Impact Assessment

TMO4+ Impact Assessment

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We[1] are consulting on our minded-to decisions to approve the Target Model Option 4 + (**TMO4+**) package of reforms to the connections process. The TMO4+ reform package[2] includes the code modifications CMP434, CMP435, CM095, and three methodologies: Gate 2 Methodology, Connections Network Design Methodology, and Project Designation Methodology. We are also consulting on proposed changes to licences to enable the TMO4+ reform package to be implemented. The TMO4+ reform package is a new proposed connections process that would apply readiness and strategic alignment criteria to the existing connections queue, and to future applicants. It would also introduce a new batched application and offer process.

This document summarises the impacts of TMO4+ in accordance with our duties under Section 5A of the Utilities Act 2000. It outlines the problem under consideration, the rationale for intervention, the options considered, and an evaluation of the proposed solution compared with the status quo.

1 References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.

2 "TMO4+" and "TMO4+ reform package" are used interchangeably throughout this document and refers to the entire package, including the code modifications CMP434, CMP435, CM095, and the three methodologies: Gate 2 Methodology, Connections Network Design Methodology, and Project Designation Methodology.

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1. Introduction

Section summary

This section examines the current connection process to define the problems it currently gives rise to and how they present a rationale for the proposed intervention, and from this, sets out the scope of this Impact Assessment.

Problem Under Consideration

1.1. The current connections process operates on a first come first served basis, where users that apply to connect to the electricity system (either the high-voltage transmission system or the distribution system), are prioritised based the date their offer is accepted.

1.2. In November 2023, Ofgem and DESNZ published our joint Connections Action Plan (**CAP**)[3]. This set out a framework of actions and further ambitions needed to tackle the growing delays customers are experiencing when seeking network connections.

1.3. The background to the proposed TMO4+ connections process is set out in the document, 'Consultation: TMO4+ Connections Reform Proposals - Code Modifications, Methodologies & Impact Assessment'.

1.4. The current connections process is presenting the following four problems. Each is considered in more detail below.

- **Unrealistic connections queue**: The connections queue has grown at pace. Across transmission and distribution, 233GW of new connection applications were made in the 2019/20 financial year, compared to 445GW of new connection applications made in the 2023/24 financial year. The queue now contains far more generation capacity than required to achieve Clean Power by 2030 and net zero and contains projects that are not progressing to connection. The size of the queue and the current process means that non-progressing projects are preventing viable, needed projects from being able to progress, and new ready projects cannot connect in a timely manner.

[3] Connections Action Plan: Speeding up connections to the electricity network across Great Britain

- **Queue misaligned with Clean Power and Net Zero**: If, albeit unlikely, the full queue met readiness criteria, all technologies would have more capacity in the queue than is required by 2035 in the CP2030 Action Plan (although low-carbon dispatchable power would be under-supplied for the 2030 period). If the readiness criteria were only satisfied by those projects identified as such in the NESO'S Request For Information (**RFI**), there would be an undersupply of onshore wind, offshore wind, and low carbon dispatchable generation.
- Easier to develop technologies, such as batteries and solar, are significantly oversupplied and exceeding the capacities in the CP2030 Action Plan and these projects hold network capacity and queue positions. The consequence is that the current process appears to block under-supplied technologies from connecting in time and does not allow the acceleration of key technologies if specific gaps emerge (for example, because a specific project drops out or a specific security need is identified). There is, moreover, a broader risk that the connections needed for 2030 and beyond cannot be delivered at the desired rate, due to the impact of the current queue on network build, putting secure Clean Power by 2030 at risk.
- **Unclear network build signal**: The long connections queue is driving the need for significant new network to be planned (and consequently receiving connection dates in the late 2030s and early 2040s). Under the current process network companies must plan for these connection works, even if misaligned with what they are planning for the wider network. If this rate of build were achieved, the costs would be material and have a high risk of being materially inefficient. In practice, networks recognise this risk, but as a consequence, both the queue size and misalignment with decarbonisation targets is creating considerable uncertainty for networks over what to build. This is resulting in a growing disconnect between contracted capacity and wider network build plans. The current rate of connections to the network is far lower than the rate of growth of the queue, and there is considerable investor uncertainty over whether their connections dates would be delivered by network companies. In our view, it is likely unrealistic that networks could connect all the projects currently contracted to connect by their connection date.
- **Reduced investor confidence**: New generation and storage are receiving offers well into the late 2030s and 2040, pushing any possible investment years into the future. Existing connection offers are closer in time, however

there is a risk that these offers are based on unrealistic network plans and are based on a rate of network delivery far above the current connections rate. Furthermore, NESO and network companies have the contractual abilities to change connections dates. All of these issues undermine confidence in connection agreements and ultimately investment. Directly connected transmission demand, representing key energy consumers and in some cases key contributions to economic growth, face similar delays and risks in gaining access to the network, which in some cases deters investment in expansion of existing or brand-new industrial sites.

1.5. The overall result of this status quo connections approach is long connection dates for all new projects including necessary generation/storage technologies or important demand, and insufficient number of projects connected annually due to unclear signals on what network is genuinely required to accelerate connections. The current connection rate is 3-4 times slower than the rate needed to connect the CP2030 Action Plan pathways. The current process is not one that will credibly achieve efficient and secure Clean Power by 2030, and materially risks acting as a handbrake on economic growth.

Unrealistic connections queue

1.6. As of December 2024, there was 753GW worth of projects holding a connection contract across the transmission and distribution network - 578GW at transmission and 175GW on the distribution network[4]. This far exceeds what is estimated to be needed for GB to achieve Clean Power in 2030[5] or to be on track for net zero by 2050[6].

1.7. As shown in Figure 1 below, the volume of new connection applications (including new applications and modification applications) to the network received by the NESO and distribution networks has increased significantly over the last five years. Across transmission and distribution, 233GW of new connection applications were made in the 2019/20 financial year, compared to 445GW of new connection applications made in the 2023/24 financial year.

[4] Connections Data – Energy Networks Association (ENA).

[5] Clean Power 2030 Action Plan - GOV.UK.

[6] Future Energy Scenarios (FES) | National Energy System Operator.

Figure 1: Capacity of total new connection applications received each financial year (GW)

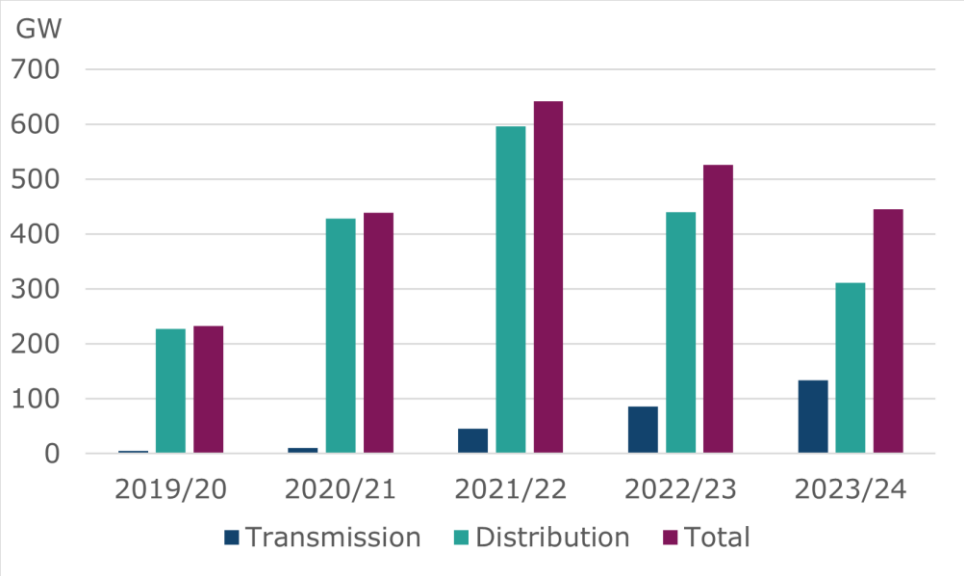


Table 1: Capacity of total new connection applications received each financial year (GW)

	2019/20	**2020/21**	**2021/22**	**2022/23**
Transmission	5.27	10.36	45.26	86.07
Distribution	227.68	428.55	596.10	439.30
Total	232.95	438.90	641.37	525.37

1.8. Comparing the 2023/24 financial year to the 2019/2020 financial year, the total number of new connections applications received increased by 91%. Comparing only the number of new transmission connection applications received in 2023/24 to 2019/20 shows an increase of 312%.

1.9. Modification Applications (i.e. applications to vary connection contracts) have made up an increasingly significant proportion of connection applications to the transmission network (33% in 2023/24). Figure 2 below shows a breakdown of the different types of NESO applications received each year, including modification applications.

Figure 2: All applications received for Transmission-level connections each financial year (count)

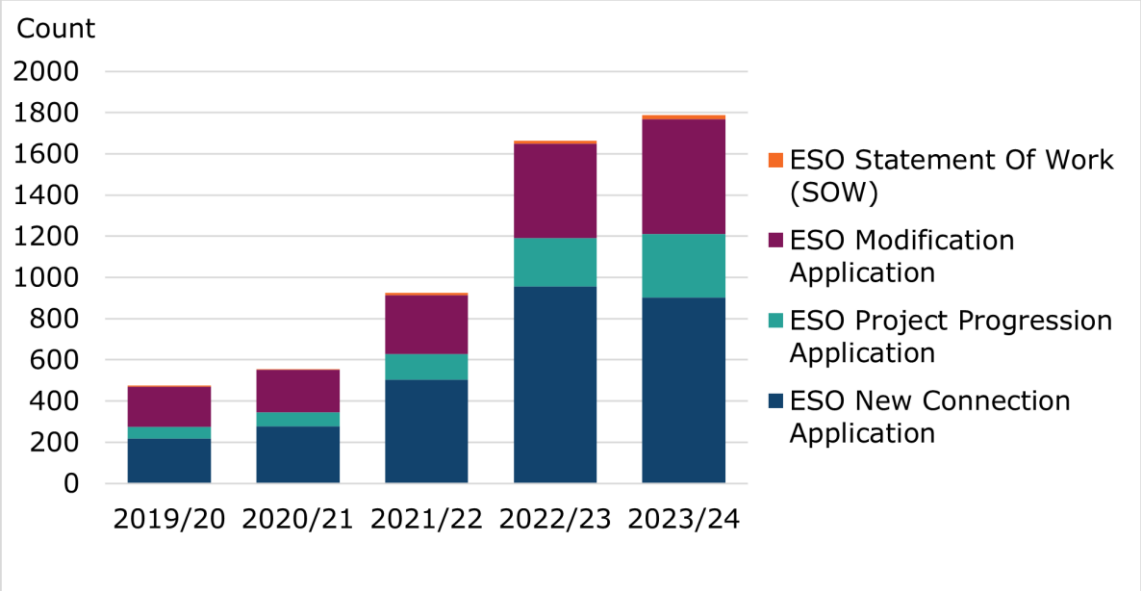


Table 2: All applications received for Transmission-level connections each financial year (count)

Application Type	**2019/20**	**2020/21**	**2021/22**	**2022/23**	**2023/24**
ESO New Connection Application	219	278	505	955	902
ESO Project Progression Application	56	66	123	237	309
ESO Modification Application	195	207	286	458	557
ESO Statement of Work (SOW)	6	3	10	13	20
Totals	476	554	924	1663	1788

1.10. There is evidence of frequent use of modification applications once a queue position has been secured. Modification applications could be made for a number of reasons, including but not limited to, changing technology types, import / export capacity, and connection dates.

1.11. A high volume of modifications suggests that connecting parties are changing their plans for exactly what they are going to connect and when. However, by modifying their application, they are holding their position in the queue in front of other projects. Figure 3 below shows the number of modifications applications that are associated with all Transmission Connections agreements in the current queue, where a number greater than 1 indicates that a single connection agreement has been modified multiple times.

Figure 3: Number of modifications applications associated with all Transmission Connections agreements in the current queue

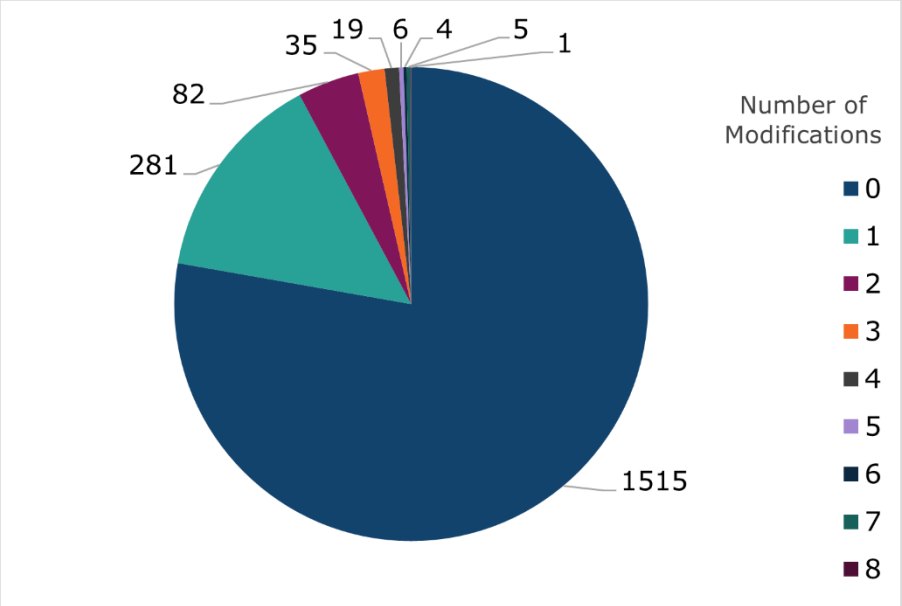


Table 3: Number of modifications applications associated with all Transmission Connections agreements in the current queue

Number of Mod Apps	0	1	2	3	4	5	6	7	8
Project Count	1515	281	82	35	19	6	4	5	1

1.12. In 2022, industry and Ofgem recognised a clear concern that underdeveloped projects were entering the queue, and projects that were ready to connect but had a connection date in the far future were potentially being blocked from connecting by projects that were holding capacity in the queue and not progressing. NESO (then ESO) published the Case for Change for GB

Connections Reform in December 2022[7]. However, the number of applications at Transmission continued to increase year on year, despite efforts to improve the connections process.

1.13. The response to this was the introduction of queue milestones via CMP376, which intended to address some of the problems caused by speculative and slow-to-progress projects by introducing Queue Management Milestones, which if not met by the connecting customer by a prescribed deadline, could result in the termination of their connection agreement. Since the implementation of CMP376, if projects make a Modification Application, they are required to maintain their existing Queue Management Milestones[8], disincentivising the seeking of a later connection date.

1.14. In May 2024, prior to the deadline where Queue Management Milestones would take effect, there was a spike in modification applications (167) compared with the 24/25 year to date monthly average (72). We expect the reason for this spike to be that many projects modified their agreements to avoid having Queue Management Milestone dates placed into their agreements, which they would have been unable to meet, and which would have resulted in the termination of their connection agreement. This mitigated the impact on parties in the queue but lessened the intended impact of CMP376.

1.15. Figure 4 below shows the capacity of transmission projects in the queue which will be due to meet the M3 Queue Management Milestone ('Land Rights') each year (being the first Milestone projects are required to meet), thus creating the possibility of contract termination by NESO in cases where Milestones are missed.

[7] GB Connections Reform Case for Change.

[8] NESO does have discretion to amend Queue Management Milestone dates to accommodate for exceptions issues see CUSC Section 16 Paragraph 16.5

Figure 4: Total Transmission capacity of projects reaching an M3 Queue Management Milestone each year (GW)

Table 4: Total Transmission capacity of projects reaching an M3 Queue Management Milestone each year (GW) (Source: NESO Monthly Databook December 2024)

Year	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
M3 Secure Land Rights	28.07	112.53	77.18	69.94	43.44	70.08	77.36	69.25	46.58	106.35	20.2	1.04	3.85

1.16. This indicates that the majority of the queue are still many years from reaching their first Milestone, with other (more onerous) Milestones falling later still. The consequence of this is that it is likely to be several years before Queue Management Milestones result in contract terminations for speculative, non-viable or slow to progress projects. In the meantime, these projects remain in the queue, which means that they continue to contribute to the three problems set out below: uncertainty for network companies in regard to which projects are progressing which affects network build, and projects blocking ready projects from progressing which risks achieving Clean Power by 2030 and risks investment across generation and demand.

1.17. Even once Queue Management Milestones start to occur, the rate of potential terminations is unlikely to outstrip the annual rate of connection applications.

This means that the queue will continue to grow and indicates that further intervention building on Milestones will be needed. For example, 113GW of projects are required to meet the M3 Milestone in 2025, compared to 445GW of projects who joined the queue in 2023/24.

Misalignment of queue with Clean Power

1.18. Government's CP2030 Action Plan[9] estimates that between 204GW and 231GW of generation, storage, interconnectors and flexibility will be needed to achieve Clean Power by 2030 and up to 318GW will be needed by 2035 to be on track to deliver net zero by 2050.[10] Across all delivery of Clean Power, we, and Government, recognise the paramount importance of finding the most cost-efficient route possible to protect the interests of consumers.

1.19. Considering the current grid has 119GW[11] of connected capacity, we are unlikely to need the majority of the capacity in the current queue to achieve Clean Power by 2030 or need it to be on track to deliver net zero by 2050[12].

1.20. Figure 5 below shows the current queue for generation projects with connection dates in 2030 or earlier, compared to the maximum of the 2030 capacity ranges in CP2030 Action Plan, demonstrating that there is sufficient supply of projects to meet Clean Power by 2030. For all technologies excluding low carbon dispatchable power. However, for batteries and solar, there is a significant oversupply.

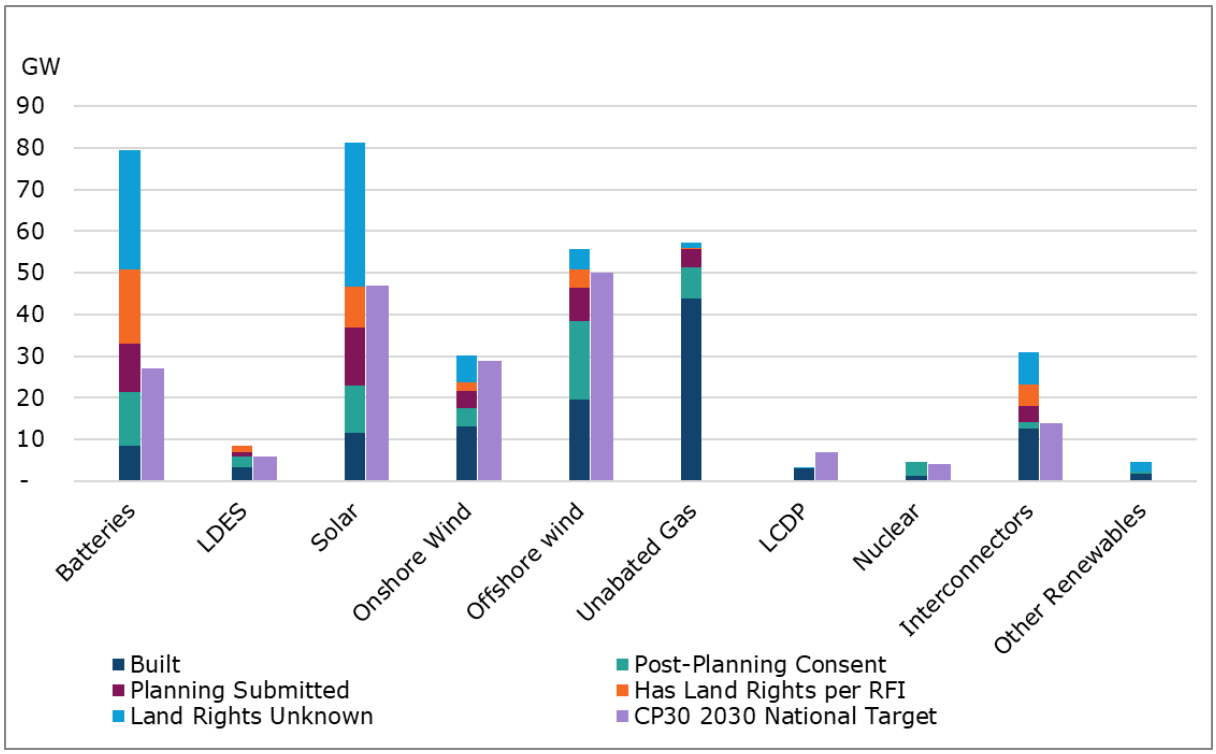
[9] Clean Power 2030: Action Plan: A new era of clean electricity.

[10] Clean Power 2030 Action Plan. Connections reform annex, Table 1.

[11] NESO TEC register and DNO provided data. (Assumed TEC register capacity with connection date pre-2025 is connected).

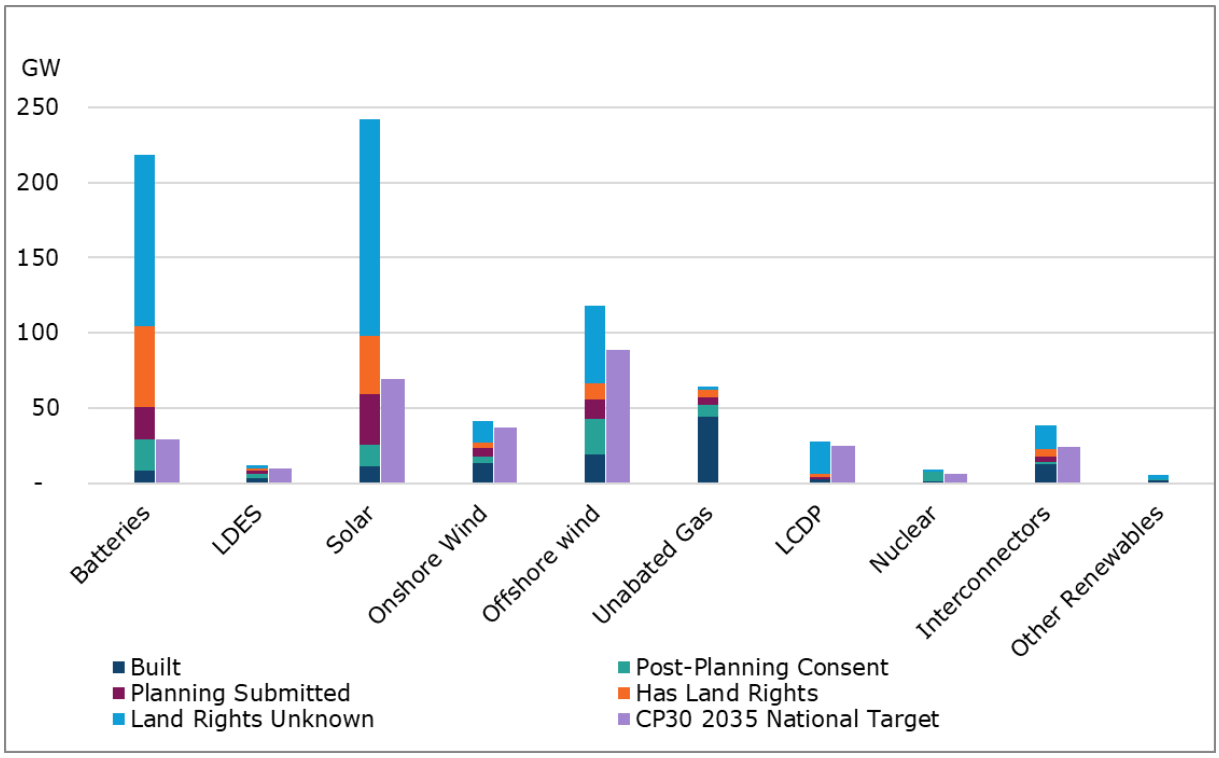
[12] FES 2024 Holistic Transition combined generation and storage capacity of 381GW.

Figure 5: Capacity of the Full Queue compared to the maximum capacity for 2030 as needed in Clean Power 2030 Action Plan



1.21. Figure 6 below shows the current queue out to 2035, compared to the maximum of the 2035 capacity ranges. This shows demonstrably significant over-supply for batteries and solar with many of these projects not expected to be progressed, and some oversupply of offshore wind.

Figure 6: Capacity of the Full Queue compared to the maximum capacity for 2035 as needed in Clean Power 2030 Action Plan



1.22. However, whether there is sufficient generation of all types in the queue for 2035 materially changes if not all projects in the queue are ready, and ready projects do not align with CP2030 Action Plan regional and zonal capacities. Different, and at least equally credible assumptions on readiness suggest there may be shortfalls in several key technologies unless new or different projects can be advanced.

1.23. The current process for entering the queue gives no consideration to what technology mix is needed, nor does the current process provide a mechanism for the connection queue to be reprioritised or amended with regards to technology composition. As set out in the section above, even after the recent CMP376 reforms, material volumes of projects can continue to hold queue positions and network capacity for the coming years.

1.24. The CP2030 Action Plan provides a clear view of the types of projects that are likely to be needed for 2030 and 2035, and the data above demonstrates that some needed technologies are already at high risk of being blocked.

Unclear network build signal

1.25. The NESO and Network Companies are required to assess the impact of every connection application on the network. To facilitate the current size of the

connections queue, a significant expansion of the electricity system is needed. While network reinforcement will be needed to deliver the CP2030 Action Plan and net zero, the connections queue does not match the volume or mix of capacities that are needed to 2035 in the CP2030 Action Plan. This mismatch creates uncertainty which is compounded by historic attrition rates (ie the percentage of projects that hold a connection agreement, but the subsequently do not connect). In 2022, NESO analysed 9 years' worth of TEC register data, estimating that between 30-40% of projects who accepted offers would actually connect.[13]

1.26. Networks companies must currently plan to deliver a network that matches the connections queue, while faced with clear evidence that the queue is likely significantly larger and is potentially different in terms of the technology mix, than what is needed. The NESO and Network Companies are therefore faced with the challenging position of determining the network build to deliver based on assumptions on which connections will ultimately deliver, leading to likely inefficient use of network resources.

1.27. The rate of total (distribution and transmission) new connection applications and offer acceptances (average of 134GW of total new connection offer acceptances per year since 2019) is far more than the capacity being connected (average of 8GW per year since 2019) or terminated. As a result, the queue has been growing by rates of up to 126GW a month.

[13] 1.2.2. Page 4 Connections Reform Final Recommendations Report Dec 2023.

Figure 7: Capacity of Transmission connection offers that are accepted vs connected each financial year (GW)

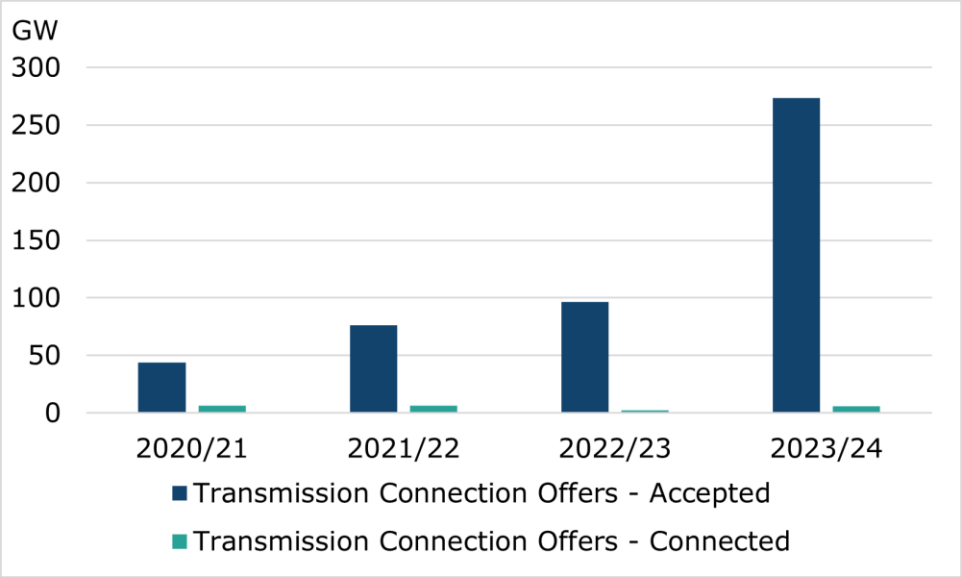


Table 5: Capacity of Transmission connection offers that are accepted vs connected each financial year (GW)

	2020/21	2021/22	2022/23	2023/24
Transmission New Connection Offers - Accepted	43.99	76.34	96.49	273.70
Transmission Connection Offers - Connected	6.21	6.09	2.35	6.03

Figure 8: Capacity of Distribution connection offers that are accepted vs connected each financial year (GW)

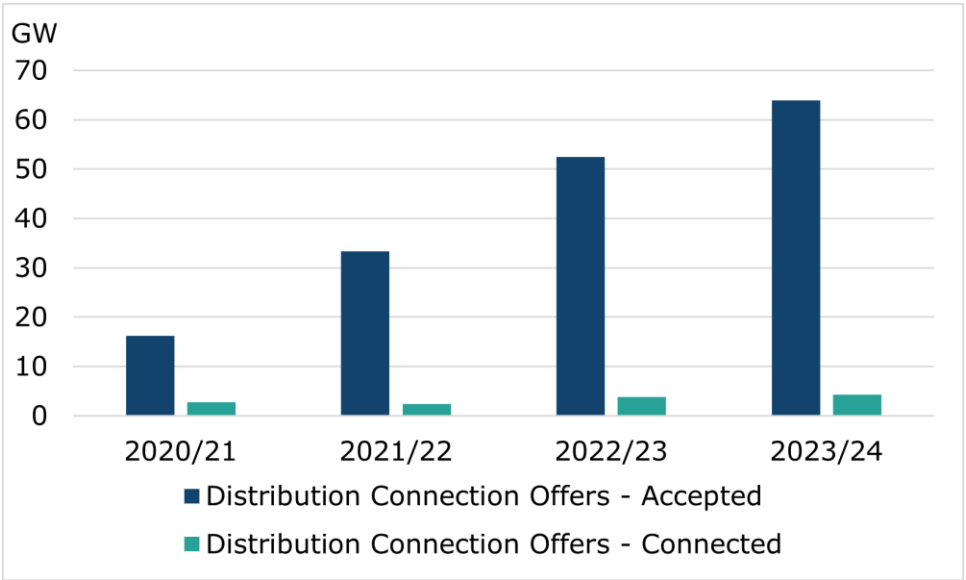


Table 6: Capacity of Distribution connection offers that are accepted vs connected each financial year (GW)

	2020/21	2021/22	2022/23	2023/24
Distribution Connection Offers - Accepted	16.20	33.38	52.44	63.92
Distribution Connection Offers - Connected	2.76	2.44	3.83	4.29

1.28. The increase in demand for connection offers and the current length of time needed to build the network and connect projects has resulted in users being offered connection dates many years into the future. Although there are many contributory factors to the current time to build network, the size of the current connections queue contributes to the uncertainty in required network build and therefore contributes to delays. This is because we know anecdotally network companies, both distribution and transmission, wait for users to demonstrate progress to completion before moving ahead with significant investment in the network.

1.29. As of December 2024, over half of generation customers currently in the transmission queue that are holding connection agreements have a connection date at least 5 years in the future, with over 25% receiving connection dates beyond 2032, some in the 2040s. Figure below shows the number of years, on average, that projects in the transmission queue are waiting until their respective connection dates.

Figure 9: Capacity of projects in Transmission queue by the number of years until their connection dates (GW)

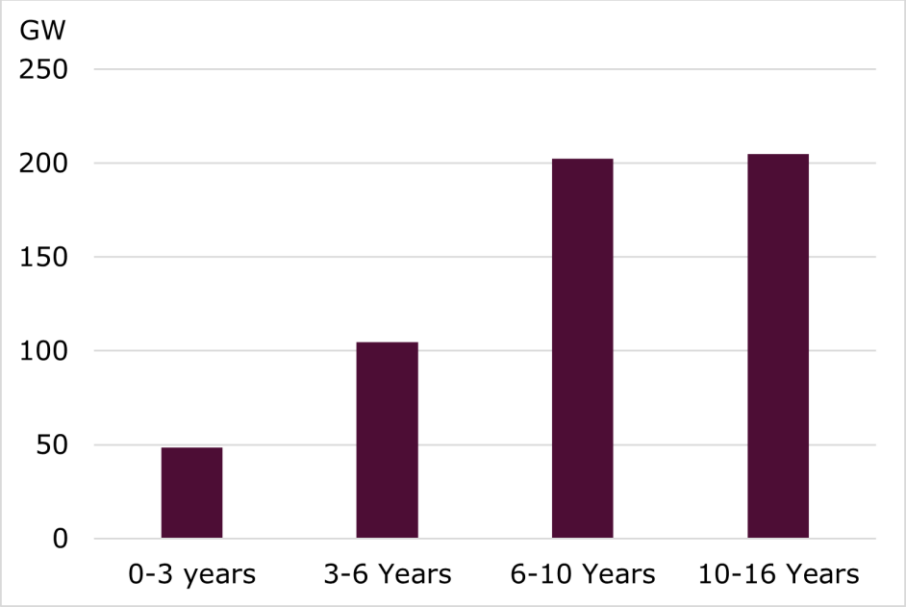


Table 7: Capacity of projects in Transmission queue by the number of years until their connection dates (GW)

Years	**0-3 years**	**3-6 Years**	**6-10 Years**	**10-16 Years**
Capacity in GW	48.64	104.62	202.44	204.82

1.30. 70% of distribution connections are reliant upon transmission reinforcement (or are pending analysis by NESO). Many of these projects are able and willing to connect sooner, but the connection dates for many of these projects are driven by the time taken for transmission reinforcement, which take in to account the reinforcements required for other transmission connected assets.

1.31. Both connecting parties and networks are responding to this situation as best as they can under the current process, but the result is that the scale of the problem and the lack of certainty - on both sides – is worsening, which makes rapid, efficient, reliable connections even harder to deliver.

1.32. Connecting parties see the delays to connection dates, as a result of requiring significant grid reinforcements. Developers of renewable generation and storage seek connection agreements as early as possible in their development process to try to secure a grid connection with a reasonable connection date, which may not ultimately connect. and may then ask to amend their offer or eventually drop out. Connection dates in contracts offered by network companies are necessarily informed by uncertainty in the current connections pipeline and the incentive to give connection customers dates close to their requested connection date. Network companies can push-back the connection dates in customers' contracts via an agreement to vary. Figure 10 below shows the number of projects in the queue that have been impacted by a network agreement to vary (note not all of these ATVs will be due to a change in connection date).

Figure 10: Number of Signed Agreements to Vary associated with all Transmission Connections agreements in the current queue

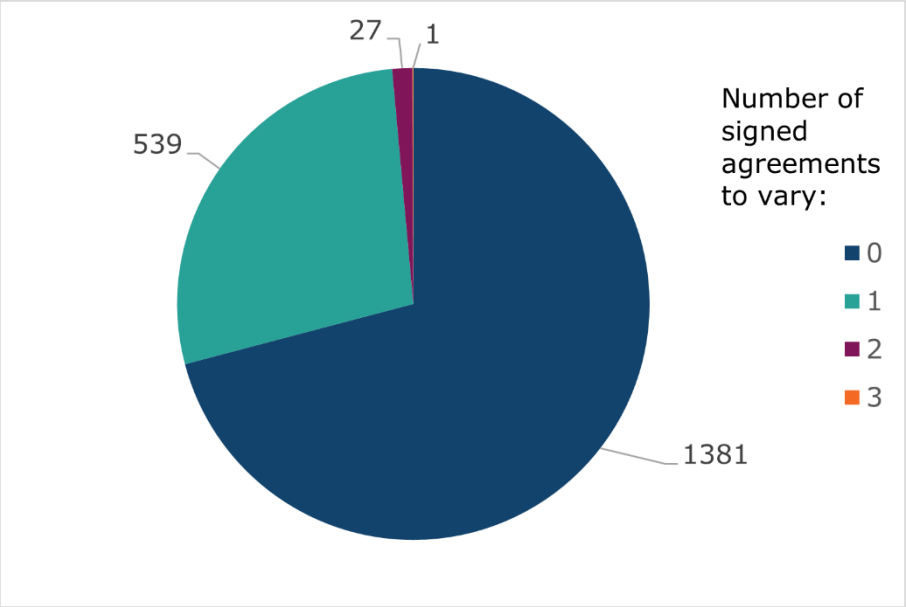


Table 8: Number of Signed Agreements to Vary associated with all Transmission Connections agreements in the current queue

Number of Signed Agreements to Vary	0	1	2	3
Project Count	1381	539	27	1

1.33. The behaviours driven by the current connections process and regulatory regime for the network has led to inefficiency in network planning with network companies being uncertain about what network reinforcements are needed. At the same time, the dates in connection contracts are being subject to change due to highly challenging assumptions on the actual network build, which in turn increases investor uncertainty.

1.34. The current process creates a detrimental disconnect between the contracted capacity in the connections queue and the reality of connections and network build. Based on current figures, at transmission alone, NESO and network companies have issued connection offers with connections dates 2030 and earlier to over 213GW of generation capacity[14]. To deliver these connection dates,

[14] NESO Connection Reform Data Impact Assessment Part B, F.39. Queue to 2030 less built capacity

Transmission Operators (TOs) would have to connect users at a rate of 42.6GW per year, approximately 10 times the 5-year historical average for transmission connections. At this historical rate, it would take TOs circa 48 years to connect all the pre-2030 capacity currently contracted.

1.35. The CP2030 Action Plan shows it is unlikely that all these connections will be needed, and specifically that there is an extremely high risk that building all network implied by the current queue would be inefficient, unnecessary spend.

1.36. Nonetheless, the rate of connections to the network will need to increase significantly if GB is to deliver on the generation and storage capacity required to achieve Clean Power by 2030, to approximately 20GW[15] on average between 2025-2030 up from 8GW average between 2019-2024 across transmission and distribution[16]. Achieving this will require action in multiple areas, delivering increased network build through networks prices controls and tougher obligations ensuring the deliver[17]. The critical enabler for this will be the connections process in providing networks with a clear, credible pipeline of projects to connect.

1.37. A credible queue of prioritised projects will allow networks to efficiently prioritise, materially increasing their ability to connect at pace, increasing the credibility that they can connect the generation to achieve Clean Power by 2030. It will also materially increase transparent accountability of networks to achieve this.

Reduced Investor Confidence

1.38. Across all projects, the oversized queue size means that new projects – even if ready to connect – will join the back of the queue and cannot connect in good time. As set out above, many applicants now face connections dates in the late 2030s. This means there is a limited route for new projects, significantly delaying or deterring investment.

1.39. Projects within the queue are also experiencing uncertainty in whether their connection dates will be met, or whether their connection date may need to be changed due to changes in the timing of network reinforcements.

1.40. For generation and storage, this impacts across all projects but from the perspective of the consumer is most serious when it impacts a specific project

[15] 219GW capacity required for 2030 minus 119 GW built capacity, to be delivered over the next 5 years.

[16] ENA Monthly T&D data book January 2025

[17] TAAP, RIIO-T3 and Connections end-to-end review of the regulatory framework will contribute to speeding up of network delivery and connections

that would be materially more beneficial to the energy system (due to its technology and/or location) than projects already in the queue.

1.41. For demand, the consequences impact on energy users and economic growth. Access to the electricity networks is a key requirement for almost all major infrastructure projects, including generators, energy storage, and electricity consumers such as factories, data centres, hospitals, and housing developments.

1.42. For users seeking a demand (non-generation or export) connection to the transmission system, such as to invest in projects to drive decarbonisation or economic growth, for example industrial sites, data centres; delays to grid connections could divert investment entirely to other countries, having a negative impact on economic growth.

1.43. The Office for Investment is working with demand projects worth tens of billions of pounds which are citing access to the electricity grid as a necessity for their investment, meaning their investment plans are at risk where network access is delayed.

Rationale for intervention

1.44. Ofgem's principal objective is to protect the interests of both current and future consumers, which includes their interests in the Secretary of State's compliance with the duties in sections 1 and 4(1)(b) of the Climate Change Act 2008 (net zero target for 2050 and five-year carbon budgets)[18], and their interests in the security of the supply of electricity to them. In addition, Ofgem has an obligation to have regard to the desirability of promoting economic growth in exercising its functions.[19]

1.45. Ofgem oversees the regulatory regime for connections. Please see the 'Consultation: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment' document where we outline the actions that we have taken to date and why further intervention is now needed to the connection process address the problems set out in the previous section, namely:

- Unrealistic connections queue:
- Queue misaligned with Clean Power and Net Zero:
- Uncertainty for network build:
- Undermined investor confidence

[18] As set out in the Climate Change Act 2008.

[19] Deregulation Act 2015.

Scope of Impact Assessment

1.46. As set out above, the new connections process proposed by NESO, known as TMO4+, requires changes to industry codes (CMP434, CMP435, CM095), licences (NESO, Transmission, Distribution) and the introduction of new Methodology documents (Gate 2 Methodology, Connections Network Design Methodology, Project Designation Methodology). This Impact Assessment assesses all these regulatory changes together as a single package of reforms.

1.47. Ofgem is under a statutory duty to conduct an Impact Assessment when an important change is proposed[20]. This includes, but is not limited to, changes that have a significant impact on persons engaged in the generation, transmission, distribution or supply of electricity, or have a significant impact on the NESO carrying out its functions. We consider that this Impact Assessment, which we have carried out in line with our Impact Assessment Guidance[21], complies with these obligation by assessing the benefits, risks, and costs of implementing TMO4+ as well as comparing this with remaining with the status quo. Further, in accordance with our statutory duties, this Impact Assessment includes an assessment of the likely effects on the environment of implementing the proposal. See, in particular, the section on environmental Environmental impacts .

1.48. This Impact Assessment considers the likely impacts of reforms. It is quantified to the extent possible at this stage; necessarily limited due to the urgency, complexity and strategic importance of the proposals and the interdependency on other policies and reforms which will determine the final impacts. Uncertainty in the current status of projects in the queue and how individual projects will be impacted by reforms creates limitations in our analysis. Where we have made assumptions, we have stated where and what these are.

1.49. This Impact Assessment is informed by the published Impact Assessment carried out by NESO[22] as well as assessments produced by the Transmission Owners for Ofgem, consultation with DNOs, and responses to the NESO methodology consultation and our policy consultation on licence changes to enable TMO4+.

[20] Section 5A of the Utilities Act 2000.

[21] Impact assessment guidance | Ofgem

[22] https://www.neso.energy/industry-information/connections/connections-reform

1.50. To assess the impacts of the size and scope of the queue we have relied upon data provided by the NESO in their impact assessment and underlying data on the transmission queue, which incorporates TEC register data and responses to an RFI. For the distribution queue we have relied upon data provided directly by the DNOs.

1.51. To better understand the status of the projects in the connections queue, NESO issued a RFI to developers on 28 May 2024[23]. This was followed up with a second RFI in September 2024 targeted towards non-respondents of the first RFI.

1.52. The connections process has impacts on network planning and build, however faster network build and connections will require other reforms such as those being considered in the Transmission Acceleration Action Plan (**TAAP**)[24] and Connections end-to-end review of the regulatory framework[25]. Therefore, any the impacts of TMO4+ are also dependent on the broader policy objectives of TAAP, CAP, and the CP2030 Action Plan being delivered.

1.53. TMO4+ reform package proposes that the connection process aligns with the CP2030 Action Plan. This Impact Assessment does not assess the impacts of Government's CP2030 Action Plan.

1.54. Using this data we have estimated the likely size and technological make-up of the connections queue if the TMO4+ reform package was approved in full. The process followed and assumptions made in this process is explained in more detail in the section *Impacts on the size and makeup of the queue*.

1.55. It is important to note that there is uncertainty in the underlying queue data, and an accurate, up to date, register of all projects in the connections queue and their current readiness status is not available at this time. We have therefore had to rely on the best available data provided by NESO and DNOs, and where we have made assumptions in our analysis, we have made this clear. Although there are known deficiencies in this data, such as the lack of accuracy on readiness status of projects, our view is the accuracy is sufficient for decision making as the data is the same as NESO, DNOs and TOs have when making decisions on planning the network. Although readiness is not known exactly, the data is accurate enough that key trends and impacts resulting from application of TMO4+ criteria can be assessed. Additionally, even if perfect knowledge of the

[23] NESO Summary of land rights request for information analysis

[24] Electricity networks: transmission acceleration action plan - GOV.UK

[25] Connections end-to-end review of the regulatory framework | Ofgem

readiness of the queue was known at the point of making a decision, this would most likely change prior to implementation as projects progress in the interim point, therefore there are inherent limitations to the data and precision of impact assessment at the time of decision.

1.56. To assess the impacts on networks and connection dates, we have asked the TOs to assess how the TMO4+ reform package would impact their pipeline of projects, how this would impact the planned reinforcement works, and the likelihood of accelerations for projects that would meet the Gate 2 criteria. This analysis is limited by the lack of certainty on the post Gate 2 queue, and the scope of TO assessment which did not include power system modelling. A summary of the findings of this assessment can be found in the section, *Impact on network build and connection dates.*

1.57. We have also carried out a qualitative assessment of wider impacts.

1.58. Where costs have been identified, we have relied on estimates of these costs from NESO and network companies. Consideration of costs can be found in Sections Risk of abortive network works and Cost of "Gate 2 to whole queue" exercise.

2. Appraisal of Impacts

This section sets out the likely impacts of the connections reform proposals. This section brings together analysis carried out by NESO, the Network Owners (Transmission Owners and Distribution Network Owners), and Ofgem. It draws on multiple sources to assess the potential impacts of the TMO4+ proposals and compares these to the risks of continuing with the status quo connections process.

Impacts on the size and makeup of the queue

2.1. The size of the queue in itself is not an objective, but in order to provide a clear network planning signal, enable an increased rate of connections through efficient network build, and increase customer confidence in connections to enable investment, it is essential that the connection queue is credible. This requires it to contain projects that are ready and progressing towards completion. Furthermore, it must be able to connect projects that will deliver the correct mix of generation and storage to the timing required to achieve Clean Power by 2030 and net zero.

2.2. This section assesses the likely impacts that applying TMO4+ readiness and strategic alignment criteria would have on the queue.

2.3. As stated in the Gate 2 Methodology[26], in order to receive a Gate 2 Connection offer, a project seeking connection must:

- Have land rights or planning consents (if seeking CPO or following a DCO process) (readiness) AND meet one of the following strategic alignment criteria:
    a. eligible for relevant 'protections'; or
    b. aligned to the capacities within the CP2030 Action Plan as described in the Connections Network Design Methodology; or
    c. designated as described in the Project Designation Methodology; or

[26] Gate 2 Criteria Methodology

d. a project not within scope of the CP2030 Action Plan and of a technology type listed in the table in section 6.3 of the Gate 2 Methodology Document[27]

2.4. The relevant protections are one of the following and are only applicable to projects who hold an existing connections agreement:

- contracted to connect by the end of 2026.
- having obtained a planning consent where the planning consent was submitted before 20th December 2024.
- Holding a Contract for Difference.
- Holding a Capacity Market contract.
- (For Interconnector or Offshore Hybrid Asset projects only) having obtained regulatory approval from the Authority, in the form of either a Cap and Floor agreement or Merchant Interconnector approval (via the relevant exemptions process with the Authority).
- Projects which obtain planning consent after closure of the CMP435 Gated Application Window where inclusion of the project within Gate 2 would exceed the zonal capacity for the technology type but would not exceed the GB capacity.

2.5. It is possible (notably for battery storage) that the amount of capacity in the existing queue that is eligible for relevant 'protections can surpass the capacities in the CP2030 Action Plan. If this happens, all capacities that receive relevant 'protections' would retain Gate 2 terms. After applying the readiness criteria and strategic alignment criteria above, the queue is expected to be reduced to a size of roughly 269GW worth of projects (including built capacity), with more than 507GW of capacity receiving Gate 1 terms. Nearly 400GW of this would be expected to be made up of battery and solar technology projects, due to their overcapacity compared to the CP2030 Action Plan targets.

2.6. Built capacity is included when we quote the resulting size of the queue so that an easy comparison can be made to the CP2030 Action Plan capacities, which will be met by the current built capacity, plus projects in the queue that are connected in future.

[27] Transmission-Connected Demand, Wave, Tidal, Non-GB Generation

2.7. In the following section we show the impact of applying the readiness criteria only on generation and storage, followed by applying strategic alignment criteria, to separately demonstrate the expected impacts of and therefore case for both. Directly connected demand is analysed only under readiness for the direct impact of the proposal on the demand projects, due to the small percentage demand represents of the queue and due to the fact that demand will automatically be deemed as needed and therefore will not be impacted by the strategic alignment criteria.

Assessment of applying readiness criteria alone to the existing queue

2.8. Whether a project has obtained land rights, and the planning status of that project is not currently known for all projects. To assess the impacts TMO4+ and the application of readiness criteria would have on the queue, NESO released a RFI in May 2024 to understand the readiness of projects holding connection offers. This was followed up by a further request in September 2024 to gather more information from parties who did not respond.

2.9. Respondents were asked to signify whether they would be able to demonstrate their ability to meet land rights, either at that time (May/June 2024 and September/October 2024) or by 1 January 2025 via either:

- The project developer owning or tenanting the land on which the site will be situated.
- The project developer agreeing to lease the land from the owner of the land on which the site will be situated.
- The project developer having an option to purchase or lease the land on which the project will be situated.
- For offshore projects, the developer agreeing to use the seabed on which the site will be situated.

2.10. NESO received a total of 2869 responses, corresponding to 559 GW of capacity in the combined transmission and distribution queue. This represents ~90% of the capacity of the queue.

2.11. NESO supplemented the RFI data with a further assessment of the readiness level of the transmission queue using planning data contained within Renewable Energy Planning database, Searchland, and the English Nationally Significant

Infrastructure Project (NSIP) register[28]. We have estimated the transmission queue utilising a dataset provided by NESO containing data on planning status.

2.12. To estimate the capacity of projects with Land Rights, we have assumed any project which responded "Yes" to the NESO RFI question "Do you currently have land rights" has land rights, and any non-respondents (not identified as met a later milestone such as having planning consents) do not have land rights. This assumption therefore means that this is likely to be an underestimation of the capacity of projects that has land rights.

2.13. Responses from demand projects indicate that 8GW of projects will receive a Gate 2 offer and 11GW of projects will receive a Gate 1 offer. Demand is only required to meet readiness criteria, indicating that the projects receiving Gate 1 offers are at an early stage. Any demand project will be able to move from Gate 1 to Gate 2 as it progresses simply by meeting the readiness criteria as per Section 3.1 of the Gate 2 Criteria Methodology. Demand is not included in any of the further analysis in this section, as the remainder of this section examines the comparative impacts of readiness and strategic alignment on generations and storage.

2.14. Table 9 below shows an estimate of Transmission queue capacity for generation and storage projects, by readiness level and excluding already built projects.

Table 9: Potential transmission connection queue breakdown (GW) into Gate 1 and Gate 2 if Gate 1 and Gate 2 was determined by 'readiness' alone (Source: NESO Connections Reform Impact Assessment)

Under Construction	**Planning Consents approved**	**Awaiting Consents**	**Land Rights**	**Total Gate 2**	**Total Gate 1[29]**	**Total**
12.5	50.0	76.7	119.2	258.3	244.6	504.3

2.15. For the distribution queue, we have relied on data provided by the Distribution Network Owners, to assess the potential size of the Gate 2 distribution queue if TMO4+ readiness criteria alone were applied. The data is the DNOs' best

[28] December - Connections Reform Data Assessment

[29] Did not respond to RFI or responded "No" to whether they currently had land rights

available information on the readiness of projects within the queue and it is based on known status of users who have met milestones and submitted evidence to DNOs. However, Users are not required to provide evidence of readiness to DNOs until milestones are due, therefore the data shown below is likely not wholly accurate and having regard to when it was collected, potentially an under estimation of the current readiness level of distribution projects, particularly the capacity of projects with land rights.

2.16. Table 10 below shows the combined distribution queue capacity for generation and storage projects, by readiness level.

Table 10: Potential distribution queue (GW) after application of TMO4+ readiness criteria based on DNO knowledge of project readiness level (Source: DNOs)

Under Construction	**Planning Consents approved**	**Awaiting Consents**	**Land Rights**	**Total Gate 2**	**Land Status unknown**	**Total**
5.9	14.4	10.0	0.8	31.1	122.9	154.1

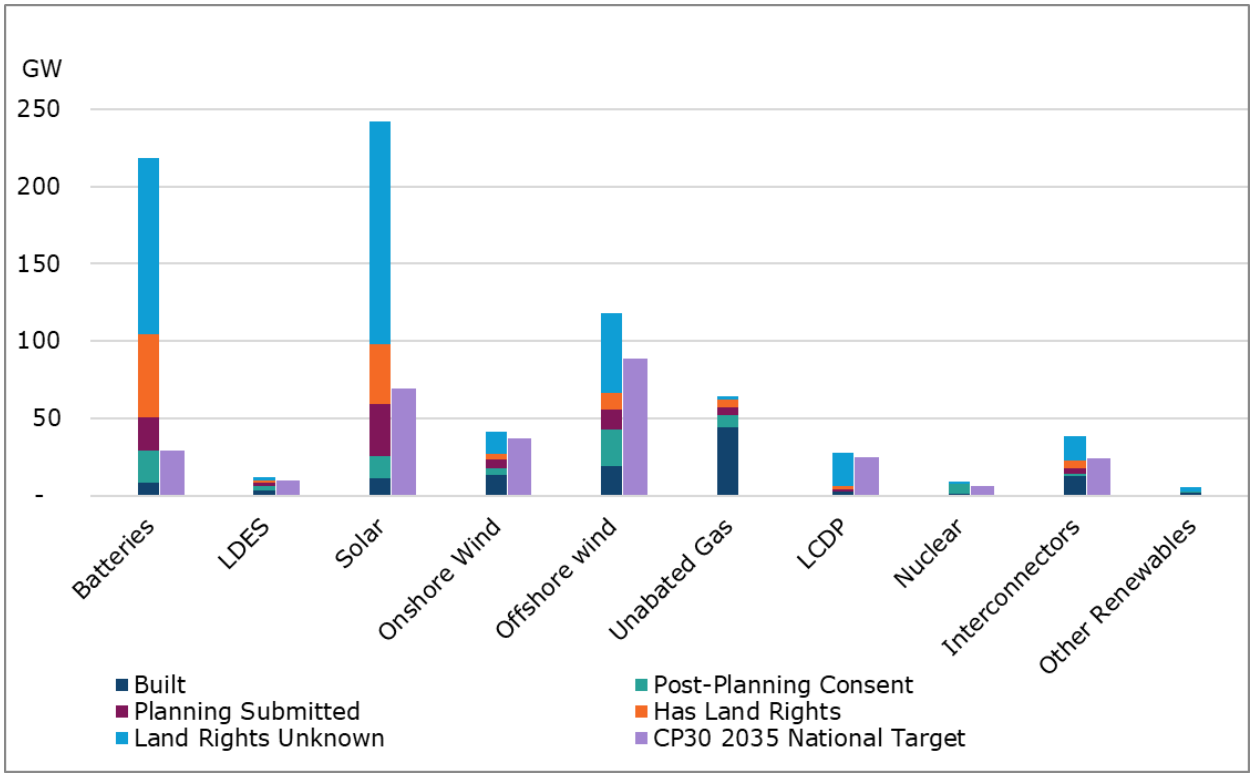
2.17. By combining the two sets of data, we can estimate that the potential size of the queue if applying TMO4+ readiness criteria alone could be 289GW (excluding built capacity), 409GW including build capacity. This would likely be higher, due to uncertainty in the number of projects which have land rights (and therefore would meet the readiness criteria). Assuming 50%[30] of those whose land rights status is not known obtained land rights prior to implementation would increase the size of the queue by 184GW, resulting in a queue of 474GW (excluding built capacity) and 593GW (including built capacity).

2.18. Applying readiness criteria alone, therefore, could result in significant capacity being given Gate 1 terms, which could be allocated to projects remaining in the reformed Gate 2 queue, potentially allowing those projects to move forward in the queue and to connect more quickly. However, the size of the queue would still be very substantially greater than expected needs.

[30] 50% was chosen as this is approximately the percentage of respondents to the RFI who said they had land rights.

2.19. Figure 11 below compares the capacity of the existing queue by technology type and split by expected readiness status, compared to the maximum capacity requirement specified in the CP2030 Action Plan for 2035 (by technology type)[31].

Figure 11: Capacity (in GWs) of the queue split by readiness and planning status compared to the maximum capacity for 2035 in CP2030 Action Plan



2.20. If, albeit unlikely, the full queue met readiness criteria, all technologies would have more capacity in the queue than is required by 2035 in the CP2030 Action Plan. If the readiness criteria were only satisfied by those projects identified as such in the RFI, there would be an oversupply of solar and batteries, and an undersupply of onshore wind, offshore wind, and low carbon dispatchable generation.

[31] When assigning capacity to technology types for hybrid projects, in alignment with assumptions made be NESO, we have assigned the total connection capacity to the high typical export capacity. For hybrid generation and battery storage projects this typically means assigning the capacity to the generation technology type. The result of this is a potential underestimation of battery storage in the queue.

2.21. Batteries would have significantly more capacity in the queue than is required in 2035 (estimated to be nearly 3-times more than the national capacity specified in CP2030 Action Plan). Solar would also be marginally oversupplied compared to identified 2035 national needs in the CP2030 Action Plan.

2.22. The potential excess capacity of certain technologies remaining in the queue, after the application of the 'readiness' criteria, would not be sufficient to ensure that the right technologies with the right capacities were in the queue to achieve a Clean Power system by 2030.

2.23. For certain technologies such as onshore wind and offshore wind, the data shows that meeting the target will be close and will depend on how many projects can meet the readiness criteria at the time of implementation. Undersupply is a realistic possibility for these technologies if the RFI data is accurate. Because over-supplied projects may drop out relatively late (compared to the pace of network build and investment horizon of other projects), the significant oversupply, particularly of batteries, risks crowding out projects of other technology types which will be needed to deliver CP2030 Action Plan.

2.24. Applying readiness criteria alone would result in a queue that is still over-supplied in certain technology, which does not give the networks the certainty they need to achieve a Clean Power system by 2030. Uncertainty for networks would result in uncertainty in networks reinforcement needs, which could either drive higher inefficient network build costs or delay network investment, have a knock-on effect for customer connection agreements and result in uncertainty for customers as to whether the connection dates could realistically be delivered.

2.25. Therefore, a further filter of the queue is necessary to ensure it focuses on the projects required to meet the CP2030 Action Plan, prevent large over-capacities on projects that are not needed and could hinder achieving Clean Power by 2030, and to provide increased certainty for network reinforcement needs.

Assessment of applying strategic alignment criteria to the queue

2.26. If the TMO4+ proposals were to be approved, projects would have to demonstrate that they are ready and meet one of the strategic alignment criteria (or are protected) to be eligible to receive / retain Gate 2 terms.

2.27. For a project to meet the strategic alignment criteria, the capacity of the entire queue ahead of that project (ordered by planning status) plus the capacity of that project must be within a capacity limit specified in the CP2030 Action Plan, unless one of the protections specified in 6.2. of Gate 2 Criteria Methodology or

strategic criterion (c) or (d) apply[32]. The CP2030 Action Plan sets out national capacity targets for some technologies, regional transmission targets for some technologies, and distribution targets[33].

2.28. Solar and battery have a specific capacity for each transmission and each distribution zone. There are 11 transmission zones and 8 distribution zones. Onshore wind has capacities set each transmission and each distribution zone to 2030, at the level of Scotland and England & Wales to 2035. All other technologies included in the CP2030 Action Plan have national capacities.

2.29. Table 11 below shows the maximum CP2030 Action Plan technology and regional capacity targets for 2030 and 2035. We have only shown the CP2030 Action Plan capacities for technologies at the regional level where those capacities will be used to determine which projects receive / retain Gate 2 terms e.g. Solar and Batteries will be allocated Gate 2 queue capacity with reference to regional capacity maximum, whereas Offshore wind will be allocated Gate 2 queue capacity with reference to national capacity maximum.

[32] NESO Gate 2 Criteria Methodology

[33] Transmission-Connected Demand, Wave, Tidal, Non-GB Generation do not have targets in CP2030 Action Plan.

Table 11: CP2030 Action Plan national 2030 technology capacities targets (to be met by existing built generation and new capacity) (Source: CP2030 Action Plan).

Technology	**2030 max capacity (GW)**	**2035 max capacity (GW)**
Offshore Wind	50	89
Nuclear	4	6
Low Carbon Dispatchable Power	7	25
Unabated gas	35	Subject to NESO designation
LDES	6	10
Batteries	27	29
Interconnectors	14	24

Table 12: CP2030 Action Plan - Onshore wind capacities

Region	**2030 onshore wind max capacity (GW)**	**2035 onshore wind max capacity (GW)**
Scotland	20.5	21.2
England and Wales	8.6	15.8
Total	29.1	37.0

Table 13: CP2030 Action Plan transmission zone capacities for solar and batteries

Region	**2030 Solar Capacity (MW)**	**2035 Solar Capacity (MW)**	**2030 Battery Capacity (MW)**	**2035 Battery Capacity (MW)**
T1 – N. Scotland	100	800	1,900	1,900
T2 – S. Scotland	600	800	3,900	3,900
T3 - N. England	500	1,400	800	800
T4 – N. Wales the Mersey and the Humber	1,200	1,700	4,200	4,200
T5 – Midlands	4,000	5,200	1,300	1,300
T6 – Central England	2,100	3,300	500	500
T7 – E. Anglia	100	900	200	200
T8 – S. Wales and the Severn	1,100	1,300	900	900
T9 – S.W. England	300	300	400	400
T10 – South England	200	200	100	100
T11 – South-East England	600	1,100	1,700	1,700
Total	10,800	17,000	15,900	15,900

Table 14: CP2030 Action Plan 2030 distribution capacities for Solar, and Batteries

Region	**2030 Solar Capacity (MW)**	**2035 Solar Capacity (MW)**	**2030 Battery Capacity (MW)**	**2035 Battery Capacity (MW)**
D1 – SHEPD	1,100	1,700	900	900
D2 – SPD	1,100	1,800	800	900
D3 – NPg	4,400	6,500	1,900	2,100
D4 – ENWL	1,500	2,300	900	1,000
D5 – SP Manweb	1,500	2,200	400	500
D6 – NGED	13,900	19,900	3,000	3,600
D7 – UKPN	8,100	11,800	2,100	2,400
D8 - SEPD	4,600	6,200	1,200	1,400
Total	36,200	52,400	11,200	12,800

2.30. To estimate the size of the new Gate 2 queue following the application of strategic alignment criteria, the following methodology was followed:

- Estimate the protected capacity for each technology type, for each transmission and distribution zone (note that CP2030 Action Plan capacities could be met or exceeded at this stage).
- Where there remains a gap between the sum of protected and built capacity, and the CP2030 Action Plan target, estimate the capacity of projects that meet the readiness criteria and add them to the queue unless the 2035 CP2030 Action Plan capacity for that technology and zone would be exceeded as a result (at which point we have assumed no further capacity for that technology type in that region would be offered a Gate 2 connection agreement).

- Sum the capacity for each technology and zone to estimate the total size of the Gate 2 queue.

2.31. Due to a lack of up-to-date built capacity data for transmission projects, we have assumed that any project with a registered connection date earlier than 1 Jan 2025 has been built and is connected. This assumption could lead to potential overestimation in built capacity at transmission; however, we think it is a reasonable assumption, as projects with a connection date before 2025 would likely be well advanced, and if not built, would likely have planning consent and therefore be protected and contribute towards the CP2030 Action Plan capacities in any event. For nuclear, we have adjusted the built capacity to only include Sizewell C on the assumption it will be the only nuclear facility operating in 2030.

2.32. For transmission projects, we have utilised data provided by NESO which incorporates their RFI data and further assessment of planning status; for distribution projects we have used DNO provided data. Both for transmission and distribution, this data likely underestimates the capacity of projects which would have land rights by the time of implementing the TMO4+ reform package, if approved. As a result, the overall size of the Gate 2 queue is likely to be an underestimate.

2.33. When evaluating what the queue may be if TMO4+ is approved and implemented, we have used the regional 2035 capacities for solar and batteries, the national 2035 targets for onshore wind, and the GB capacity target for other generation and storage technologies, in alignment with the Connections Methodologies.

2.34. We have summed the capacities in the regional queues resulting from applying the strategic alignment criteria to CP2030 Action Plan zones, to estimate the size and makeup of the queue if TMO4+ were implemented.

2.35. To account for uncertainties in readiness, and the way in which NESO will re-balance CP2030 Action Plan capacities,[34] we have assessed three scenarios which are defined as follows:

- Low estimate – Gate 2 queue made up of built and protected capacity only.

[34] 5.14. of CNDM "Due to the protections NESO has provided for existing projects, there may be cases where permitted capacities for 2030 or 2035 are exceeded in some zones. Where possible, NESO will adjust or 'rebalance' the zonal capacities to maintain alignment to the GB-wide total permitted capacities."

- Medium – as the low estimate, plus the addition of projects that have land rights (as indicated in RFI or in DNO dataset) up to the regional capacity limits.
- High – made up of built and protected capacity, and assuming all regional and national CP2030 Action Plan 2035 capacity targets are met where there is sufficient capacity in the current queue (regardless of whether they have been identified as ready or not in the RFI or DNO data).

2.36. Table 15 below shows the capacity of different generation technologies connected in our three scenarios compared with the CP2030 Action Plan 2035 national capacity targets.

Table 15: Estimated capacity of projects that could reach Gate 2 under our three scenarios compared with the national CP2030 Action Plan 2035 capacities for each technology

Technology	**Low (GW)**	**Medium (GW)**	**High (GW)**	**2035 National Target (GW)**
Batteries	29.6	33.6	35.3	29.0
LDES	6.0	10.0	10.0	10.0
Solar	25.4	39.2	68.2	69.0
Onshore Wind	17.9	26.2	31.0	37.0
Offshore Wind	43.0	66.6	89.0	89.0
Unabated Gas	52.4	52.4	52.4	0
Low carbon dispatchable power	3.1	6.3	25.0	25.0
Nuclear	7.9	7.9	7.9	6.0
Interconnectors	14.1	23.1	24.0	24.0
Other Renewables	2.8	2.9	5.8	0
Total Capacity	202.1	268.5	348.6	289.0

2.37. Our high scenario assumes a much higher level of readiness than the RFI data has shown to date. It would result in an oversupply in multiple technologies including batteries, unabated gas, and nuclear due to protected projects, and is based on NESO carrying out no re-balancing of capacities across regional or transmission and distribution boundaries in response to oversupply. This is not very likely to occur due to the readiness levels indicated by the queue data we have seen, and the expectation that NESO will carry out some rebalancing and substitutions.

2.38. We would expect the queue resulting from implementation of TMO4+ reform package to be closer to our medium case (269GW including built capacity, 150GW excluding built capacity) and closer to the national CP2030 Action Plan

2035 national targets, noting that there is under supply in some technologies and over-supply of others, which is explored below.

2.39. In all cases, application of strategic alignment criteria results in a queue that we expect to be less than 50% of the size of the current queue with a mix of generation and storage technologies that better match the CP2030 Action Plan.

2.40. The queue resulting from readiness would be 409GW including built capacity, 289GW excluding built capacity. This is almost 100% greater than the queue resulting from application of strategic alignment criteria in the medium scenario. Even in the high case, the queue resulting from strategic alignment would be 15% smaller than a queue based on readiness and would be much more closely aligned to the technology mix needed as per the CP2030 Action Plan.

Oversupply compared to CP2030 Action Plan capacities

2.41. Across the eleven transmission regions, our assessment finds that all regions show a likely oversupply of ready (ie meet Land Rights requirements and protected projects) solar and battery projects in the queue compared to the 2035 CP2030 Action Plan capacities. Where ready projects are not protected, do not satisfy any of the strategic criterion (a)-(d), and do not benefit from re-balancing on CP2030 Action Plan capacities, or substitutions, they would receive Gate 1 terms, due to breaching of the 2035 CP2030 Action Plan capacities. We estimate that there would be 71GW of ready batteries and 59GW of ready solar projects offered a Gate 1 agreement.

2.42. In addition, North Scotland, South Scotland along with South Wales, Southwest England, and South England are likely to have an oversupply of protected battery projects alone of roughly 0.1GW, 2.3GW, 0.5GW, 0.4GW, and 0.5GW respectively, compared to the 2035 CP2030 Action Plan capacities. Southwest England is projected to have an oversupply of solar projects of less than 0.1 GW.

2.43. Four distribution regions (D1-SSE, D2-SPED, D6-NGED, D8-UKPN) are likely to have an oversupply of protected battery projects[35] alone, compared to the 2035 CP2030 Action Plan capacities.

[35] When we refer to projects, we use the term in the general sense. We do not know exactly which projects will be protected, receive a Gate 2 offer, or receive a Gate 1 offer, as this would require precise knowledge of the readiness and planning status of each project, and how NESO will re-balance and substitute the CP2030 Action Plan capacities. Instead, we have estimated affected capacities by different technology types, and readiness levels, and assessed impacts for these different classes of project types. We discuss our approach to monitoring and evaluating the queue in Section 6.

2.44. NESO's TMO4+ proposal consulted on in November 2024 did not include protections for projects which obtained planning permission, and any oversupplied capacity as described above would have been given Gate 1 terms should that version of TMO4+ have been approved and implemented.

2.45. Responding to feedback from developers on the impacts this would have on both investor confidence, and the deliverability of Clean Power by 2030, NESO revised their TMO4+ proposal and introduced protections.

2.46. Although these protections result in a connections queue and pipeline of projects that exceeds the maximum capacity targets in the CP2030 Action Plan, our view is that protecting these well-advanced projects, which have overcome a major hurdle in the development lifecycle, is appropriate and proportionate. These projects are well advanced, and are likely already factored into network planning, so would not result in some of the network planning and efficiency issues described earlier in this document.

2.47. Investors are also likely to have invested significant sums developing these projects and will be continuing to invest to develop the projects at pace. NESO's protections therefore ensure that mature investments, that have a good chance of delivering and contributing to Clean Power by 2030, even if a slight deviation from the plan, can continue to progress giving the best chance of achieving Clean Power by 2030 with minimal impact on network planning and build.

2.48. Unabated gas has a capacity limit of 35 GW as specified in the CP2030 Action Plan, which is roughly in line with current built capacity of 44GW. Therefore, all unprotected unabated gas projects would be expected to be ineligible for a Gate 2 terms by default. However, the criteria have been set with the expectations that security of supply would be regularly assessed, and the Project Designation Methodology[36] would be the route to bring forward new unabated gas plan to ensure security of supply.

Undersupply compared to CP2030 Action Plan capacities

2.49. Applying the strategic alignment criteria causes a large decrease in the number of projects in the queue as compared to accepting all projects that meet readiness criteria.

[36] Project Designation Methodology

2.50. Undersupply of capacity for certain technologies in the queue is only caused where there is already an undersupply in the queue, or where projects currently holding a connection agreement cannot met the readiness criteria. By removing un-ready projects and identifying undersupply, TMO4+ highlights areas where more investment and policy support is needed to deliver the CP2030 Action Plan.

2.51. A key driver of these reforms is minimising the oversupply of certain technologies in the queue, particularly projects that are not progressing, to free up network capacity which can be used to connect undersupplied technologies more quickly. Without this prioritisation of network capacity, and queue positions, there is a risk that Clean Power by 2030 will not be delivered, and progress to net zero could be delayed.

2.52. In the medium scenario shown above, at a national level, Ofgem anticipates an under-supply of solar (30GW), onshore wind (11GW), offshore wind (22GW), low carbon dispatchable technologies (19GW), and interconnectors (1GW) compared to CP2030 Action Plan 2035 capacity.

2.53. For solar, there are differences across different regions. Noting that there is likely to be over-supply at transmission level in multiple zones, we expect solar at distribution to be undersupplied by ready projects nationally and regionally, with capacity gaps between the reformed queue and the CP2030 Action Plan 2035 capacity. (See Appendix 2 for charts showing the regional transmission and distribution queues compared to the CP2030 Action Plan Capacities for solar).

2.54. Depending on the planning status of the queue, and NESO decisions regarding rebalancing, it is possible that Solar will meet the CP2030 Action Plan 2035 capacities without the need for new capacity to join the queue in future. We are exploring the extent that substitutions and rebalancing with NESO for further clarity as to how these solar differences will be managed[37].

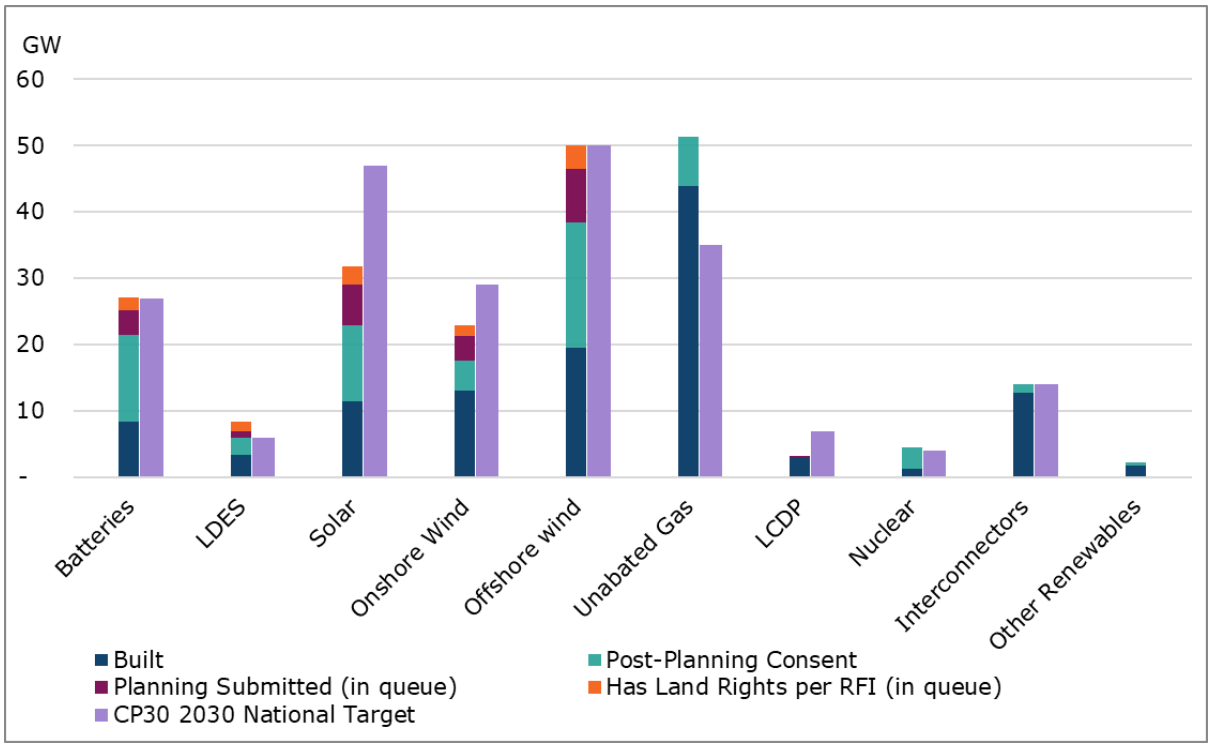
2.55. For onshore wind, there is a significant undersupply of onshore wind projects in the queue in England and Wales compared to CP2030 Action Plan 2035 targets. Our analysis indicates a gap between ready onshore wind projects and the CP2030 Action Plan 2035 target of approximately 11GW. In Scotland, we do not anticipate a significant undersupply. Indeed, if more projects meet the readiness criteria than indicated as such in the RFI, the 2035 capacity could be met in Scotland based on ready projects in the current queue.

[37] See Section 6 Monitoring and Evaluation

2.56. The capacities in the CP2030 Action Plan reflect the recent planning rule change[38], which we expect will enable more onshore wind to be developed in England. Removing projects of oversupplied technologies in the queue will free capacity for undersupplied technologies, such as onshore wind in England, to get much sooner connections dates than in the status quo. Enabling onshore wind in England to connect sooner will result in more wind, closer to demand centre, which will reduce the need for transmission capacity were that same capacity of wind to be placed in Scotland.

2.57. Figure 12 shows the estimated size of the queue following application of strategic alignment criteria broken down by progress against milestones for all projects currently holding a connection date in 2030 or sooner, compared to the CP2030 Action Plan 2030 capacities. This corresponds to the medium scenario of queue size shown in Table 15.

Figure 12: Capacity of different technology types with a Gate 2 offer in the queue, split by readiness level, compared to the maximum CP2030 Action Plan 2030 capacity (GW)

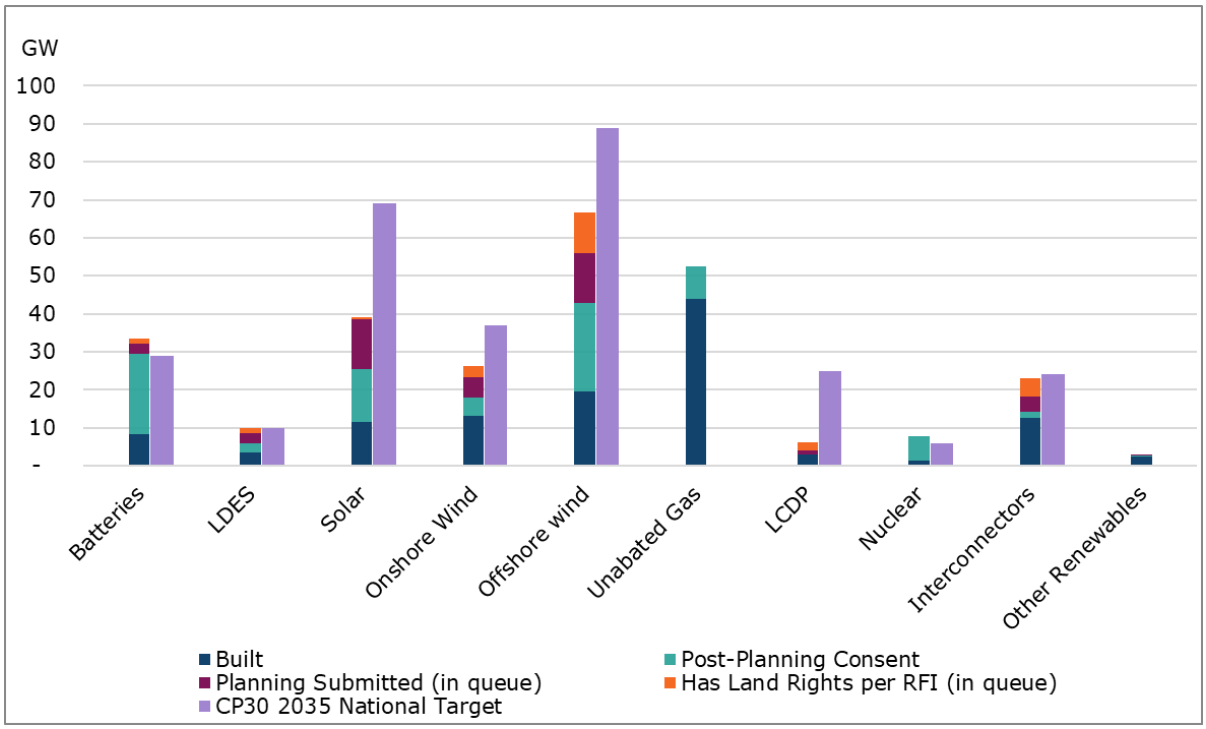


[38] Policy statement on onshore wind - GOV.UK

2.58. This shows that following the implementation of TMO4+ strategic assessment criteria, there would likely be an undersupply of solar, onshore wind, and low carbon dispatchable (LCDP) compared to 2030 capacities in the CP2030 Action Plan.

2.59. Figure 13 shows the estimated size of the queue following application of strategic alignment criteria broken down by progress against milestones for all projects which would receive a Gate 2 offer, compared to the CP2030 Action Plan 2035 capacities.

Figure 13: Capacity of different technology types with a Gate 2 offer in the queue, split by readiness level, compared to the maximum CP2030 Action Plan 2035 capacity (GW)



2.60. This shows that the 2035 capacities are met for all technologies excluding, solar, onshore wind, offshore wind, and LCDP.

2.61. Comparing Figure 12 and Figure 13 above to Figure 5 and Figure 6 in the "Problem under consideration" section shows that by applying the regional CP2030 Action Plan capacities, some ready projects are removed, meaning that there could be less projects with connections dates pre-2030 than are needed for Clean Power by 2030 despite there being enough ready projects with connection dates pre-2030. Our scenario highlights that this could be the case for batteries, and solar. To achieve Clean Power by 2030, one or more of following deviations

from the scenario assumption must happen or actions enacted to address undersupply:

- More projects meet the readiness criteria than is currently indicated by the RFI data or data provided by DNOs. (As discussed previously, we think this is possible due to projects progressing between data collection and implementation).
- Gate 2 projects which currently hold a date post-2030 receive an accelerated connection date of 2030 or sooner. This is NESO's assumption as to why attrition is not required to be explicitly included in these proposals. We think that is possible as more capacity currently hold connection offers pre-2030 than is needed for 2030, unready projects leaving the queue should free network capacity for ready projects to accelerate into.
- NESO carry out regional rebalancing and substitutions (as set out in the CNDM) to ensure the CP2030 Action Plan is delivered.

2.62. To deliver the capacity targets for 2035 set out in the CP2030 Action Plan, one or more of the following must happen:

- NESO carry out regional rebalancing and substitutions (as set out in the CNDM), particularly addressing the national solar undersupply resulting from regional Transmission oversupply, and distribution undersupply.
- New onshore wind projects to be developed in due course and receive a Gate 2 offer.
- New offshore wind projects to be developed in due course and receive a Gate 2 offer.
- New low carbon dispatchable projects to be developed in due and receive a Gate 2 offer.

Breakdown of parties not meeting Gate 2

2.63. The previous sections have demonstrated that, if TMO4+ is approved, a significant number of existing projects are likely to be given Gate 1 terms due to being unable to meet the readiness criteria. There would also likely be a smaller cohort of ready projects that exceed the limits set by the strategic alignment criteria, that would similarly be moved to Gate 1.

2.64. Table 16 below shows the estimated capacity of projects that would not meet the Gate 2 criteria in our medium scenario, resulting in their contract being varied to become a Gate 1 connection agreement conditional on satisfaction of the Gate 2 Criteria in the future.

Table 16: Estimated capacity of projects that are unlikely to meet Gate 2 criteria and therefore be moved to Gate 1 terms, by technology type and readiness status in our Medium estimate of queue size (This does not account for any zonal rebalancing or substitutions that may be undertaken by NESO)

Technology	**Planning Submitted**	**Projects with land that do not have planning**	**Projects without land or planning**	**Total (GW)**
Batteries	18.7	52.0	114.5	186.5
LDES	0	0.2	1.5	1.7
Solar	20.9	38.1	143.9	202.8
Onshore Wind	0	0	13.0	13.0
Offshore Wind	0	0	51.2	51.2
Unabated Gas	5.0	4.8	2.5	12.2
Low carbon dispatchable power	0	0	21.6	21.6
Nuclear	0	0	0.9	0.94
Interconnectors	0	0	15.3	15.3
Other Renewables	0	0	3.0	3.0
Total Capacity	44.6	95.0	367.4	507.0

2.65. We estimate that the overall cost spent by investors developing projects that would receive a Gate 1 offer could be in a range of below £1 billion to below £3 billion. Of this, we expect approximately 35% to have been spent on the projects which have submitted planning consent, which makes up 9% of the projects that would move to a Gate 1 contract. The estimates above are significantly dependent on the actual readiness of projects, for which we are dependent on RFI data and data from DNOs. It is also dependent on the extent that NESO rebalances zones and substitutes at transmission and distribution. Should the number of projects who have submitted a planning consent given a Gate 1 offer be reduced, we would expect to see the overall costs associated with projects moved to Gate 1 to significantly decrease.

2.66. However, those projects that would be moved to Gate 1 would no longer incur enabling network build costs. Whilst not quantified in the Impact Assessment, this is expected to be billions, if not tens of billions, of unnecessary/avoided network costs associated with the current queue. In addition, £5 billion of these investment costs are costs that would otherwise have been partially paid by end-consumers.

2.67. Elsewhere in these docs we set out the hard to quantify but material risks to Clean Power by 2030 and net zero, and risks to business consumers of not being able to connect due to delays or the benefits to business users of connections being sped up due to these changes[39].

2.68. All investment involves a material degree of risk in development stages, and historic evidence of the connection queue suggest it is overwhelmingly likely that a significant proportion of projects in the connections queue would not build in the next decade under the status quo. In particular, projects receiving Gate 1 terms face two very material hurdles:

- Project has to obtain planning, and in some cases, land rights (under the status quo, in time to meet all the Queue Management Milestones). We know anecdotally that as many as 2/3 of projects fail to get through the planning stage[40].
- Project will need a viable route to market to receive revenues. While each project will face individual decisions, looking across the entirety of the

[39] Letter: Unlocking growth through energy industry regulation - Energy UK

[40] Two thirds of renewables applications fail to get through planning stage

queue against the CP30 Action Plan shows a very significant level of over-supply, especially in some technologies.

2.69. We anticipate 367GW of projects in the current queue, ie projects with an existing connection agreement, would not meet the Gate 2 **readiness** criteria and therefore would not be given Gate 2 terms in the medium case. These projects would not have secured land rights, and therefore our expectation is that they would be very early on in their development and will not have invested significant resources in developing these projects, and may also be speculative in nature.

2.70. We anticipate a further 140GW of projects that meet the readiness criteria would not meet the Gate 2 strategic alignment criteria. We estimate 95GW of this 140GW would have land rights but will not have submitted a planning application. Our view is that the projects in this group would be a mixture of projects who are close to submitting planning applications and would therefore have invested resources into the preparation of these planning applications, and some that have only secured land rights and would not have invested or progressed significantly beyond this stage. We estimate 45GW of the 140GW would have submitted a planning application. Projects that fall into this category would be the most progressed of the un-protected project types, and will have invested in development activities including surveying, design, community engagement, and preparing planning applications. We expect battery and solar projects to make up the majority of the projects that would be expected to meet readiness criteria but would not be needed per the CP2030 Action Plan. LDES and unabated gas are also present to lesser extent.

2.71. We have carefully considered the implications of these outcomes for the projects, and the energy system in the interests of the consumers, recognising that TMO4+ gives the NESO specific flexibility to rebalance zonal capacities and substitute between zones when carrying out the Gate 2 to whole queue exercise and making offers. In addition, TMO4+ provides a gated process to allow projects to move to Gate 2. Projects that need to meet readiness criteria can apply to move to Gate 2 once they have taken the necessary actions. Projects that meet the readiness criteria but do not meet the strategic alignment criteria would be able to progress from Gate 1 to Gate 2 in future application windows if:

- They have received planning consent after the Gate 2 to whole queue exercise for a planning application submitted prior to 20 December 2024, and the national CP2030 Action Plan capacity for that technology has not been exceeded. Or,

- A Gate 2 projects terminates or is terminated, creating a space in the queue. Or,
- The capacities for that technology / region are increased to reflect changes to the CP2030 Action Plan or the publication of the Strategic Spatial Energy Plan (**SSEP**).[41]

2.72. We then consider the risk to projects, recognising that not receiving Gate 2 terms could have financial impacts on the affected projects including connections application fees, and investment in developing the project e.g. preparing planning applications.

2.73. For most technologies, we do not expect a significant proportion of projects that have land rights or have submitted planning applications to be removed on the basis of failing to meet Strategic Alignment Criteria (c).

2.74. We estimate 45GW of projects have submitted a planning application but would not meet the Gate 2 strategic alignment criteria. These may have spent significant sums developing planning applications and therefore may be financially impacted by these reforms.

2.75. Battery projects that have submitted planning, but do not meet Gate 2 strategic alignment criteria are most likely to be exposed to this financial risk and will be the largest group effected by these reforms. This is because the flexibilities set out at 2.71 above are more likely to be relevant to solar than to battery projects, given the current volumes in the queue compared to the CP2030 Action Plan and the Future Energy Scenarios 2024 (**FES**) projection of 70-108GW of solar generation in 2050, and 28-36GW of battery storage[42]:

- We estimate that the national capacity for batteries will be met, suggesting little need for rebalancing and that battery are projects are only likely to move from Gate 1 to Gate 2 if projects in Gate 2 terminate, to replace end-of-life assets, or a need for more capacity is identified through the SSEP.
- We do expect NESO to consider whether solar rebalancing is required, and it could reasonably be expected that more solar capacity will be needed in future (CP2030 Action Plan capacities are set at 69 GW compared to FES 70-108 GW), therefore it is reasonable to expect more ready solar projects

41 Strategic Spatial Energy Planning (SSEP) | National Energy System Operator

42 FES Documents | National Energy System Operator

to receive a Gate 2 offer in future – although all of this is contingent on the outcome of the first SSEP.

2.76. NESO will refund securities for existing projects moved to Gate 1 terms, mitigating some of the financial impact for all parties moved to Gate 1.

2.77. The projects that have progressed to submitting planning consent would suffer a greater financial impact from these reforms. As such, NESO has included additional protections for this class of projects to ensure any impacts are proportionate. Any projects that have a planning application granted after the closing of the evidence window for Gate 2 to whole queue exercise, which submitted the planning application prior to 20 December 2024, will subsequently receive a Gate 2 offer if the national CP2030 Action Plan capacity for that technology has not been exceeded.

2.78. This rule is most likely to apply to solar and battery projects, and in practice will mean that any battery and solar project currently holding a connection agreement and which receives planning consent in future will receive a Gate 2 offer unless the national CP2030 Action Plan capacity has been met. In our view, this is a fair mitigation, as it protects projects that have already invested significant sums. Going beyond this would provide further protection for projects, but would more materially undermine the connections queue being a realistic reflection of energy system need and a realistic reflection of which projects are likely to have a route to market and be commercially viable in the future.

2.79. In our view, the majority of the parties likely to be affected by these reforms (such as solar and batteries) may struggle to find a credible route to market due to oversupply compared to need. For these parties, termination under the status quo would result in cancellation costs. Additionally, network companies would have spent resources to develop network infrastructure that is unlikely to be needed, increasing energy system costs. Given the likelihood that these projects will not be needed in any event, and the savings that can be achieved through network planning focused on Gate 2 projects, we do not think on balance that projects who would be given a Gate 1 offer are being treated unfairly, given the scale of the benefits we expect this reform to deliver.

2.80. Investments always carry risk, including the risk that the law and regulation around them changes. Developers spend money at risk on developing a portfolio of project knowing that they will not ultimately finance and connect all the projects. After obtaining a connection agreement, projects still require planning

permission, a route to market, and sufficient finance to build and connect their project. Investment made prior to these milestones is done at risk.

2.81. Although we expect these reforms to provide a significant overall benefit and improve the certainty and speed of connection for all in the long run, we recognise there will be a reduction in some developers' prospects of being connected at the place and time they currently anticipate – and that ultimately, some developers with existing projects who apply for a Gate 2 confirmed offer will receive only a Gate 1 offer with an indicative connections date. In the context of the TMO4+ reforms, we are seeking to help investors manage that risk by being as clear and transparent in our decision-making process as possible.

2.82. We also want to be transparent about the inevitable limitations in the projections and data currently available. We are particularly mindful of the uncertainties about attrition rates in Gate 2 and the opportunities that will provide for those in Gate 1; as well as the outturn impacts on solar projects.

2.83. In Section 5, 'Next steps', we have asked for customers to let us know the specific impacts TMO4+ will have on their projects / portfolio of project.

2.84. Taking account of these mechanisms, we first considered the risk to the energy system that TMO4+ puts projects into Gate 1 projects that later turn out to be necessary to deliver CP2030 Action Plan. For battery projects, we think the scale of the oversupply identified in Section 1, Figure 5, means the risk of removing battery projects that later turn out to be needed is low.

2.85. Solar shows an undersupply of capacity of Gate 2 projects compared to CP2030 Action Plan for 2035, despite having sufficient projects that meet the readiness criteria, due to a mismatch between the zonal capacity targets in the CP2030 Action Plan, and the current connections queue. The result of strictly applying the zonal capacity limits is that 23GW of solar projects with planning applications submitted, and 37GW of solar projects with land rights may not meet strategic alignment criteria compared to CP2030 Action Plan regional capacities.

2.86. The Connections Methodologies allow NESO to address this potential imbalance (across transmission and distribution) and other similar imbalances in a way that reflects the overall objective of the CP2030 Action Plan, respects national capacities in the Action Plan, and accounts for the relative readiness projects. In practice, we expect NESO to use this discretion where it supports achieving Clean Power by 2030 and in accordance with its duties under the Energy Act

2023[43] and would only expect this quantity of transmission connected solar to be moved to Gate 1 terms, where re-balancing was not justified.

2.87. Similarly, if some or all of the unabated gas capacity was identified as needed for security of supply, NESO could designate these projects, which would reduce the amount of ready unabated gas moved to Gate 1.

Conclusion

2.88. The queue under the status quo connections process is large and contains a mix of technologies which do not align with the CP2030 Action Plan.

2.89. Applying TMO4+ criteria to the queue would result in a much smaller queue which will be streamlined to better deliver a pipeline of generation and storage technologies in line with the CP2030 Action Plan. The revised queue will closely match what is required per the CP2030 Action Plan, and to the extent there is any shortfall in a technology it will more effectively and transparently create the opportunity for that technology to come forward and connect.

2.90. CP2030 Action Plan is both a national technology mix and a locational mix in several key ways. Better enabling this mix to connect more rapidly should, in the view of the NESO, reduce cost of constraints and should deliver faster carbon emissions reductions compared with the status quo. Connecting an oversupply of battery energy storage and solar on the network, and generation of all types located in constrained parts of the network, could result in increasing constraints costs, lower percentage of electricity generated from renewables, and a slow decrease in carbon emissions associated with electricity generation.

2.91. To connect the generation needed to achieve Clean Power by 2030 will require a rapid increase in network build and capacity connected to the network. This is unpacked in the next section, and we see good evidence that a clearly credible queue is likely to increase the rate of connections at efficient cost, whereas we do not think it is likely that retaining the present approach to connections queuing can deliver Clean Power 2030 and do so at lowest cost to the consumer.

2.92. We fully recognise the risk that some projects who receive a Gate 1 offer are later needed but identify the mechanisms NESO has within the codes to address any unintended consequences, and mechanism to review and update the methodologies are reasonable mitigations.

[43] In particular section 163(1): the net zero objective; the security of supply objective; and the efficiency and economy objective.

2.93. We also recognise the potential impacts on the investors of projects that receive a Gate 1 offer. We see the proposed protections as providing a sensible set of mitigations, as do the processes for rebalancing zonal capacities (e.g. solar capacities at transmission and distribution) and for bringing projects forward from Gate 1 to Gate 2 as more are needed. These mitigations appear to strike a good balance between delivering a realistic queue and protecting investment in energy using transparent objective criteria; we will work with NESO to understand how they propose to apply the rebalancing ahead of the Gate 2 to Whole Queue process this year. Nonetheless, all projects have made some financial investment, and this will be more material for the small proportion that are relatively close to receiving a decision on planning applications. While investment inherently involves a degree of risk, we are explicitly seeking feedback on this point.

2.94. In the following sections we evaluate the impacts the reduced size and aligned queue, resulting from TMO4+, would have on the networks, consumers, and wider impacts.

Impact on network build and connection dates

2.95. The TMO4+ reform package would impact both transmission and distribution networks. We expect the broad impacts to be similar across both networks, however the effects are likely to be larger at transmission.

2.96. The major network impacts anticipated as a result of the TMO4+ reform package are:

- More efficient network planning due to the reduction in projects in the Gate 2 queue, and the introduction of co-ordinated network design exercises following batched application windows.
- More investment certainty for both networks (resulting from a more ready, strategically needed pipeline of projects) and customers (resulting from more certain network plans) leading to accelerated delivery of network expansion and connections.
- Reduction in the amount of network reinforcement needed.
- Risk of costs associated with abortive work carried out by network companies associated with projects that do not meet Gate 2 criteria.
- Cost to implement the TMO4+ reform package to the whole queue.

2.97. Connection agreements drive the need for network expansion, with new connections potentially triggering works, including new substation bays, new substations, reinforcement of or new electricity lines.

2.98. Network companies (TOs at transmission and DNOs at distribution) are responsible for building the network required to connect new users, and transport electricity around the system.

2.99. Ofgem set price controls for the GB electricity and gas network companies using the RIIO model. Price controls balance the relationship between investment in the network, company returns and the amount that they charge for operating their respective networks. The RIIO price control model ensures that network companies invest in a network where it is efficient and serves the interests of consumers.

2.100. Enabling network reinforcements to enable connections may either be 'attributable' to connecting customers who bear the cost or 'non-attributable' to specific connections customers. In the latter case costs would be socialised across connecting customers and consumers (recovered through TNUoS charges).

2.101. Network companies must justify the need and value for money for investments in the network. The reliability and certainty of the connections pipeline is a factor in preparing investment needs cases for both enabling and wider network infrastructure. Under the status quo, a high level of uncertainty about which projects are likely to progress towards energisation (see section on Unclear network build signal above) limits the extent to which network companies can plan and build enabling works in an efficient manner. This has led to a disconnect between the contracted capacity queue and the planned network build.

2.102. Although network companies assign reinforcement works to specific connection agreements, investment in reinforcements driven by connections may be held back until network companies have sufficient confidence that the projects associated with reinforcements are progressing towards connection. This can lead to mutually agreed delays in connection dates for the non-progressing projects, as well as knock-on delays for other projects impacted. Under the status quo, network companies account for some uncertainty around the needs case for reinforcements driven by connections; this one of the reasons behind the potential for abortive costs (see section below) if the TMO4+ reform package were to be approved.

2.103. If the TMO4+ reform package were not approved and, as an alternative, network companies accept significantly higher uncertainty and were able to significantly increase the rate of investment based on the build signal provided by the current queue (which may not be possible), there is the risk of inefficient use or waste of network resources progressing new network infrastructure which may not be utilised or may be in sub-optimal locations. The result of this inefficient build could be further constraint costs and/or higher network charges than necessary to cover network costs, including the consumer share of network reinforcement associated with unviable or not needed projects.

2.104. Under the TMO4+ reform package, applying Readiness and Strategic Alignment Criteria would give network companies greater certainty as to which projects in the connection queue will ultimately connect. In addition, planning reinforcements in alignment with the capacities in the CP2030 Action Plan would give network companies increased confidence that, when a specific Gate 2 project does not connect, there is still likely to be strategic need for the reinforcement (assuming the reinforcements are of a kind that they could be easily reused by nearby projects of a similar type). Projects that exit the Gate 2 queue could be replaced by a similar project, subject to network assessment,

using the mechanisms for advancement and capacity reallocation in the CNDM, or through an alternative project receiving a Gate 2 offer in the next window.

2.105. The increased certainty network companies would have with a smaller, rationalised pipeline aligned with strategic plans such as CP2030 Action Plan, would enable network companies to:

- focus and make more efficient use of their development resources.
- stop the development of capital-intensive network reinforcement works that will not be needed.
- progress more quickly to submitting and receiving approval for investment based on more strategic needs cases for enabling works.
- reduce the strain on the planning system and local communities, focusing more on those areas where reinforcements will be needed.
- make better supply chain decisions and enable strategic investment.

2.106. The above actions should ultimately lead to more efficient and therefore lower cost network delivery.

2.107. Our RIIO-ET3 price control is being designed to speed up the process of funding network investment, including where alignment with the CP2030 Action Plan can be demonstrated. If the TMO4+ reform package is approved, and the connections pipeline closely aligns with the CP2030 Action Plan, the process of investment approval will be further streamlined.

2.108. In addition to increasing network investment certainty, by offering Gate 1 terms to projects that are insufficiently ready and/or not aligned with CP2030, the TMO4+ reform package would result in capacity being released to be utilised by projects which remain in the connections queue. We expect this to result in accelerated dates and less enabling works may be required to facilitate advancement than would otherwise be the case.

2.109. The batching of applications via application windows under TMO4+ would also allow network companies to carry out a more co-ordinated network design by assessing batched applications together and producing a co-ordinated enabling network design that coheres with strategic planning exercises for wider works. It is expected that a co-ordinated design will have positive impacts on how efficient and cost-effective network designs are thereby reducing costs for consumers overall, both through reduced capital investment need, and more efficient operation of the system which could reduce constraint costs.

2.110. The following section breaks down the impacts on network planning and connection dates in more detail, summarising evidence provided by the TOs, as well as feedback from the DNOs. A more detailed breakdown of the assessment by TO can be found in Appendix 1: Transmission Network Operators Impact Assessment.

Transmission

2.111. We asked the TOs to assess the impact the TMO4+ reform would have on their current network plans and ability to build. TOs followed the same broad process, utilising NESO data and their own intelligence on the current readiness level of their queue and assessing what impact moving projects to Gate 1 would have on planned reinforcements. However, each TO has followed slightly different methodologies and made different assumptions. In the Appendix, we have summarised the approach used by each TO and their findings, which we accept subject to further assessment by the TOs to increase levels of specificity and certainty.

2.112. TOs provided case studies showing local queues on the network, and how they may be impacted by the TMO4+ reform package. We have summarised the case studies to protect the confidentiality and commercially sensitive information of individual projects. The case studies are illustrative only and may not represent exactly what would happen should the TMO4+ reform package be approved and implemented.

Impact on Network Build

2.113. Applying Gate 2 criteria to the existing queue would result in projects that are either insufficiently ready or that do not align with CP2030 Action plan capacities (or are not otherwise protected[44] or deemed to meet Strategic Alignment Criteria) receiving Gate 1 terms. Projects in Gate 1 could inform anticipatory network reinforcements but Gates 1 and 2 will clearly differentiate expectations. There will not be the same expectation that network companies build reinforcements for projects with Gate 1 contracts because Gate 1 projects would be earlier in development and/or not strategically aligned with the CP2030 Action Plan. Accordingly, the application of Gate 2 criteria would reduce the need for network build required to connect customers, which lowers costs and avoids

[44] The Gate 2 Methodology contains out Strategic Alignment Criteria, which includes 'protections' for specific projects. See our accompanying Minded-to Decision on the Gate 2 Methodology or the Methodology itself for detail

building unnecessary reinforcements, and would efficiently focus network build. This section contains estimates for the reduction in reinforcement works for the three transmission owners.

2.114. National Grid Electricity Transmission (NGET) estimates that 185 non-attributable reinforcement projects worth a total of £4.7bn, could potentially be removed due to the introduction of TMO4+. They also find that 532 (out of 774) unique contractual connection substation sites[45] could be impacted and two-thirds of these may no longer have any connections associated with them.

2.115. Scottish Power Energy Networks (SPEN) estimate that 25 reinforcement projects could no longer be needed for customer connections following application of Gate 2 criteria to the whole queue (no investment cost was estimated for these works and SPEN caveated that some of these works may still be required as wider works depending on future network assessments).

2.116. Scottish and Southern Electricity Networks Transmission (SSEN-T) estimate that 38 reinforcement projects could no longer be needed for customer connections following the application of Gate 2 criteria to the whole queue and noted that most reinforcement projects would also be partially impacted. The notional investment cost of these 38 works is £2.35bn (of which £0.28 bn is non-attributable).

2.117. Across each TO, applying Gate 2 criteria to the current connections queue would result in a number of connections-driven reinforcement works no longer being needed. This frees up of capacity at substations and on electricity lines.

2.118. This freed-up capacity would result in one of two outcomes:

- either avoided network reinforcements/costs; or
- if reinforcement works are assessed as needed due to other strategic drivers, this increased network capacity would likely facilitate faster connections for other parties seeking connection in future than would have been possible without TMO4+.

2.119. In totality approximately £5 billion of non-attributable reinforcement works could be avoided. We have focused on non-attributable works where there is a direct

[45] Substation in this context considers the voltage as well as the location. Therefore, a substation operating at two voltages will have been counted as two substations

link to savings for consumers, however avoided attributable works also allows investment capital to be better directed and improves network efficiency.

2.120. For non-attributable works, liability for costs spent prior to completion would be shared between generators and consumers. Under the status quo, consumers would be part-funding network reinforcement that may not be needed to efficiently achieve Clean Power by 2030 and net zero.

2.121. If these works were completed by the network companies, and generators connected to the network, the identified non-attributable investment costs would be recovered via network charges over 40 years. The proportion covered by generators and consumers would depend on the location of the network reinforcement. In any event, this notional investment which could either be avoided or cause TOs to reassess the scope of reinforcement once the connections driver changes. This would improve efficiency in allocating investment in the energy system.

2.122. Accordingly, TMO4+ and the application of Gate 2 criteria would enable:

- a stronger signal for where to develop enabling network infrastructure reflecting a more certain connections pipeline.
- more optimum siting of generation and storage projects
- better investment decisions about both enabling and wider works and avoided cost where reinforcements are not taken forward

2.123. Taken together, this would be more likely than the status quo to encourage investors to direct resources to where generation and storage is needed according to strategic energy system plans (starting with the CP2030 Action Plan).

2.124. To summarise the total costs of non-attributable costs that TMO4+ is forecasted by TOs to avoid is approximately £5 billion. As set out above, the cost of non-attributable works are socialised and, in part, paid for by end-consumers. However, it should be noted that the costs avoided for reinforcement works attributed to specific connections customers would be higher, potentially worth billions, if not tens of billions of pounds.

Connection date accelerations

2.125. There are multiple drivers of connection dates for customers, relating to the nature of the project and the network. Some of the key factors affecting project connection dates are:

- network studies and available network capacity

- network investment case approval
- the scope of enabling works needed to make the connection
- the deliverability of enabling works needed to make the connection[46]
- deliverability of the project seeking to connect[47]
- network outage availability
- interactions with other connection customers

2.126. Each of these factors could contribute to the initial timescale for, or the subsequent delay of, a customer being connected to the network. The status quo does not effectively manage or mitigate these factors in a way which delivers fast connection offers.

2.127. TMO4+ will not by itself resolve issues around how quickly network companies can build network capacity and connect users to the network. However, it will help the pace of network build by allowing network companies to focus on what is more certain and aligned with the CP2030 Action Plan. This focuses effort and allows networks to push ahead, more expeditiously, with needs cases and seek approvals for necessary enabling and wider reinforcements with increased confidence. Delivering the current network reinforcement needed to deliver the pipeline is already ambitious, so materially reducing uncertainty gives more confidence that Gate 2 connection dates can be met.

2.128. Without certainty as to parties that will meet Gate 2 criteria, and a follow up design exercise inclusive of power system modelling, it will not be possible to determine the precise impact on network plans and the extent to which parties could be accelerated. However, we do expect advancement of dates for projects in the existing queue, and particularly for projects with later dates (for example, after 2030) that are: aligned with the CP2030 Action Plan; hold relative queue positions behind projects that have been removed; and are capable of meeting earlier dates.

2.129. The assessment carried out by the TOs, in particular the substation case studies, showed that projects moving to Gate 1 terms and the resultant change to substation queues substation queues may result in acceleration of projects in

[46] Factors impacting on network reinforcement deliverability include obtaining land rights; planning permission; supply chain capacity; and construction

[47] Factors impacting on project deliverability include obtaining land rights; planning permission; route to market; finance; and construction.

some scenarios but will not always result in accelerated dates for other Gate 2 projects in every case. The reasons for this are multifactorial but capacity constraints will be an important limiting factor. However, the case studies show that accelerations are possible for existing customers depending on the scenario at the location where advancement requests are made, in particular the available network capacity following projects being moved to Gate 1.

2.130. A significant reduction in the pipeline of projects is likely to improve connection dates for new applicants seeking connection to the queue and are needed to meet the 2035 capacities in the CP2030 Action Plan, such as onshore wind in England, which in the status quo world would join the back of the queue and likely receive a connection date post-2035 and potentially in the early 2040s were it to apply today.

Distribution

2.131. We consulted the DNOs on their view of how the TMO4+ reforms will impact their ability to plan and build the network, and the costs or cost reductions associated with the TMO4+ reform package. The information they provided, and our subsequent analysis of this information is qualitative rather than quantitative but is none-the-less relevant to understanding the likely impact of TMO4+.

Impact on Network Build

2.132. As TMO4+ will raise the minimum requirements for obtaining a queue position, DNOs stated that they will be more confident that projects in the queue are able to progress, enabling them to accelerate strategic investment identified through network development plans. An example given by a DNO of this type of investment is the reinforcement of a substation that supports multiple strategically aligned projects.

2.133. DNOs stated that having a smaller and more definitive pipeline of projects will allow the DNOs to review previously identified reinforcement to determine if they are still required or can be reduced, which could diminish the amount of network build needed for new connections.

2.134. The majority of the DNOs indicated that there would likely be costs associated with re-studying the network based on the reformed queue, including the need for electrical engineering resources, and the pricing of any reinforcements that can be made at points of connection.

2.135. The DNOs stated that many distribution customers are currently subject to constraints through the Transmission network, with long lead dates being driven

by wider Transmission reinforcement. As such, the amount of reinforcement needed at the Transmission and Distribution interface will largely depend on the make-up of the reformed queue. It was, however, highlighted by one DNO that changes made to accommodate larger transmission projects could amplify issues at lower voltage levels.

Connection Dates

2.136. DNOs stated that they are unlikely to commence the design and construction of works for customer driven reinforcement until the proposed connection customer is ready to progress. They therefore posit that if all projects in the queue are ready to progress, the process of designing and building the network will move along at a faster pace, which will ultimately contribute to a reduction in overall project timescales.

2.137. TMO4+ would reduce the number of battery and storage projects in the connections queue (See section Impacts on the size and makeup of the queue). DNOs have identified that these technology types currently contribute to import and export constraints at distribution level, and as such, these constraints would be minimised by reducing the number of battery and storage projects in the Gate 2 queue.

Interaction between Network build and Clean Power by 2030

2.138. Under the status quo, one of the primary risks to achieving Clean Power by 2030 is that grid investment cannot be made at the required pace due to uncertainty in the pipeline of projects. This means that generation projects needed to achieve Clean Power by 2030, such as onshore and offshore wind, could be stuck behind projects which are either making slow progress or are not required.

2.139. TMO4+ would attempts to address these risks by issuing Gate 2 connection agreements to those who meet the Gate 2 Criteria. For the majority of projects, this would mean being sufficiently ready and meeting Strategic Alignment Criterion B in the proposed Gate Methodology by aligning with CP2030 Action Plan capacities.

2.140. When applying the Gate 2 criteria to the queue, NESO would consider capacity in two-time phases, 2025-2030, and 2030-2035. NESO do not propose to increase the permitted capacities for each technology above the ranges stated in the CP2030 Action Plan, to account for any potential project attrition, i.e. projects that obtain a Gate 2 contract, but then subsequently do not meet Queue Management Milestones and are terminated, or those that self-terminate.

2.141. There is a risk then that if any generation or storage projects terminate or are delayed beyond 2030, Clean Power by 2030 will not be achieved. Although this risk is present in the status-quo, the current size of the queue and oversupply means the risk of delivery due to lack of projects is *theoretically* lower under the status quo. It is important to caveat that this is only true in reality if the rate of network build and connections increases using the unclear signal of the current queue and network reinforcements can keep up with unexpected late-stage attrition, and the next project is ready to progress if and when the project ahead of it drops out. The build signal provided by the current queue creates inefficiency (as set out above) and network companies have often not been able to keep up with late-stage attrition.

2.142. It may be possible to achieve Clean Power by 2030 with higher permitted capacities than those in the Action Plan. Accordingly, one way that stakeholders have proposed to mitigate the risk posed by projects exiting the Gate 2 queue would be to increase the capacity of projects which receive Gate 2 terms above the maximum capacity specified in CP2030 Action Plan. This option was considered and not taken forward by NESO, as it would be seen to undermine the main benefits of TMO4+ to give certainty to networks on the pipeline needed to be delivered.

2.143. We believe that attrition in the queue is a key risk associated with TMO4+. However, we believe that the following mitigation measures will reduce the likelihood of this risk materialising:

- The CP2030 Action Plan contains capacities to 2035. This provides a contingency over what is needed for 2030. This contingency would play a similar role to an attrition figure and has the advantage of being grounded in a Government Action Plan informed by NESO advice rather than being an arbitrary 'buffer' to account for post Gate 2 attrition. As noted in our accompanying Minded-to Decisions on the Gate 2 Methodology and CNDM, network companies would need to draw on 2035 capacities and offer sufficient pre-2031 dates for this contingency to be effective.
- Projects can be accelerated or reallocated into capacity gaps created by projects which unexpectedly terminate their connection agreement. Projects that are in Gate 1 can also fill gaps if applying at the next window.
- Substitution between adjacent and overlying zones can be used to fill capacity gaps in the same technology class.

2.144. In addition to the above mitigations in the TMO4+ proposal, it is important to note that although the connections queue will be assessed based on capacities to 2030 and capacities to 2035, the network companies can and in our view should, seek to accelerate network build and aim to connect more capacity than is needed for 2030, by 2030. This is an assumption that NESO has made in its proposals. Accordingly, we expect network company plans, including RIIO-T3 plans and re-openers, to demonstrate coherent needs cases for the enabling infrastructure needed for Clean Power by 2030, accounting for projects exiting the queue before 2030 and the 2035 capacities in the Clean Power 2030 Action Plan.

2.145. We think it is likely that more projects meeting Gate 2 criteria will already hold a connection date pre-2030 than is needed by 2030. Further, we expect NESO to work with TOs to consider the extent to which it would be possible to accelerate CP2030 capacities for 2031-35 with current 2031+ connection dates to 2030 or before, filling capacity gaps released by the provision of Gate 1 terms to projects not eligible for Gate 2. The NESO has stated that 15-35GW could be accelerated. We will work with NESO and network companies to verify this, but this expectation has been set and the priority to deliver against strategic needs in the CP2030 Action Plan is reflected in guidance relating to price controls.

2.146. We are minded to agree with NESO's stance that this approach would remove the need for post Gate 2 explicit attrition assumptions to be introduced at this time, principally because, in effect, 2035 capacities would fulfil the same function as it provides a level of overbuild for 2030 (which would in any case be required in the 2031-35 period). However, the need for attrition will be kept under review. After receipt of Gate 2 evidence, we expect NESO to consider if, based on new information, there is any reason to review and update the Methodologies. In doing so, NESO should consider whether its Methodologies remain likely to result in the connection of expected generation capacities by 2030 as well as faster connections for demand. We also expect to further consider and validate NESO's assumption that no attrition is necessary, including considering the extent to which 2031-35 capacities are likely to receive pre-2031 dates once network company implementation plans are more developed.

Risk of abortive network works

2.147. Implementing TMO4+ would have an impact on network plans with TOs likely to identify network reinforcements that would no longer be needed. Where TOs have already incurred costs for network reinforcements associated with projects that have been moved to Gate 1 that cannot be re-used by Gate 2 projects, or for other system reasons, TOs will recover these costs from the NESO, who will in turn recover through transmission network charges.

2.148. The cost of the abortive works is dependent on the following:

- The number of projects that are moved to Gate 1
- The impact the removal of these projects from the connection queue has on planned network reinforcements.
- The cost of work TOs have spent to date.
- Whether or not reinforcements can be re-used

2.149. Under the status quo, users are liable for and securitise a share of the costs of these works, and in the event a project terminates its connection agreement or reduces its capacity, the user pays a cancellation charge which covers the costs of any abortive works carried out by the TOs. If the user does not do so, then NESO will then draw down upon the security.

2.150. Under TMO4+, users holding a Gate 1 agreement, including users moved from the existing queue to Gate 1, will not have network reinforcements in their agreement and consequently will not be liable for (or required to securitise) any TO work until they join the Gate 2 queue. Users that have previously posted securities but are then moved to Gate 1 will have their securities returned by the NESO (as they are no longer liable for the TO works).

2.151. Therefore, there is a risk that TMO4+ results in the TO having carried out abortive work for projects that are moved into Gate 1, which they will not be able to recover from the user that triggered those specific reinforcement works but the TO will be able to subsequently recover from the NESO.

2.152. The exact cost cannot be estimated precisely. However, NESO has assessed a likely range of potential abortive costs resulting from TMO4+ to be between £220million-£960million. (This is compared to a total TO final sums[48] spend over the same period October 2025-March 2026 of £8.5 billion). However, we would

[48] Defined in the CUSC. Is the amount payable by a user on termination of a Construction Agreement.

not expect this to involve a significant amount of abortive works relative to the overall cost of works being carried out by TOs.

2.153. The reason for the comparatively low range is because under the TMO4+ reform package the projects most likely to be given Gate 1 terms are those closer to the back of the queue, and those that are less progressed. It follows that TOs are less likely to have invested significantly in the network reinforcements needed to connect these projects. If there are any unprotected projects given a Gate 1 offer that have an existing pre-2030 connection date, it is more likely that they would be less reliant on network reinforcement as they would have secured a queue position before the need for significant network reinforcement was required to connect new capacity, therefore the network reinforcement associated with these projects is more likely to be needed and adapted for an alternative project that meets Gate 2 in the same location.

2.154. Further, we expect TOs and NESO to work to maximise the re-use of any work carried out and allow for sufficient time and assessment before classifying work as abortive and thereby seeking the associated costs to be recovered.

2.155. As referenced above, the established process is that if reinforcements are underway or completed and a connections customer cancels, that customer is then liable for a cancellation charge or NESO draws on the security. Waiving liabilities for connections customers that are moved to Gate 1 terms would mean that NESO pays the relevant TO and recovers this amounted via the Transmission Network Use of System Charges (TNUoS) demand residual.

2.156. NESO have estimated the £220million-£960million abortive cost range cited above by taking the TO Final Sums data provided through the security process (from the previous security period) and filtering this data by both Local Asset Reuse Factor (LARF)49 and completion year (of each scheme) to estimate a secured (via TO Final Sums) £ per year per % reuse value for TO Final Sums spend estimates across two scenarios, as set out below.

2.157. The high case estimate is based on secured spend with less than 50% reuse for schemes planned to commission in 2027 and beyond. The low estimate case is based on secured spend with less than 20% reuse in 2033 and beyond. The secured spend taken for such schemes relates to the October 2025 to March 2026 period i.e. the estimate of what would have been spent in the period in

49 LARF is an estimate (provided by the Transmission Owner) of what percentage of a reinforcement could be reused should the generator cancel their connection.

which NESO and TOs would likely know that the spend had become abortive, after the conclusion of the Gate 2 to Whole Queue process. The network reinforcements identified as 'at risk' of being abortive using the above method were then reviewed by the TOs to remove any schemes that they considered were not materially at risk in practice e.g. strategic network reinforcements, such as through the ASTI process.

2.158. The cost was therefore estimated with the more strategic schemes/costs removed from the estimation to provide an indicative abortive cost range.

2.159. This method indicates the costs which are more likely to become abortive than others. It does not estimate the costs which may actually become abortive by reference to which projects are likely to make up Gate 1 and Gate 2.

2.160. It is therefore important to note, that the range given is a reasonable assessment of the cost, and not a low and high limit of the abortive costs. The cost of abortive work could be lower than £220million, and higher than £960million, and can only be determined once the connections pipeline post implementation and the resultant impact of this on network plans is understood. If TMO4+ is approved, we would work closely with companies to scrutinise costs and ensure these are minimised where possible. We would expect to gain a better understanding of these risks following the closure of the Gate 2 to whole queue application window, and would monitor these impacts through the subsequent redesign exercise carried out by the TOs.

2.161. Using the above range of potential abortive costs, and assuming NESO recovers these costs via TNUoS in a single charging year (assumed FY27/28), would result in an increase in domestic users' standing charges of £2.82-£12.33 for one year[50]. The impact of this on different domestic consumer types is assessed in Section 3.

2.162. The DNOs also highlighted the risk of abortive distribution network works; the risk has not been quantified but DNOs provided qualitative responses. Overall, DNOs held the view was that abortive costs would be zero or very low (when compared to potential abortive costs at transmission). Network reinforcement at distribution tend to take less time to complete than at transmission and therefore networks spend money closer to the connection date. Furthermore,

[50] Ofgem are currently reviewing standing charges. Standing charges: update on our review | Ofgem

DNOs consider it is likely that any projects they are spending money on now will meet Gate 2 and therefore use the works.

2.163. If TMO4+ is approved, it is important that any potential abortive costs are closely monitored, that appropriate checks and balances are in place to ensure consumers are getting the best value for money from network companies, and that any impacts to consumers are mitigated.

2.164. Ofgem can explore different recovery mechanisms and phasing for any abortive costs to minimise the impact to consumers. This may include mechanisms which spread the cost over a longer period, or recovering via a volumetric basis (unit rates) rather than standing charges.

Cost of "Gate 2 to whole queue" exercise

2.165. To implement TMO4+, the NESO and network companies will have to carry out the following activities: apply the Gate 2 criteria to the current connections queue, evaluate evidence provided by users, re-design network connections, re-assess enabling and wider works, and update connections agreements. In doing so, network companies and the NESO will incur costs.

2.166. Transmission owners are funded to carry out this activity under RIIO-ET2 through their Closely Associated Indirect and Business Support cost categories, and therefore we do not anticipate that there would be any material increase to network charges associated with this activity.

2.167. NESO recover their operating costs through Balancing Services Use of System (BSUoS) charges, and therefore an increase in operational costs by the NESO would result in a corresponding increase to BSUoS.

2.168. NESO estimate the increase in operating costs to implement TMO4+ to be £8 million (compared to an approximate total BSUoS cost of £3.54bn[51]), which we would expect to be recovered in FY26/27 BSUoS charges. This equates to an approximate £0.03 / MWh[52] increase in electricity unit prices.

Conclusion

2.169. The status quo creates a disconnect between the contracted capacity in the connections queue and the reality of likely future energy mixes. This creates the dual risks of slow network build/connections as networks try to manage the

[51] Based on £1.29bn for period Apr-Sep 25 BSUoS Fixed Tariff 5 and Draft Tariff 6 and £2.25bn for period Oct 25- Mar 26. BSUoS Fixed Tariff 6

[52] Based on a chargeable volume of 270TWh

uncertainty the status quo creates, and of inefficient network build as networks try to meet all stated connection requirements.

2.170. Each risk is material. The rate of connections to the network will need to increase significantly to approximately 20GW[53] on average between 2025-2030 up from 8GW average between 2019-2024. On balance, we believe that TMO4+ is more likely to enable accelerations to connection dates compared to the status quo, and in doing so will increase the chances of delivering the CP2030 Action Plan capacities on time compared with the status quo.

2.171. Networks estimate that they can avoid approximately £5 billion in costs that end-consumers would have been part-liable for, with billions, if not tens of billions of pounds, more of avoided costs that developers would have been liable for projects that may not ultimately delver. This cost avoidance is driven as part of delivering a more certain pipeline of projects aligned with the CP2030 Action Plan.

2.172. The costs of the Gate 2 to whole queue exercise are, in our current view, proportionate and justified compared to the increase in efficiency and consumer benefit. The primary cost associated with implementation of TMO4+ arise from the risk that consumers will be liable to pay for abortive works carried out by network companies. This is very materially below the value of the works at stake, but nonetheless, this must be carefully monitored and mitigated. Overall, we believe that TMO4+ is likely to deliver beneficial impacts to network planning and build, enabling the network companies to design the network in the most economic and efficient manner to achieve Clean Power by 2030.

[53] 219GW capacity required for 2030 minus 119 GW built capacity, to be delivered over the next 5 years.

Impacts on Consumers

2.173. The Electricity Act 1989 ('**EA89**'), section 3A, outlines the principal objective of the Authority, which is to protect the interests of both current and future consumers in relation to electricity conveyed by distribution and transmission systems. The legislation provides those interests are their interests as a whole and include, but are not limited to, their interests in the Secretary of State's compliance with the duties under sections 1 and 4(1)(b) of the Climate Change Act 2008 (net zero target for 2050 and five-year carbon budgets), and the security of the supply of the electricity to them. Another significant aspect of consumer interests would be the costs faced by consumers eg in respect of the funding of relevant network expenditure to facilitate connections.

2.174. It is our assessment that TMO4+ is consistent with our principal objective by, amongst other things, enabling work to rapidly decarbonise the energy system efficiently - in a manner that avoids an unnecessary overbuilding of the network at additional cost to consumers. We also recognise that decarbonisation increasingly insulates GB electricity consumers from the future risk of further fossil fuel driven price spikes and enhances security of supply and contributes towards sustainable development.

2.175. A number of further benefits stems from the role connections reform is expected to play in achieving Clean Power by 2030, which are hard to quantify. As such, we have summarised some of the key benefits which we expect connections reform to help enable by reference to the potential impacts outlined in the Clean Power Action Plan:

- By decarbonising the power system, it should help to shield consumers from any future international energy price spikes (which lead to increased consumer bills) by reducing reliance on fossil fuels.
- Providing the foundation to build an energy system that can bring down bills for households and businesses for good.
- Increasing consumers' energy independence through the rollout of rooftop solar panels alongside domestic batteries, EV charging, heat pumps, and other green technologies to cut down on the cost of bills and to fatten the peak demand curve.
- Reducing our reliance on fossil fuels, which contribute to air pollution - cleaner air will benefit both human health and wildlife.

- Increasing consumers' ability to reduce their global footprint by making green spending and lifestyle choices easier/the default.

2.176. In addition, NESO advice concluded that if Clean Power 2030 is delivered effectively and in line with plans, then it can be delivered without bills increasing. Wholesale costs are likely to decline in the early 2030s as a result of the rollout of renewables, and we expect bills to start to decline as a result. In addition, by delivering the assets required in the right locations it should result in reduced system costs both through avoided network build and reduced constraint costs.

2.177. Our view is that – so long as costs are controlled and arrangements made to maintain security of supply – Clean Power by 2030 is in the consumer interest as it will partially insulate electricity consumers from economic shocks caused by volatile international gas markets and meet our legal commitment to meet the carbon budgets and net zero by 2050.

2.178. Compared to the status quo, we agree that TMO4+ would better facilitate the delivery of the Clean Power by 2030 action plan, and as such is expected to deliver decarbonisation of the electricity system without an increase to consumers bills.

Policy Costs

2.179. As described above, applying the TMO4+ process to the existing queue would incur costs for both the NESO and network companies, which would likely be recovered through network charges, and ultimately, consumer bills. However, these should be considered in the context of the previous section (and the document entitled 'Consultation: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment') of potential long-term consumer benefits resulting from efficiently gains. For example, ensuring that technologies are placed optimally and in line with the wider network build, would avoid unnecessary network build, borne by connection customers and end-consumers (if not attributable to one specific project) and avoids unnecessary constraint costs borne by end-consumers.

2.180. We have identified the following costs associated with the implementation of TMO4+ which would be borne by consumers:

- Network re-design and offer updates following 'Gate 2 to whole queue'.
- Re-imbursement of transmission owners for any abortive works on network no longer require or re-usable following 'Gate 2 to whole queue'.

2.181. NESO have estimated the costs of the network re-design to be £8million. This will be recovered in 2026/27 via BSUoS charges and is estimated to result in a negligible increase in electricity unit prices (£0.00003/kWh). Transmission owners will also incur costs, but this is funded through RIIO-ET2. The costs associated with the re-imbursement of transmission owners for any abortive works is dependent on the results of Gate 2 to whole queue, and how much (if any) work carried out by the transmission owners is abortive.

2.182. NESO and TOs have estimated the abortive works to be in the range £220million - £960million. Under existing arrangements, these costs would be recovered via TNUoS in 2027/28. It is estimated that this would result in an increase in annual standing charge of £2.82-£12.33 for one year but as above, we intend to monitor the level of abortive costs and will explore mitigations, as appropriate.

Distributional Impacts

2.183. We have assessed the impact the above increases in standing charges would have on different consumer types. We have run two scenarios in two models (described in "Risk of abortive network works" section):

- Lower: £2.82 per domestic user per year (for one year)
- Higher: £12.33 per domestic user per year (for one year)

2.184. We have used the Ofgem domestic distributional framework model to identify the additional cost in electricity expenditure as a percentage of income. The Ofgem Domestic Distributional Framework Model enables us to calculate the additional disposable income that households in specific groups would need to devote to the higher standing charge.

2.185. In addition, we have subsequently conducted additional internal analysis to identify the equity weighted difference in electricity bills by archetype and decile. This calculates an equity weighted impact (taking into account the marginal utility of income – the premise that one additional £ of impact is worth more to a lower income household than a higher income household) for households impacted by the change.

2.186. As shown in the tables below, in the lower cost scenario this ranges from 0.01% of disposable income for top quintile households to 0.03% for bottom quintile households. Unemployed households in the bottom quintile will face the highest proportion of disposable income at 0.04%.

2.187. Under the higher cost scenario, these figures increase ranging from 0.02% of disposable income for top quintile households to 0.13% for bottom quintile households. Unemployed households in the bottom quintile will face the highest proportion of disposable income at 0.16%.

Table 17: Lower cost scenario – electricity direct debits

Quintile groups of all individuals ranked by equivalised household disposable income

Consumer Type	Bottom	2nd	3rd	4th	Top	All individuals
Pensionable age	0.03%	0.02%	0.01%	0.01%	0.01%	0.01%
Disabled	0.03%	0.02%	0.01%	0.01%	0.01%	0.01%
Rural areas	0.03%	0.02%	0.01%	0.01%	0.01%	0.01%
No internet access	0.03%	0.02%	0.01%	na	na	0.02%
Unemployed	0.04%	0.02%	0.01%	0.01%	0.01%	0.02%

Lone parents	0.03%	0.02%	0.01%	0.01%	na	0.02%
ALL	0.03%	0.02%	0.01%	0.01%	0.01%	0.01%

Figure 14: Savings in energy spend as a % of income for different consumer types and income deciles (lower scenario)

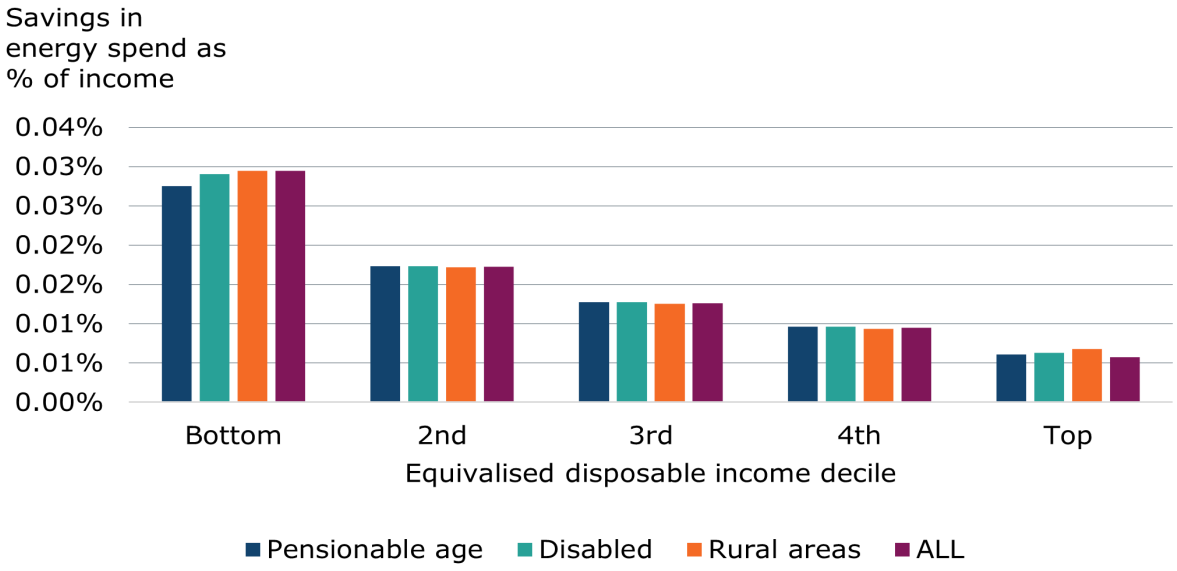
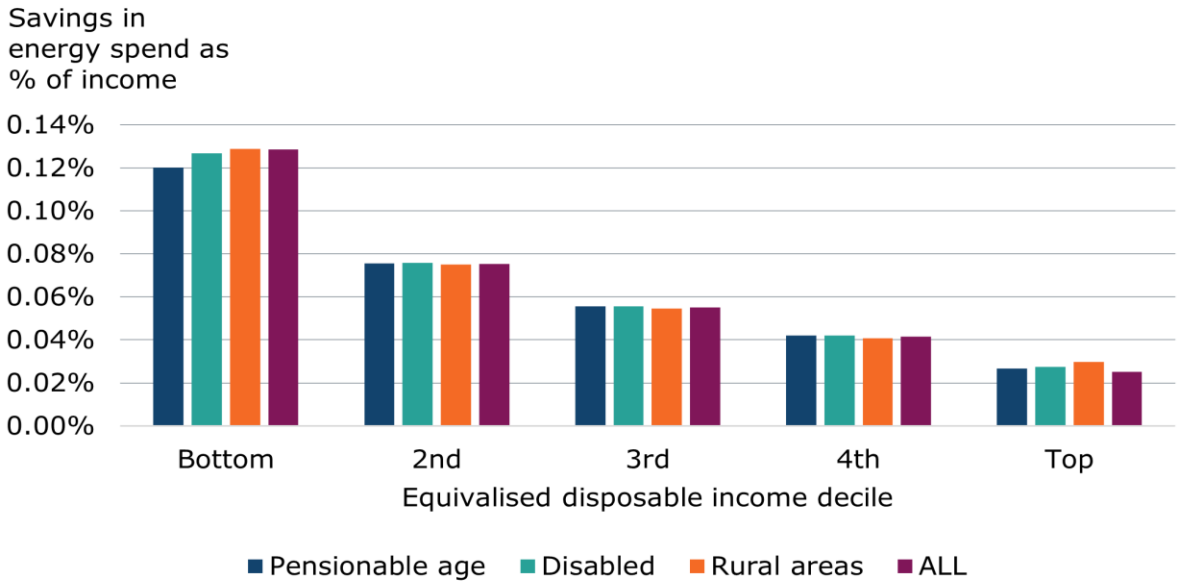


Table 18: Higher cost scenario – electricity direct debits

Quintile groups of all individuals ranked by equivalised household disposable income

Consumer Type	Bottom	2nd	3rd	4th	Top	All individuals
Pensionable age	0.12%	0.08%	0.06%	0.04%	0.03%	0.06%
Disabled	0.13%	0.08%	0.06%	0.04%	0.03%	0.06%
Rural areas	0.13%	0.08%	0.05%	0.04%	0.03%	0.06%
No internet access	0.13%	0.08%	0.06%	na	na	0.07%
Unemployed	0.16%	0.08%	0.06%	0.04%	0.02%	0.07%
Lone parents	0.13%	0.08%	0.05%	0.04%	na	0.07%
ALL	0.13%	0.08%	0.06%	0.04%	0.03%	0.05%

Figure 15: Savings in energy spend as a % of income for different consumer types and income deciles (higher scenario)



2.188. The Ofgem Domestic Distributional Framework Model does not calculate an income distributional weighted impact on households. HM Treasury distributional weights to account for the varying marginal utility of income across the income distribution. Low-income households will place greater value on a given decrease in their energy bill than a high-income household, with a large disposable income and lower marginal utility of income.

2.189. The use of equity weights enables us to present, in £ terms, the relative impact on households at different income levels. Therefore, we have also tested the proposed changes to the standing charge within Ofgem's Distributional Impacts framework model. This has produced equity weights for a range of consumers' archetypes.

2.190. We have conducted additional analysis to calculate the additional cost in equity terms. Each Archetype and decile have an associated equity weight. We calculate decile equity weight using the following formula:

$$EQ_{A,D} = \frac{\left(\frac{1}{I_{A,D}{}^{1.3}}\right)}{\left(\frac{1}{I_P{}^{1.3}}\right)}$$

2.191. Where $EQ_{A,D}$ is the equity weight, $I_{A,D}$ is the household net income by archetype and decile, I_P is the weighted average (population level) household net income, and 1.3 is the marginal utility of income.

2.192. For example, F16 Decile 1 (lowest) has an equity weight of 15.58 compared to J23 Decile 10 (highest) which has an equity weight of 0.28. We multiply the expected additional standing charge by the equity weight to estimate the relative impact (accounting for the marginal utility of income) for each archetype and decile.

2.193. The counterfactual is a zero-cost scenario (0p/day standing charge) and the factual uses the additional standing charge per day calculated from the Connections Reform Transmission Charge estimator model (0.77p to 3.38p/day)

2.194. The expected equity weighted cost in the lower scenario ranges from £44.04 for F16 Decile 1 consumers to £0.80 for E13 Decile 10 consumers. Among all consumers, the impacts range from £19.98 (lowest income decile) to £1.00 (highest income decile).

2.195. For the higher cost scenario, the range is £192.16 for F16 Decile 1 consumers to £3.47 for E13 Decile 10 consumers. Among all consumers, the impacts range from £87.19 (lowest income decile) to £3.47 (highest income decile).

Table 19: Difference in electricity bill * Income distributional weight, DD, £ per customer per year, OECD equivalised net income deciles (negative = worse off). Lower cost scenario.

Archetype	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10
A1	-£23	-£12	-£9	-£7	-£6	-£6	-£4			
A2	-£38	-£12	-£10	-£5	-£6	-£3	-£2	-£2		
A3	-£31	-£11	-£9	-£6	-£5	-£3	-£2	-£3	-£1	
B4	-£27	-£13	-£9	-£7	-£6	-£5	-£4	-£2	-£2	
B5	-£20	-£12	-£8	-£5	-£5	-£3	-£3	-£2	-£2	-£2
B6	-£23	-£11	-£8	-£5	-£4	-£3	-£2	-£2		
C7	-£12	-£5	-£5	-£4	-£3	-£2	-£2	-£2		
C8	-£11	-£7	-£7	-£4	-£4	-£3		-£2	-£1	-£1
C9	-£33	-£11	-£8	-£6	-£5	-£4	-£3	-£2	-£2	-£1
D10	-£16	-£9	-£7	-£4	-£4	-£3	-£2	-£2	-£2	-£1
D11	-£40	-£11	-£9	-£7	-£6	-£4	-£3	-£3	-£2	-£1
D12	-£25	-£11	-£8	-£6	-£4	-£4	-£3	-£2	-£2	-£1
E13	-£9	-£5	-£3	-£2	-£2	-£2	-£2	-£1	-£1	-£1
E14	-£10	-£5	-£4	-£3	-£3	-£2	-£2	-£1	-£1	-£1
F15	-£12	-£5	-£4	-£3	-£3	-£2	-£2	-£1	-£1	-£1
F16	-£44	-£9	-£8	-£7	-£5	-£4	-£3	-£2	-£2	-£1
G17	-£14	-£12	-£8	-£7	-£3	-£3	-£2		-£2	-£1
G18	-£30	-£11	-£7	-£7	-£4	-£4	-£2	-£2	-£2	-£1
H19	-£38	-£9	-£9	-£5	-£5	-£4	-£3	-£2	-£2	-£1
H20	-£15	-£7	-£7	-£6	-£4	-£3	-£3	-£2	-£2	-£1
I21	-£12	-£7	-£5	-£3	-£3	-£2	-£2	-£2	-£1	-£1
I22	-£27	-£9	-£7	-£7	-£4	-£3	-£3	-£2	-£2	-£1
J23	-£16	-£4	-£3	-£3	-£2	-£2	-£2	-£1	-£1	-£1
J24		-£5	-£3	-£2	-£2	-£2	-£2	-£1	-£1	-£1
All	-£20	-£8	-£6	-£4	-£4	-£3	-£2	-£2	-£1	-£1

Table 20: Difference in electricity bill * Income distributional weight, DD, £ per customer per year, OECD equivalised net income deciles (negative = worse off). Higher cost scenario.

Archetype	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10
A1	-£102	-£54	-£41	-£32	-£24	-£25	-£19			
A2	-£164	-£53	-£43	-£23	-£27	-£13	-£8	-£7		
A3	-£137	-£49	-£37	-£24	-£21	-£13	-£9	-£13	-£5	
B4	-£119	-£55	-£37	-£29	-£25	-£20	-£16	-£9	-£11	
B5	-£87	-£50	-£36	-£22	-£20	-£13	-£15	-£8	-£9	-£8
B6	-£98	-£48	-£35	-£22	-£20	-£14	-£9	-£11		
C7	-£52	-£23	-£20	-£16	-£12	-£10	-£9	-£9		
C8	-£48	-£30	-£28	-£16	-£16	-£13		-£8	-£5	-£4
C9	-£143	-£48	-£33	-£26	-£20	-£16	-£12	-£10	-£8	-£5
D10	-£71	-£41	-£30	-£19	-£18	-£15	-£11	-£9	-£7	-£6
D11	-£174	-£48	-£37	-£29	-£24	-£17	-£12	-£11	-£9	-£5
D12	-£109	-£47	-£35	-£24	-£19	-£15	-£13	-£10	-£8	-£5
E13	-£39	-£22	-£15	-£9	-£9	-£8	-£8	-£6	-£4	-£3
E14	-£46	-£22	-£17	-£12	-£11	-£8	-£8	-£6	-£4	-£4
F15	-£52	-£24	-£18	-£13	-£11	-£8	-£7	-£6	-£5	-£3
F16	-£192	-£38	-£36	-£30	-£23	-£16	-£12	-£10	-£9	-£5
G17	-£63	-£54	-£36	-£29	-£11	-£14	-£10		-£7	-£4
G18	-£132	-£47	-£31	-£30	-£18	-£16	-£8	-£8	-£8	-£4
H19	-£167	-£41	-£38	-£24	-£21	-£17	-£13	-£8	-£8	-£5
H20	-£65	-£31	-£30	-£24	-£19	-£15	-£11	-£10	-£7	-£5
I21	-£51	-£30	-£22	-£15	-£13	-£10	-£9	-£7	-£5	-£4

2.196. Our view is that the costs to consumers are outweighed by the benefits of the proposals, including the potential for avoided network costs. In the first instance, we will seek to mitigate these costs by minimising the amount of works classified as abortive by TOs by encouraging sensible re-use of network assets.

2.197. We recognise that recovery of the costs via standing charges in one year would impact consumers (to a greater or lesser extent depending on the final value of any costs) and will have a higher impact on lower income households. As set out above, we will monitor the costs incurred and, particularly where resulting costs are at the higher end of the expected spectrum, seek to mitigate the impact of costs to consumers, particularly lower income households. For example, we could explore ways to spread the costs over more than one year.

Other statutory duties

2.198. In this section, we assess the likely impacts of connections reform against our other statutory duties.

Competition

2.199. Ofgem carries out its functions in a manner it considers best calculated to further the principal objective, wherever appropriate, by promoting effective competition[54] and, in so doing, having regard to the need to secure that all reasonable demands for electricity are met, that licence holders are able to finance their licensed activities, and the need to contribute to the achievement of sustainable development.[55]

2.200. Therefore, where appropriate, we must also promote effective competition between persons engaged in, or in commercial activities connected with, the generation, transmission, distribution or supply of electricity.

2.201. In the current connections process, developers are given a position in the queue on a first come first served basis, and no other factors, such as their readiness, economic competitiveness or alignment with strategic system plan are taken into consideration. Obtaining a grid connection under the status quo does not contain any competition beyond who can apply first. Allocation of what has become scarce grid capacity is therefore inefficient and is not resulting in the best outcomes for developers or consumers.

2.202. Once a generation or storage project has a grid connection, there are multiple additional hurdles it must overcome before finally being constructed and connected to the network. These hurdles include securing planning consents, securing supply chain capacity, securing a route-to-market (such as Contracts for Difference, or Power Purchase Agreements), sourcing financing, and completing construction.

2.203. To overcome each one of these hurdles, projects compete with one another. This competition should ultimately result in the best projects being developed and connected to the electricity system, delivering lower energy costs for consumers once the projects are built.

[54] Section 3A(1B) of the EA89

[55] Section 3A (2)

2.204. The TMO4+ reform package proposes to align the connections process with the CP2030 Action Plan by restricting which projects can receive a grid connection agreement to those which are within the capacity ranges specified for each technology type in the CP2030 Action Plan.

2.205. Restricting the connections queue in this way introduces the risk to competition in the market and places landowners, communities, and local authorities in a powerful position when negotiating with projects. This could ultimately result in increased construction costs for projects and, therefore, higher electricity prices for consumers compared to the status quo. However, we do recognise the benefits to competition of a smaller pool of higher quality (viable and ready) projects competing with each other to progress quickly.

2.206. The counter-risk under the status quo is that renewable generation projects must enter a CfD auction corresponding to a date equal to or later than their grid connection date, meaning that the inability to move connection dates forward are a limiting factor on CfD competition in the present system.

2.207. We assess the impacts on key areas of competition in the Wider Impacts section below (Wider impacts 85).

Economic Growth

2.208. Section 108 of the Deregulation Act 2015 requires Ofgem to have regard to the desirability of promoting economic growth. In particular, Ofgem must consider the importance of promoting economic growth by exercising its regulatory functions in a way that ensures that regulatory action is taken only when needed and that any action taken is proportionate.

2.209. Grid connections, and specifically connections delays, are increasingly becoming a blocker to investment in new industrial and commercial sites, as well as the electrification of existing industrial sites.

2.210. Demand users seeking a connection to the transmission system would not have any capacity limits as part of the proposed TMO4+ connection process. Therefore, all demand demonstrating sufficient land rights would be eligible to receive a Gate 2 connection offer.

2.211. By removing both demand and generation projects that are not ready from the queue, as well as generation projects which do not align with the expected needs in the CP2030 Action Plan, capacity will be released for projects which can accelerate, and overall, we would expect connection dates to be accelerated.

2.212. Speeding up connection dates is also expected to enable demand customers, such as data centres and steel works, to be progressed at a faster pace, thereby contributing to faster economic growth.

2.213. In exceptional circumstances, demand projects that are critical for system operability or materially reduce system constrains may also be designated and subsequently prioritised for connection, as per the proposed Project Designation Methodology. Demand projects cannot be prioritised at this time solely on the basis of growth, although we may look to explore this further with the Government and NESO.

2.214. Additionally, investment in building renewable generation and storage projects contributes to economic growth. Accelerated connection dates for ready renewable generation and storage projects can deliver investment more quickly, contributing towards a faster rate of economic growth compared with status quo.

2.215. The TMO4+ reform package would give a strong signal to developers about where to invest and would reduce the amount of money tied up in securities for projects that are not ready or not needed, allowing this money to be invested or used elsewhere, encouraging economic growth (Risk of abortive network works' section).

2.216. In its CP2030 Action Plan, the Government outlined the many ways that clean energy industries supported by the plan will contribute to economic growth[56], including:

- Generating new jobs through domestic manufacturing and services, with investment in domestic supply chains.
- Creating job opportunities in locations across Great Britain, particularly coastal regions for offshore windfarms.
- Preserving our energy intensive industries in a decarbonised economy.
- Ensuring low electricity costs, allowing investor to invest with confidence, knowing they will not be subject to the volatility of fossil fuel prices.

[56] Clean Power 2030: Action Plan: A new era of clean electricity

Wider impacts

2.217. In this section, we assess the likely wider impacts of connections reform, in line with our statutory duties.

Competition

2.218. As referred to above (p.2.201), the status quo connection process does not support competition, as developers are assigned a queue position on a first come first served basis, without taking into consideration any other relevant factors such as readiness or alignment with strategic system plans.

2.219. The TMO4+ proposes to align the connections process with the CP2030 Action Plan, which would restrict which projects can obtain a grid connection based on their alignment with the capacity ranges in the CP2030 Action Plan. However, by restricting capacity of projections with a connection agreement to those that meet the strategic alignment criteria, TMO4+ could reduce the number of projects competing in the market and hence in the CfD and Capacity Market auctions.

2.220. To avoid impacting projects that are already well advanced, the proposed TMO4+ reform package would protect any projects that have been awarded a CfD or Capacity Market contract at the point of the Gate 2 to Whole Queue exercise, such that they would be included in the reformed connections queue, provided they have met the Gate 2 Readiness Criteria.

2.221. We explore the impacts on competition in CfDs and Capacity Markets in more detail below.

Impacts to competition in the CfD

2.222. CfDs are contracts that give revenue certainty to renewable generators by guaranteeing a price for the electricity they generate and is the primary route to market for renewable generation in Great Britain. Generators with a CfD contract have their revenue topped-up when market prices are below their agreed price for electricity (strike price) and pay-back additional revenue when market prices are above the strike price. CfDs are funded by consumers.

2.223. Auctions are carried out annually, where renewable generators compete in technology pots against other renewable generators to bid the lowest strike price.

2.224. Auctions close when either the Government's budget or target procurement capacity has been met, with all winning generators receiving the highest of the winning strike price bids.

2.225. A planning permission is pre-requisite for entering a CfD auction. A connection agreement with a connection date is also required to enter a CfD auction[57], therefore we have assumed that a Gate 2 agreement would be required in future.

2.226. The 'readiness' criteria in the Gate 2 Methodology would be unlikely to impact on the number of projects entering CfD auctions, as planning permission required to participate in a CfD auction generally comes later than obtaining land rights in a project's development lifecycle. We, therefore, do not expect this to have an impact on the competitiveness of these auctions.

2.227. However, the 'strategic alignment' criteria, and the consequent restriction of the Gate 2 queue to those projects that meet these criteria, do risk reducing competition in these auctions. This is because a Gate 2 offer would be required to enter a CfD auction, and there would necessarily be fewer such agreements than the current number of connection agreements in the existing queue. Less competition in the auction could result in a downward pressure on strike prices, which could, in turn, lead to higher CfD clearing prices, and ultimately higher cost of electricity for consumers.

2.228. However, TMO4+ rules would protect any existing projects with a connection where planning permission was sought before 20 December 2024 and granted prior to the closure of the gated application window. The next CfD auction round, called allocation round 7 (**AR7**), is expected to take in place in the summer of 2025. It follows that projects eligible to compete in AR7 are likely to be the ones that are protected within TMO4+. Therefore, we do not think that TMO4+ would have any negative impacts on the number of participants in the AR7 auction.

2.229. When NESO consulted the industry on the Connections Methodologies for the reformed connections process[58], respondents raised concerns about the negative impact of the connections reform proposal to align the connections queue with CP2030 Action Plan pathways on the effectiveness of future CfD and Capacity Market auctions, arguing that including all 'ready' projects, rather than

[57] Schedule 5: Application checks to be carried out by the Delivery Body

[58] Connections Reform | National Energy System Operator

restricting to those that meet the strategic alignment criteria, would increase competition in those auctions and therefore deliver better outcomes for consumers.

2.230. For future allocation rounds, such as AR8 (expected 2026) and AR9 (expected 2027), there is a risk that restricting the connections queue could negatively impact the competition within these auctions.

2.231. However, there are several risk-mitigations for this within TMO4+ proposals:

- NESO has proposed to use the highest capacity from the capacity ranges specified in the Government's CP2030 Action Plan, meaning that more capacity would be issued a Gate 2 grid connection agreement than would be needed in any one scenario from the CP2030 Action Plan. This is a result of using the higher of the CP2030 Action Plan capacity ranges, protecting projects exceeding capacities, and having more capacity holding connection agreements with a connection date earlier than 2030 than is needed to deliver 2030.
- Having more capacity with a connection date prior to 2030 than is needed to achieve clean power by 2030 means that these projects would need to compete for support, for example CfD and Capacity Market capacity, as not all of them will be needed.
- We understand that more projects than are needed for 2030 (i.e. more than in the CP2030 Action Plan 2025-2030 capacities) would receive connection dates up to 2030 as an outcome of the 'Gate 2 to Whole Queue' exercise. Therefore, we anticipate more capacity will be eligible for CfDs, with a connection date prior to 2030 than will be needed to achieve clean power by 2030. This will retain competition in CfD markets, as there will be more eligible projects to compete than would be needed to deliver.
- When filtering the queue based on CP2030 Action Plan alignment, NESO will order projects based on their planning status.[59] This means that the projects most likely to be eligible to compete in future CfD auctions would be more likely to have a Gate 2 connection agreement, thereby mitigating the risk that projects eligible and likely to compete in a given CfD auction are moved to Gate 1.

[59] CNDM Section 5.7 Aligning the queue to the CP2030 Action Plan

- As per the licence changes consulted on by Ofgem, NESO would be obligated to review the Connections Methodologies at least annually to assess whether any changes are required. In addition, Ofgem would have the power to trigger a review of the Connections Methodologies at any point. These provisions would enable quick interventions to be made in the event there were significant risks emerging to competition. For example, if there was evidence that competition was impacted, one possible solution could be to increase the amount of capacity eligible to receive a Gate 2 agreement by adding capacity to the CP2030 Action Plan capacities.

2.232. It is also important to consider that renewable generation projects must enter a CfD auction corresponding to a date equal to or later than their grid connection date. Therefore, under both the status quo and TMO4+ connections process, connection dates are the limiting factor for which projects can enter a CfD competition.

2.233. If TMO4+ delivers faster connection dates for the Gate 2 projects that remain in the queue, it is also possible that there could be greater competition in CfD auctions.

2.234. It is important to note that the consideration of impacts above is based on the CfD design and auction frequency remaining the same as it is today. However, it is possible that these factors could change in the future, potentially altering the impacts discussed.

Impacts to Capacity Markets competition

2.235. The Capacity Market offers generators, electricity storage and demand-side response payments in return for capacity being connected and delivering energy at times of system stress. Potential providers of capacity market services secure the right to receive capacity revenues by participating in a competitive auction process which sets the level of Capacity Payments.

2.236. Similar to CfDs, users must meet minimum eligibility requirements, including having a valid grid connection agreement and planning permission, to participate in the Capacity Market.

2.237. The next Capacity Market auction is in March 2025, and will issue capacity market contracts for the period 2025/26 (T-1 auction) and 2028/29 (T-2 auction). Connections reform would not impact on the competitivity or results of this auction, as the implementation of TMO4+ would occur after this auction. Any projects successfully in the auction would be protected and remain in the connections queue.

2.238. The dates of the following Capacity Market auction are yet to be announced, but we anticipate it will take place in early 2026, with prequalification taking place in late 2025. As planning permission is required to enter a Capacity Market Auction, and projects with planning are protected in TMO4+, we do not expect the following Capacity Market Auction to be significantly affected.

2.239. NESO's consultation on the Connections Methodologies also addressed the potential impact of capacity reallocation. Some respondents set out that the impact of reservation on existing projects should be carefully considered to avoid disadvantaging those already in the queue.

Environmental impacts[60]

2.240. The TMO4+ reform package would have an impact on the electricity generation mix used in Great Britain, thereby directly influencing carbon emissions from electricity generation.

2.241. Due to the uncertainty surrounding the potential generation mix from the current queue of projects in the status quo, and the exact generation mix that will emerge from the different CP2030 Action Plan scenarios, quantification of the difference in carbon emissions between the status quo and CP2030 Action Plan has not been calculated. Instead, we qualitatively assess the likely outcomes on carbon emissions of TMO4+.

2.242. TMO4+ would align the current connections queue with the capacity needs specified in the CP2030 Action Plan. DESNZ expect that delivering a clean power system would reduce the carbon intensity of electricity generation from 171gCO2e/kWh in 2023, to well below 50gCO2e/kWh in 2030, which is well within the Climate Change Committee's Carbon Budget 6 advice.[61]

2.243. If the status quo was maintained, there would be a significant risk that the clean power by 2030 would not be achieved, making the ultimate goal of net zero by 2050 more difficult and costly. Furthermore, if a sub-optimal technology mix was connected, it would likely to lead to increased need for gas generation to manage security of supply and system operability issues.

[60] The environmental impacts of the proposal are considered specifically in this section and throughout this Impact Assessment, in accordance with section 5A(4)(a) Utilities Act 2000.

[61] Clean Power 2030: Action Plan: A new era of clean electricity, page 25.

2.244. By contrast, if TMO4+ is approved, it will be a key enabler of delivering low-carbon generation, therefore making it considerably more likely that the clean power by 2030, and ultimately net zero by 2050, will be achieved.

2.245. In addition, TMO4+ would restrict which generation and storage projects can connect to and use the electricity transmission system based on whether or not those projects meet the Gate 2 readiness and strategic alignment criteria. Aligning the generation and storage pipeline to the CP2030 Action Plan will streamline the process of network planning and enable network companies to better co-ordinate and more efficiently plan the network. More co-ordinated siting of generation and storage is expected to result in reduced need for new network build to achieve Clean Power by 2030, thereby lowering the impact on the wider environment caused by the construction of new infrastructure.

2.246. Overall, it is expected that TMO4+ will result in positive environmental impacts.

Impacts on investor confidence

2.247. The GB energy sector must compete globally for investment. It is crucial that GB provides an attractive environment for investment to ensure that there is enough development and financing to meet its energy needs and carbon emissions reduction obligations.

2.248. The status-quo does not give investors certainty, due to many compounding deficiencies in the system (see Problem under Consideration section):

- The scarcity of existing grid capacity and size of the existing queue to connect, means that there is no certainty for investors on where and when there will be network capacity for them to connect to. Connection dates being offered for new projects are into the 2040s, meaning investment would not be delivered for a long time, if at all.
- For holders of connection agreements, the slow pace of network delivery and the regulatory regime for network companies mean that there is lack of certainty that their connection date will be met, and a lack of recourse for developers if their connection date is missed.
- Network companies have low certainty as to which projects will be progressed to completion and when, due to low barriers to entry in the current connections process.

2.249. These three issues need multiple policy interventions to be resolved (such as those contained in the TAAP, CAP, and the E2E review). However, the TMO4+ proposals to filter the connections queue based on readiness criteria and to align

the connections queue with the CP2030 Action Plan would give a strong signal to developers about whether projects are needed or not, which we expect would have a positive impact on investors' confidence.

2.250. Aligning with the Government's CP2030 Action Plan would ensure that the connections queue, and the network build required to deliver that queue, is compatible with the Clean Power by 2030 and net zero goals, and the policies being put in place to deliver this. In our view, this would deliver more certainty for projects seeking to connect, therefore positively impacting on investors' confidence in the long term. In addition, the inclusion of the 2035 pathway in the CP2030 Action Plan provides a 10-year planning horizon and hence longer-term investment clarity for investor and developers.

2.251. In response to a policy consultation on Connections Methodologies, generators have signalled that alignment with long term planning (beyond 2030) would provide investment certainty, which is seen as a benefit of strategic alignment.

2.252. We believe investors and developers will have more trust in connections contracts that are awarded in line with strategic energy system plans due to co-ordination of policy and industry efforts to deliver these plans. This benefit will manifest over time in increased investment for viable projects and the faster progression and capital spend on projects needed in strategic plans compared to the status quo.

2.253. However, we also acknowledge the perceived risk for well progressed projects in meeting the strategic alignment criteria and the negative impact this may have on investors' confidence.

2.254. To protect projects and investments that are well developed, TMO4+ will allow any existing project with planning permission, an awarded Capacity Market or CfDs contract to retain their connection agreement. However, there is a risk that if TMO4+ is approved, there would be short term uncertainty while the Gate 2 evidence is being assessed and until updates to connection agreements are completed in Q4 2025-Q1 2026. This uncertainty could lead to a hiatus in investment in new and existing projects for close to 1-year, which could jeopardize the achievement of the 2030 targets.

2.255. Introducing a restrictive connections process could reduce the investor appetite, particularly if investors do not have confidence that their connection agreement will be honoured. This reduction in competition among investors to develop projects could put net zero targets at risk and increase the costs of electricity.

2.256. On balance we think that rationalisation of the connections queue is necessary to ensure that networks have the certainty needed to rapidly expand network build and the rate of connections. We also believe it is important that developers know where to invest in generation and storage, and that this investment is aligned to the CP2030 Action Plan and other strategic plans. Our view is that the impact this will have on investor confidence in the short term is mitigated by NESO protections and outweighed by the increased investor confidence that will come in the long term from projects that are aligned to the CP2030 Action Plan, and the policies introduced to ensure that the plan is delivered.

2.257. We will closely monitor the impacts on investor confidence and will act quickly, using the regulatory framework introduced by TMO4+, if investor confidence is damaged to such an extent that achieving Clean Power by 2030 is put at risk.

Impact on innovative technologies and hybrid technologies

2.258. The status quo grid connections process does not consider the technology types connecting to the system when allocating capacity, queue position or connection dates.

2.259. TMO4+, by introducing the strategic alignment criteria, would restrict the number of technologies that can receive Gate 2 grid connection contracts depending on the capacities specified in the CP2030 Action Plan.

2.260. Hybrid projects (projects made up of two or more generation and storage technologies sharing a grid connection) are not considered separately in the CP2030 Action Plan, therefore NESO will assess these projects based on the technology capacities for the individual technology types comprising the hybrid project, and on the type of connection agreement they are seeking.[62]

2.261. Battery energy storage built as part of a hybrid project can utilise the network in different ways to standalone battery capacity, even if it imports from the network. There is a risk that applying the TMO4+ rules, which assume that hybrid battery energy storage with an import would operate the same as standalone batteries modelled in the CP2030 Action Plan, would not accurately account for the impacts these projects have on the system, including their benefits. The TMO4+ could therefore prevent certain innovative business models and hybrid project configurations from being developed.

[62] Section 5.11 Connections Network Design Methodology (CNDM).

2.262. This risk would be somewhat mitigated by NESO's ability to designate projects that are innovative.

2.263. As per the licence changes consulted on by Ofgem, Ofgem would have the power to trigger a review of the connection methodologies, and NESO would be obligated to review the connection methodologies at least annually to assess whether any changes are required. The risk to innovation, particularly for hybrid projects, is an area where monitoring and review may be needed in future.

2.264. If a hybrid project containing energy storage wishes to import power from the network, the energy storage capacity must be aligned with CP2030 Action Plan capacities for energy storage. If, however, the hybrid project only wishes to export power, only the generation capacities will contribute to the CP2030 Action Plan capacity.

2.265. The Government's CP2030 Action Plan does not cover all technologies that might connect to the electricity network. The following technologies exist within the current connections queue but are not in scope of the CP2030 Action Plan:

- Wave generation
- Tidal generation
- Non-GB generation (ie generation located outside of Great Britain's territorial waters)
- Demand

2.266. Technologies that are not included in the CP2030 Action Plan, will not have any restrictions on the capacity or location that can connect (strategic alignment criteria (d)[63]). We therefore do not see any negative impact of TMO4+ reforms on these emerging technology types compared with maintaining the status quo.

2.267. For future technologies that are not currently in the queue or in the CP2030 Action Plan, project designation could be used to enable these technologies to receive a grid connection.

[63] Section 6.3 Gate 2 Methodology.

Impact on demand projects

2.268. The TMO4+ reform package will apply to demand projects directly connected to the transmission system. Distributed connected demand will not be subject to the TMO4+ but will be impacted by the effects the reforms will have on the wider network.

2.269. Under the reformed connections process, demand projects would have several benefits, which could potentially result in sooner connection dates for these projects.

2.270. All demand projects are out of scope of the CP2030 Action Plan and therefore will automatically be deemed to have met the strategic alignment criteria. If they meet the readiness criteria, they will be placed in the Gate 2 connections queue. This means that demand projects are less restricted, and providing that they can demonstrate that they are ready to connect, will be able to join Gate 2. As demonstrated throughout the Impact Assessment document, Gate 2 will be a smaller queue than the status quo, and therefore will result in capacity being released on the network, which could be utilised by demand and lead to quicker connection date. This is also true for network capacity at distribution.

2.271. Demand projects could also be eligible for project designation and therefore could be prioritised within the Gate 2 queue formation. This would be contingent on demand projects demonstrating significant system benefits, as set out in the Project Designation Methodology. In response to the policy consultation on the Connection Methodologies, some demand users raised the importance of the prioritisation of demand projects, particularly of demand projects deemed as providing significant benefits to industrial strategy, such as data centres.

2.272. Potential disbenefits to demand projects under TMO4+ may arise from the introduction of application windows, which may be seen as restrictive due to specifying time periods in which users can apply. However, by having batched application windows, demand projects will benefit from a more efficient application process.

2.273. Overall, it is expected that TMO4+ will have positive impacts on demand projects seeking to connect compared to the status quo.

3. Uncertainty and associated risks

3.1. As recognised throughout this Impact Assessment, there are inevitable limitations in the projections and data currently available, including those highlighted below. We are welcoming views on the detailed package and will consider any further information and stakeholder feedback before making a final decision.

Data on the current queue

3.2. We have used transmission queue data provided by NESO. Users are not currently obligated to supply NESO with evidence of their current readiness status; therefore, the readiness status of users is based on data NESO collected from the RFI and additional research of available planning data sets. A description of the analysis undertaken by NESO when assessing queue date can be found in the NESO impact assessment report[64], and their Impact Assessment Databook[65].

3.3. We acknowledge that the data provided by NESO is on a best endeavours basis, and although we know there are limitations in the data provided, we believe it is the best data available at this time.

3.4. Data on the capacity of the queue and the readiness status of projects at distribution is based on data supplied to Ofgem by individual DNOs. Data on user readiness reflects the capacity of users who have met the relevant queue milestone and submitted evidence to the DNO. Users are not required to submit evidence to the DNOs when they meet a readiness Milestone but rather, only prior to their Milestone date, therefore this data may be out of date and under-represent the number of users who have met a readiness Milestone. However, as with NESO data we accept that this data was provided on a best endeavour basis, and believe it to be as an accurate a representation of the connection queue as is available at this time.

Estimating the queue resulting from reforms

3.5. In our assessment of the new queue, we have not estimated what additional capacity will be granted consent or obtain land rights before TMO4+ would be implemented in 2025, if approved. We have presented a range for the size of the

[64] https://www.neso.energy/document/350256/download

[65] https://www.neso.energy/document/350356/download

new queue based on available data, which has certain limitations as recognised above. In particular, due to projects progressing between this assessment and implementation of reforms, the queue is likely to contain more protected and more ready projects than presented in this Impact Assessment.

3.6. There is also an inherent uncertainty in how capacity in the Gate 2 queue would be allocated to the regional transmission and distribution CP2030 Action Plan capacities by NESO. This is because NESO has the ability in the Connections Methodologies to re-balance zonal capacities to account for under and oversupply resulting from protected projects, that is, those that meet strategic alignment criteria irrespective of alignment with CP2030 Action Plan capacities. In our higher estimate of the queue size, we have assumed that NESO will not carry out any zonal balancing. This is unlikely to be the case and likely represents an overestimation of the queue size post implementation of reforms.

Estimating impact on network and date accelerations

3.7. NESO and network companies carried limited assessment of potential accelerations to connection dates as a result of TMO4+. This is because connection dates are dependent on a number of different factors, including the readiness status of individual projects; the list of projects meeting Gate 2 criteria (readiness and strategic alignment); network reinforcement requirements; and interdependencies of network reinforcements.

3.8. We have therefore had to rely on case studies provided by the TOs to gain a sense of the types of accelerations which may be possible, and worked on the reasonable assumption that by releasing capacity held by not ready or not needed projects, this capacity will in many cases be useable by other projects in the queue (currently holding a later connection date), which would result in an acceleration for the project.

3.9. TOs did not include power system modelling as part of their case-study analysis due to the timescales associated with the urgent nature of these reforms. Power system modelling will be integral to the implementation of reforms and only after this modelling has been carried out, will the impacts on network build and customer connection dates be fully understood.

3.10. There is however a risk that network modelling carried out by the TOs post implementation does not result in significant accelerations. This may be particularly true for connections pre-2030, where projects and network reinforcements are already progressing to completion.

Costs

3.11. The primary risk to consumers is the risk of costs for abortive works carried out by the TOs. Although we believe NESO (alongside the TOs) have produced a reasonable estimate of the works which are more likely to be abortive, this estimate could in theory be significantly higher than the upper estimate given, albeit we think this outcome is unlikely. The reason for this is that we would expect the majority of projects moved to Gate 1 to be those projects which have yet to progress significantly, and are more likely to have later connection dates, require more network reinforcement which TOs will not have begun to spend significant sums on. Network reinforcements associated with more progressed projects with sooner connection dates are more likely to have had TOs spend significant sums on these works, however we think the projects associated with this network reinforcement are less likely to be moved to Gate 1 and even if they were, we would expect the network reinforcement would be more easily re-used by other Gate 2 project.

3.12. The primary benefit to consumers comes via delivery of the CP2030 Action Plan, which we think TMO4+ will better enable than the status quo. We have not carried out energy system modelling of the CP2030 Action Plan pathways or calculated the cost benefits of the CP2030 Action Plan. This is not the purpose of this impact assessment.

3.13. Instead, we have assumed that the benefits of the CP2030 Action Plan pathways and the modelling presented in NESO advice and Government's plan is accurate, following a multi-month analysis and development process carried out by NESO and Government, with support from TOs and DNOs. The purpose of this impact assessment is to assess the NESO connections proposals against our statutory objectives, and the objectives stated in the CAP.

Impact on individual projects and customers

3.14. This Impact Assessment has assessed the likely aggregate impacts of TMO4+. The readiness status of individual projects is not known with certainty at the time of assessing these impacts, meaning we do not know exactly which projects would meet the readiness criteria.

3.15. As readiness status (planning status) is a key determinant of whether or not a project will meet the Gate 2 strategic alignment criteria, we therefore do not know for certain which projects will be in Gate 2.

3.16. This means that we have not been able to assess the precise impacts TMO4+ will have on specific projects / companies. Reforms could result in financial loss and impact for these projects, which we have considered but not assessed by reference to specific projects.

3.17. In our consultation questions we are seeking information on how TMO4+ proposals would impact your project or portfolio of projects specifically.

4. Monitoring and Evaluation

Section Summary

This section sets out our plan to monitor and evaluate the impacts of our minded-to decision to approve NESOs TMO4+ proposals, including our expectations for future reviews of the connections process in future.

4.1. Although we expect these reforms to provide a significant overall benefit and improve the certainty and speed of connection for all in the long run, we recognise there will be a reduction in some developers' prospects of being connected at the place and time they currently anticipate – and that ultimately some developers with existing projects who apply for a Gate 2 confirmed offer will receive only a Gate 1 offer with an indicative connections date. Investments always carry risk, including the risk that the law and regulation around them changes; in the context of the TMO4+ reforms, we are seeking to help investors manage that risk by being as clear and transparent in our decision-making process as possible. That is one of the reasons these reforms have been through an extensive process of open development over the past year, and, through this consultation, we continue to seek to provide as much transparency and opportunity for comment as possible.

4.2. We also want to be transparent about the inevitable limitations in the projections and data currently available. For the reasons set out in these consultation documents, based on the information available we are presently minded considering that approving this package of reforms is the course which best serves the objectives of the connections reform process and which best aligns with relevant statutory objectives and duties.

4.3. If, following this consultation, we approve the reforms, we will continue to monitor the emerging information and impacts closely. We are particularly mindful of the uncertainties about attrition rates in Gate 2 and the opportunities that will provide for those in Gate 1; as well as the outturn impacts on Solar projects. This package contains various mechanisms by which adjustments can be made, including the opportunity for at least annual changes to the Connections Methodologies (subject to consultation and approval). Given the existence of those mechanisms and considering that it takes multiple years to develop generation projects, and many years to plan and build new network

infrastructure , we are confident that there is sufficient flexibility to course-correct if and as required in order to maximise the impact of the reforms in achieving their objectives and minimise any adverse or unexpected consequences. However, we would be grateful to receive any feedback on this, including further steps which may help balance overall certainty with targeted flexibility.

4.4. Below is our draft Monitoring and Evaluation strategy, should we approve TMO4+.

4.5. We would measure the success of TMO4+ by looking at the level of progress against the following:

- A Connections queue in 2026 with enough capacity to achieve Clean Power by 2030 capacity targets set out in the CP2030 Action Plan.
- More capacity with connection agreements with a connections date pre-2030 than is needed by 2030 per the CP2030 Action Plan.
- Acceleration (compared to their current dates, pre-TMO4+ reforms) in connection dates for projects receiving a Gate 2 offer.
- Increase in the capacity connected annually by network companies.
- Steady rate of applications to connect for undersupplied technologies in the queue
- Projects progressing through queue management milestones at rate required to achieve Clean Power by 2030

4.6. We would monitor and evaluate the above success criteria for both distribution and transmission separately as well as the combined, to gain a holistic understanding of the impacts of TMO4+.

4.7. We would closely monitor for any emerging un-intended consequences of TMO4+ including:

- High abortive network costs
- Reduction in investor confidence, evident through projects not progressing through queue management milestones even if they have a Gate 2 contract.
- Offered connection dates being delayed
- Insufficient capacity with connection dates pre-2030 to achieve Clean Power by 2030

- Lack of projects being developed and applying for connection to fill undersupplied capacity buckets
- Actual connection rates not increasing or meeting the required rate to hit Clean Power by 2030
- Reduced competition in relevant markets.

4.8. When monitoring and evaluating impacts during implementation we would work and engage with key stakeholders including, NESO, Network Companies, Developers, and utilise existing industry forums to monitor and report on impacts such as CDB, CPAG, SGC and the Implementation Hub.

4.9. We would collect initial evidence after NESO has closed the Gate 2 to whole queue evidence window and assessed evidence in July 2025. We will gather evidence on updated connections offer dates in Q1 2026.

4.10. As per proposed licence conditions governing Methodologies, NESO are required to review the connections methodologies at least once per year. We expect NESO to carry out the first review of the connection's methodologies in April 2026 include an initial impact of the assessment of TMO4+.

4.11. We will carry out an Impact Evaluation in 5 years time, in 2030.

5. Next steps

5.1. This Impact Assessment relates to and is subsidiary to 'Consultation: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment' which invites responses to questions on connections reform proposals by 14 March 2025, including our conclusions in this Impact Assessment.

Appendices

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Appendix 1: Transmission Network Operators Impact Assessment

National Grid Electricity Transmission ("NGET")

Approach

5.2. NGET have assessed the impact of readiness criteria using NESO's RFI data and subsequently layered on the additional impact of applying strategic criteria to align with the Clean Power 2030 Action Plan.

5.3. NGET's approach was to: (i) identify the enabling network reinforcements needed for the current queue and assess the impact of removing projects that are now unlikely to meet the new readiness criteria; (ii) use two case studies to model impact of applying readiness criteria on connection dates; and (iii) model the impact on the network of applying the CP2030 Action Plan capacity pathways in addition to readiness criteria.

5.4. The potential for acceleration from the removal of projects is dependent on the relative queue position of removed project(s), the connection dates, the size of the connecting project(s), the location, how each project interacts with other projects and the network as a whole, and any investment decisions that might be affected.

5.5. The data below was captured from NGET internal records on 14/01/2025 and is subject to change.

Impact on queue size and composition

5.6. Based on RFI data (51% of queue response rate) and internal network understanding, NESO's RFI indicates 461 NGET contracted customer projects would meet Gate 2 readiness criteria, however 286 of these would be removed as not required for CP2030.

5.7. Therefore, 175 projects out of the 611 RFI respondents are predicted to remain in the reformed queue.

5.8. Across their network, NGET estimate there may be shortfalls of capacity in 2 regions on the basis of customers that responded to NESO's RFI: 300MW shortfall of onshore wind to 2030 targets in T8 region, and 700MW shortfall of solar to 2035 targets in T3 region. However, it is expected that these shortfalls

can been made up with ready but not strategically aligned projects in adjacent regions in accordance with the process proposed in the CNDM.

Effect on enabling works

5.9. NGET has over 700 live non-attributable enabling reinforcements.

5.10. When both readiness and strategic alignment criteria are applied, NGET identified 185 non-attributable reinforcements that no longer have any associated connections. In comparison, if the readiness criteria were applied in isolation, it is likely that only 27 of these enabling reinforcements would no longer have any associated connections

5.11. NGET estimate that the reduction in projects not meeting CP2030 alignment equates to a 39% reduction in general Enabling Works capacity identified to be associated to RFI respondents. The impact of removing or adapting the 185 reinforcements would result in up to £4.7 billion of costs avoided.

5.12. The rest of the Enabling Works needed for customer projects within the RFI that do meet Gate 2 are estimated to be around £20.6bn, which means TM04+ would result in a reduction of reinforcements needed of up to 20%.

5.13. It is important to note that £4.7 billion represents a potential avoided cost, this cost may never materialise in full or in part in the status quo, if projects self-terminated from the queue prior to the construction of these works. Equally, subsequent analysis of the network during implementation may also show that some or all these network reinforcements may still be required if TMO4+ is approved.

Effect on connection dates and substations

5.14. NGET estimate that up to 532 (out of 774) unique contracultural connection substation[66] sites would be impacted by TMO4+, with about two thirds of those substations projected to have no connections. These substations are mixture of existing substations and planned substations. Spare capacity at existing substation may still require additional works before projects can connect to them, e.g. substation extensions.

[66] Substation in this context considers the voltage as well as the location. Therefore, a substation operating at two voltages will have been counted as two substations

5.15. NGET have provided two substation case studies, by identifying substations with a high response rate from NESO's RFI to the number of active customer projects (according to internal records).

5.16. However, once strategic alignment criteria are applied, in one case study, acceleration could be possible for a party waiting to connect at that substation, and in the second example, the queue at the substation is reduced to one project meaning capacity available for use by other projects, or alternatively, a review of whether this substation is needed and therefore costs avoided. In another case study, based on readiness alone, it showed limited scope for acceleration of other projects.

5.17. The case studies also demonstrate that capacity could be freed up for ready and needed projects which apply to connect in future, and which could be connected more quickly compared with if they had applied in future under the status quo. This is an important benefit, as currently applicants are waiting until the late 2030s for a connection date on account of the insufficiently advanced projects (such as those in the case studies) ahead of them in the queue taking up substation bays i.e. it might no longer the right thing to build a substation of the same size and scale as is currently featured in customer contracts

Scottish Power Transmission ("SPT")

Approach

5.18. Scottish Power Transmission (SPT) have considered the RFI responses alongside their internal RIIO-T3 Load Planning data to assess the likely impacts of the proposed TMO4+ reforms on their network.

5.19. Analysis to assess the impact on Connections Dates is based on a subset of Enabling TORIs (transmission owner reinforcement instructions) which are on a connection offers' critical path (the 'critical path' being the Enabling TORI with the latest energisation date) and four case studies based on interactivity queues, both as proxies for SPT's wider network.

5.20. Where there is more than one TOCO (transmission owner construction offer) behind the Enabling TORI on the critical path, this represents a 'queue' along which a TOCO could be accelerated.

Impact on queue size and composition

5.21. SPT have assessed the number of projects in their transmission area that are likely to meet readiness criteria to be 270 projects with a capacity of 47 GW. 147 projects with a combined capacity of 22 GW would meet strategic alignment

criteria and readiness criteria. Applying both readiness and strategic alignment criteria is estimated to result in 328 projects receiving a Gate 1 offer with a combined capacity of 54.8GW.

5.22. SPT's network area is heavily dominated by batteries, onshore Wind and hybrid generation and battery projects. Batteries capacity is likely to exceed the CP2030 Action Plan regional capacity significantly, just by protected projects. Solar CP2030 Action Plan regional capacity is likely to be met by ready projects, but this is dependent the number of projects that meet the strategic alignment criteria via a relevant protection. Overall, there is not expected to be a significant undersupply in technologies in SPT network area.

Impact on Connection Dates

5.23. SPT have assessed which TOCOs could potentially be accelerated through two methods as proxies for the wider network: consideration of Enabling TORIs and four case studies based of interactivity queues. They considered 209 enabling TORIs for 249 Associated TOCOs. Of These TORIs, 107 are Enabling TORIs which are a TOCOs critical path. Of these, 44 Enabling TORIs are the critical path for more than 1 TOCO, i.e. there is a queue. Note, this does not account for cases where a project has been offered a point of connection at another substation, as a result of that substation being full.

5.24. When applying readiness criteria alone, 161 TOCOs. associated with the 209 Enabling TORIs, meet Gate 2 readiness criteria. Of those, only 6 projects are behind another project of the same tech with the potential to be swapped out and accelerated.

5.25. When applying CP2030 strategic alignment criteria, 106 TOCOs, associated with the 209 Enabling TORIs are CP2030 aligned. Of those, only 2 projects are in a queue behind another project of the same technology type with the potential to be swapped out and accelerated.

5.26. Therefore, the number of opportunities for projects to be accelerated is extremely limited due to project connection dates being mostly driven by local works.

5.27. SPT provided four case studies demonstrating the impact readiness and CP2030 alignment criteria would be expected to have on the queue at substation level and the potential for acceleration of customer connection dates in these queues.

Effect on enabling works

5.28. SPT have analysed Enabling TORIs with >500MW of TOCO capacity associated with them and the proportion of this capacity which has met Gate 2 Readiness criteria (land option only).

5.29. When readiness criteria are applied to the existing queue, all but three of these Enabling TORIs are still enabling customer connection.

5.30. If this is increased to include projects that align with CP2030, the number of TORIs which would no longer be classed as enabling for customer connections increases to 25.

5.31. CP2030 alignment reduces the TOCO capacity associated with Enabling TORIs and reduces the number of TORIs which will be classified as Enabling. However, Scottish Power caveat that it is impossible to determine prior to studying the network as part of the Gate 2 to Whole Queue exercise if these TORIs will be classified as Wider Works and still required.

SSEN Transmission (SSEN-T)

Approach

5.32. Similarly to the other network companies, SSEN-T Transmission (SSEN-T) have used data provided by the NESO RFI combined with internal data to draw assumptions on the likely effects of TMO4+. SSEN-T estimate that this combined data set would represent over 90% of its connections pipeline.

5.33. For schemes not included in the RFI data set, the following assumptions were made:

- Schemes that have progressed as far as submitting a planning application meet the readiness criteria (applies to approx. 36% of the pipeline capacity)
- Schemes that are consented as of January 2025 will be 'grandfathered' a Gate 2 connection offer.

5.34. When assessing the impact of TMO4+ on Enabling Work TORIs, a TORI was considered 'impacted' if it was enabling works for a scheme that would not meet Gate 2. The 'impact' was calculated as a percentage of the total TEC (Transmission Entry Capacity (MW)) of generation schemes enabled by the TORI.

Impact on queue size and composition

5.35. SSEN-T analysis of the queue indicated that they are likely to reach the CP2030 Action Plan regional capacity for 2035 for all technologies, with the exception of solar.

5.36. Their key findings indicated that the largest capacity was removed from battery projects, but by number of schemes, onshore wind was most impacted.

Effect on connection dates

5.37. SSEN-T provided 2 case studies to demonstrate the potential for acceleration of connection dates.

5.38. In one case study, 12 generators in one area of the network were given Gate 1 offers because they did not meet the criteria for Gate 2. This could therefore allow for other customers in the area to potentially have their connection dates accelerated. Determining the impact of this on accelerating connection dates and the need for enabling works would however require further detailed power system analysis and assessment of the possibility of accelerating delivery of enabling works, which the timescales associated with this Impact Assessment did not allow for.

5.39. This case study demonstrates the complexity and interdependence network reinforcement have on each other and the broader pipeline of projects in the connections queue. It also emphasises the need for detailed power systems analysis and deliverability to understand the full implications of these changes. As such, when projects drop out and are no longer connecting, it is not always straight forward to determine whether others can accelerate, as the impact depends on multiple factors within the wider network, requiring detailed power systems analysis.

5.40. In the second case study, 6 schemes were linked to the same TORI, which involved upgrading Super Grid Transformers (SGTs) at a substation. Of those 6 projects, 3 were found to not align with strategic alignment criteria, 1 was anticipated to be 'grandfathered' and therefore likely to move forward, and the two remaining schemes could not be matched to any response to the RFI, leaving their status unknown.

5.41. This case study shows that the Transmission Entry Capacity (TEC) associated with this TORI would likely reduce by 91.6%. This reduction in TEC demand could result in accelerations for other customers or reduce the reinforcement work needed subject to delivery timescales, saving time and resources.

Effect on enabling works

5.42. SSEN-T-T currently has 132 TORIs that serve as enabling works for schemes in the queue and the RFI. Of these, 117 would be impacted by the application of the Gate 2 criteria in TMO4+, with 38 of these TORIs being fully impacted – meaning the full capacity associated with them would not be affected because the projects they were enabling would not meet Gate 2 requirements.

5.43. The notional investment value of these 38 reinforcements is £2.35bn. If TMO4+ were implemented, this investment would no longer be required at this time, potentially representing avoided network cost.

5.44. Currently £2.07 billion of these costs are attributable, meaning that generation and storage user driving the need are liable for the costs, however £0.28 billion are non-attributable, meaning the liability for these costs prior to completion are shared between developers and consumers, and the capital costs once built would be recovered via network charges (the relative split in recovery from generators and consumers unknown at the present time).

5.45. SSEN-T anticipates that TMO4+ will be highly influential where investment is required to accommodate customer connections. 'Connection only' TORIs have historically posed a significant challenge in demonstrating investment confidence and securing regulatory funding.

5.46. The new TMO4+ processed, aligned to CP2030 provides a higher level of certainty for the 'connection only' TORIs.

Appendix 2: Comparison of queue to CP2030 Action Plan Capacities

Figure 16: Comparison of the queue of solar projects in each transmission zone to CP2030 Action Plan capacity targets (GW)

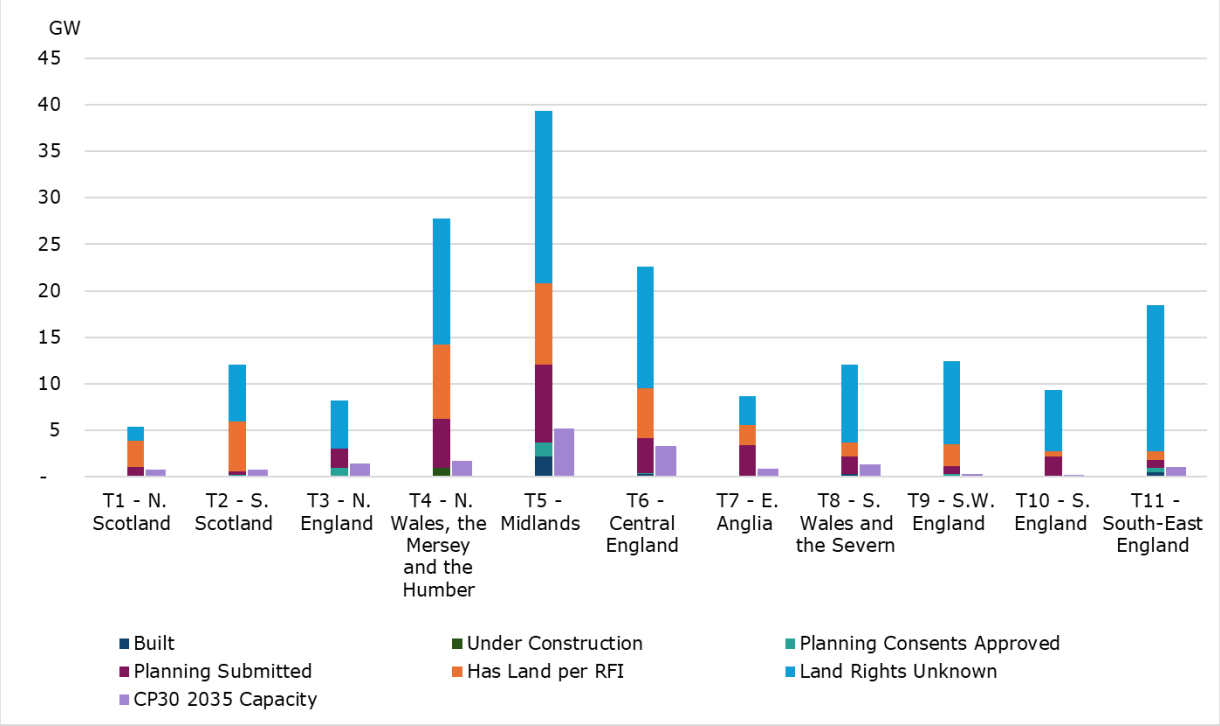

Figure 17: Comparison of the queue of battery projects in each transmission zone to CP2030 Action Plan capacity targets (GW)

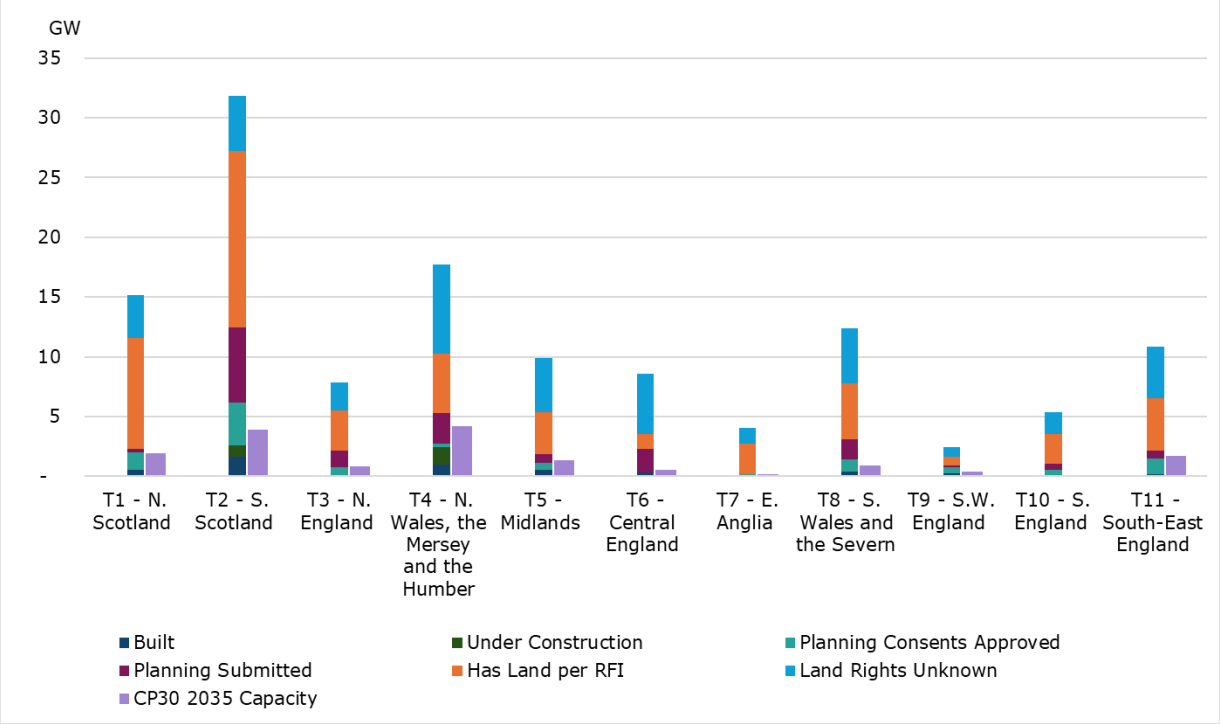

Figure 18: Comparison of the queue of solar projects in each distribution zone to CP2030 Action Plan capacity targets (GW)

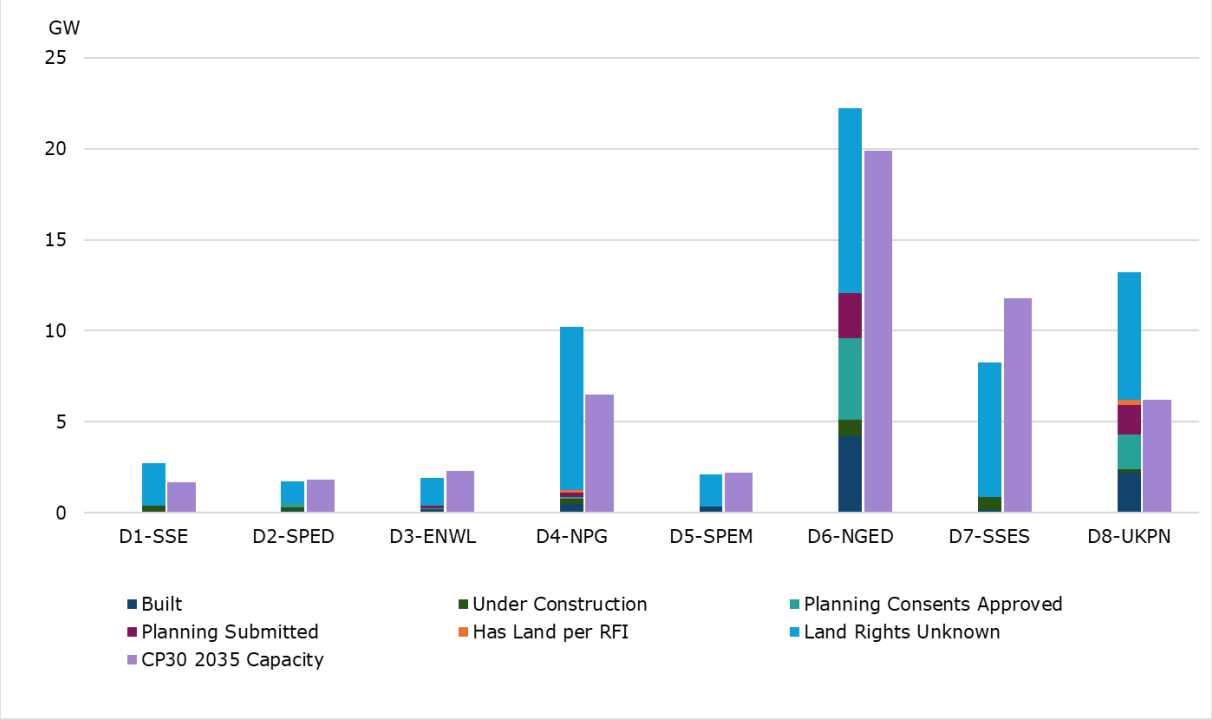

Figure 19: Comparison of the queue of battery projects in each distribution zone to CP2030 Action Plan capacity targets (GW)

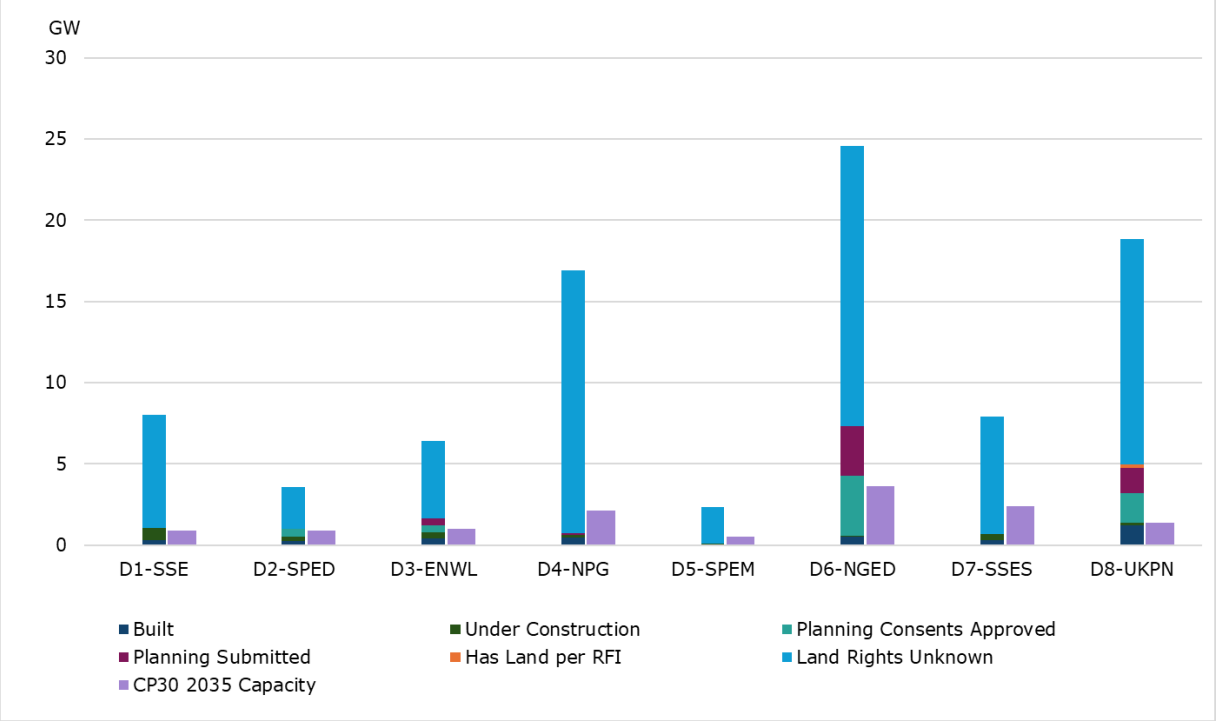

Figure 20: Comparison of the queue of onshore wind projects compared to the national targets in CP2030 Action Plan capacity targets (GW)