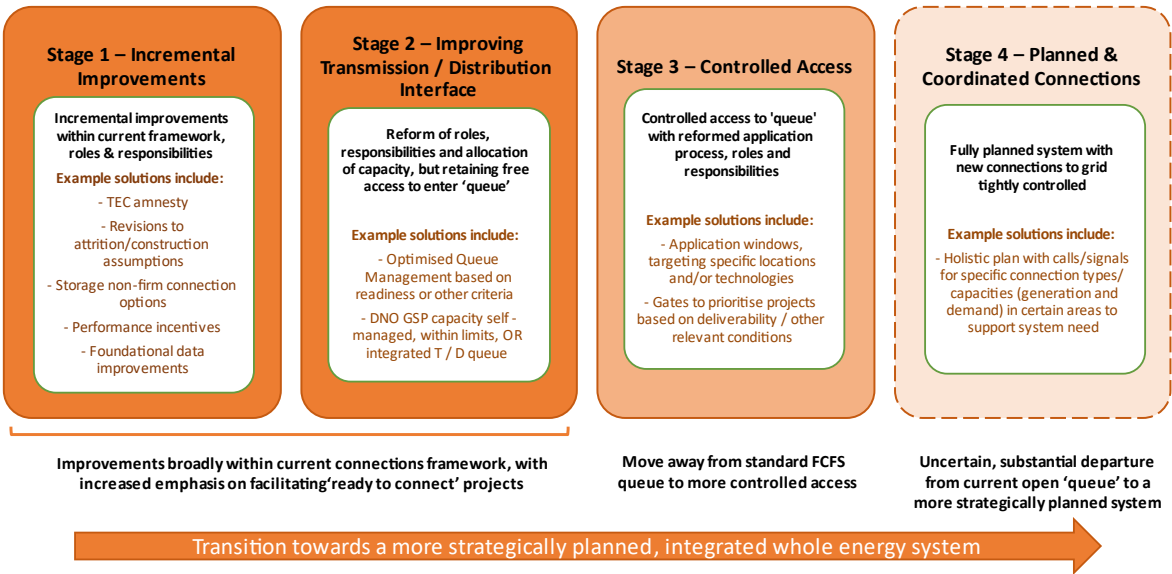
reform is needed. We are therefore considering a range of wider reforms to the way in which grid capacity might need to be allocated in the future, building on the work underway across industry (notably through the ESO’s Connections Reform project) and developing thinking under the ENA’s Strategic Connections Group.


We are encouraged by and supportive of the ESO’s upcoming consultation on options for further reform, expected to be published in June. We expect this to help enable long-lasting change at pace and identify what reforms should look like, as well as proposing approaches to their implementation. We will continue to provide strategic and regulatory leadership in this process to ensure reform projects complement one another and drive sufficient progress.


There are a range of potential solutions, likely to be progressed through a series of incremental stages that move the industry progressively towards a more fit for the future connections framework. This will be better suited to managing the volume and complexity of connections being seen today, and overall aligned better with the more holistic and strategic approaches to whole system planning we are moving to adopt. Illustrative stages of the reform are shown in **Figure 2**. We also describe these stages in further detail below. We expect to review and adapt them as needed in response to feedback, both direct and in response to the ESO’s upcoming consultation, and as our thinking evolves.


The extent to which we move towards stages 3 and (if at all) 4 will depend on the effectiveness of the earlier stages in meeting the outcomes. We are prepared to drive reforms as far as is necessary to achieve our objective and desired outcomes.

Figure 2 – Illustrative stages of reform as the system transitions towards a more strategically planned, integrated whole energy system



 **Stage 1: Incremental improvements** are underway within the current framework. Led by industry – including the ESO’s 5-point project and the ENA’s 3-point plan – these will bring forward improvements to various aspects of application and queue management processes, as well as network impact modelling assumptions. This should build on foundational improvements to pre-application data and processes across the system (such as network heat maps) which could become more standardised, transparent and dynamic. A more proactive approach to queue management – with an ability to remove projects which are not progressing from the queue and an emphasis on enabling projects which are ready to progress, while minimising impact on other parties – is an important feature. Industry may also explore ways to enable connectees to help offer or shape solutions, for example through flexible connections or connections which otherwise reduce the overall grid impact in an area. While the precise approach to queue management might change in later steps, much of this foundation is likely to endure.

 **Stage 2: Improving transmission/distribution interface** builds on Stage 1 by improving coordination across the interface between the transmission and distribution networks, with the potential for adaptation of certain roles and responsibilities in managing connections with impacts across the boundary. This is becoming increasingly important with constraints at Grid Supply Points (GSPs), meaning that a greater number of distribution connections have impacts on transmission. Solutions are being considered that would simplify and streamline these interactions, create greater consistency, reduce friction and improve connection timescales across system boundaries. Additionally, reforms in this stage could see queue management evolve more substantially, whilst remaining broadly within the current framework. This would see them going further to make fullest use of available capacity, eg based on customers’ readiness to connect.

 **Stage 3: Controlled access** considers a more fundamental move away from the current queue-based application process, introducing the concept of controlled access – either through application windows or with the introduction of stricter qualification gates. Applications within these windows could be managed under different approaches, from FCFS to other approaches to prioritisation (including scope for customers to play a greater role) with potential trading or auction-like mechanisms. This would require more fundamental changes to roles and responsibilities of the parties involved and to existing processes. This stage and the next (Stage 4) also rely to a significant extent on the ability to visualise and analyse the contracted background (including demand)²⁷ as a set of interactive projects with

²⁷ Defined as all contracted projects both connected and future.

specific locational characteristics, rather than a linear queue. This may better reflect the realities of planning processes and interdependencies.



Stage 4: Planned & coordinated connections builds on the concept of controlled access by considering a longer-term future network that is substantially planned and co-ordinated, with specific connection types or capacities incentivised or procured in certain areas to support system needs. This longer-term approach is highly uncertain and would strongly depend on wider and as yet uncertain reforms to the energy market and future system planning. These links would need to be carefully considered, including the suitability of such approaches for different connection types and sizes.

We recognise that these stages represent a spectrum of possible changes and that there may be models which fall between them or even combine them. We welcome comments from stakeholders on whether these stages resonate, whether and how they see these 'steps' progressing, and what would steer us towards certain packages of reforms. We are also interested in feedback on the extent to which different arrangements may be more appropriate for different parts of the system or on different timeframes.

Annex C: Key dependencies and longer-term outlook

Future connection arrangements will need to be compatible with the outcomes of wider reform programmes, including REMA, the Access SCR, the introduction of the FSO and approaches to strategic planning. We will consider these reform programmes when shaping views on near-term reforms to connections, while also ensuring the development of enduring and fit-for-purpose arrangements in the long-term.

The current focus for REMA is how locational signals can best be improved to deliver effective signals in operational and investment timescales to drive down the costs of energy for consumers in the long run. Once there is greater certainty on longer-term planning arrangements and market direction, the exact model for connections and access can be developed. This may include signals to customers on where to connect.

A number of initiatives, such as the introduction of a Centralised Strategic Network Plan (CSNP) under the FSO and potential Regional System Planners (RSPs), are underway to embed strategic planning processes within the framework of future system and network regulation. These will enable the connection of significant quantities of generation and demand. Future connection approaches are likely to evolve to integrate with a strategic system planning approach. Connecting customers will likely need to engage with system-wide and any more localised network plans, to optimise their location and the type of connection. Further policy development will confirm the full range of FSO capabilities and the regional system planners RSPs design features.

The recently implemented Access SCR will shape the potential use of non-firm connections products and reduce costs of connection for many connecting customers at distribution where their connections require reinforcement. It will also better support the DNOs in taking a more strategic approach to planning and investing for connections in future.²⁸

Additionally, government is taking forward work on important enablers in relation to planning and land rights. The enablers aim to ensure that electricity infrastructure can be built without undue delay through planning process improvements. The next steps include guidance on the benefits that communities receive from hosting transmission network infrastructure and the development of alternative dispute resolution processes should landowners disagree with the compensation offered by network operator when land or rights to access land are acquired. The government also plans on publishing a response to

²⁸ [Access SCR - Final Decision \(ofgem.gov.uk\)](https://www.ofgem.gov.uk)

stakeholder views on whether the land rights and consents process enable the transformative change required.²⁹

We will continue to monitor and engage with these programmes to ensure that the options for enduring connections arrangements align with the broader principles of wider market reform, considering government priorities. This may include considering aspects beyond the scope of thinking in the nearer term (focused on connections processes) such as more fundamental changes to signals and access allocation arrangements.

²⁹ HM Government, Powering up Britain – Energy Security Plan, March 2023, p.48.

Annex D: Support for Distribution Queue Optimisation

Queue optimisation refers to the prioritisation of projects that are progressing as planned, have met their progression milestones and are ready to connect to the distribution network – ahead of projects that are delayed and have not met their milestones.

Whilst most distribution connection agreements signed after 2017 contain milestones, this is not the case for older connection agreements. Furthermore, these older connection agreements generally relate to projects that are delayed. Without milestones, these older, delayed projects, occupy a place in the DNOs' connection queues and prevent other projects – that also have connection agreements – from being able to connect to the distribution network.

Ofgem, therefore, supports the principle of DNOs introducing progression milestones into older connection agreements to facilitate the more active management of distribution connection queues. Any such changes to connection agreements should be agreed through bilateral discussions between the contracting parties, under the terms of these existing connection agreements.

Ofgem also supports the principle of DNOs optimising the capacity headroom in distribution connection queues by actively accelerating projects that are ready to connect, ahead of projects that have failed to achieve their progression milestones and/or that are unable to connect currently due to the amount of capacity available.³⁰ It is important that there is a consistent approach to determining which projects are ready to connect, and DNOs should work closely with each other, the TOs and ESO to agree relevant definitions.

Any such advancement should occur only where the distribution network can connect a project that is being advanced without undue delay to other connecting parties and where the project can be connected without the need for reinforcement works – at either distribution or transmission level. Any advancement of projects under this queue optimisation process shall be in accordance with the terms of existing connection agreements and should not be to the detriment of any party that has met the terms of their connection agreement, including achieving their progression milestones.

³⁰ The action by the DNOs to connect smaller capacity connections would not be to the detriment of the larger customer, who would retain their connection date subject to meeting their milestones. This means that the headroom is not sterilised by the larger connection in the meantime.