Impact Assessment

TMO4+ Impact Assessment

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This document is part of our[1] decision 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 Criteria Methodology, Connections Network Design Methodology, and Project Designation Methodology. We have also issued a decision on changes to licences to enable the TMO4+ reform package to be implemented. The TMO4+ reform package is a new connections process that will apply readiness and strategic alignment criteria to the existing connections queue, and to future applicants. It will also introduce a new batched application and offer process.

This document sets out 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 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 Criteria Methodology, Connections Network Design Methodology, and Project Designation Methodology.

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1. Introduction

Section summary

This section examines the current state of the connections process, defines the problems besetting it and how the current shortcomings present a rationale for an intervention and, from this, sets out the scope of this Impact Assessment.

Final Decision

1.1. This document sets out the assessment of the impacts of our decision to approve TMO4+ following a consultation on our minded-to positions on the TMO4+ reform package, published between 14 February 2025 and 14 March 2025.[3]

Problem Under Consideration

1.2. 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 on the date they accept their connection offer.

1.3. Action has been taken over the last two years to address the oversubscription of the connections queue. However, the influx of very large numbers of new projects seeking connections, combined with Government's Clean Power 2030 (CP2030) mission, mean that fundamental reform of the connections process is urgently needed to accelerate the rate of connections, to support cost-effective delivery of the CP2030 Action Plan, and to support growth. This has resulted in the development of the TMO4+ reform package.

1.4. The current connections process is presenting the following four problems:

- **Unrealistic connections queue**: The connections queue now contains far more generation capacity than is required to achieve Clean Power by 2030 and net zero by 2050 or is likely to progress to

[3] Consultation on connection reform (TM04+) enablers, including a statutory consultation on modifications to licence conditions | Ofgem

connection and would likely eventually be terminated under their current contractual position.

- **Queue misaligned with Clean Power and Net Zero**: The current queue, assuming all projects were to connect, contains an over-supply in all technologies, with a significant oversupply of easier-to-develop technologies, such as batteries, and solar in specific regions, compared to the capacities in the CP2030 Action Plan. However, some technologies are at risk of being undersupplied and the current connections process will not effectively enable the right mix of projects to be connected in time for CP2030 and beyond.
- **Unclear network build signal**: Under the current process network companies must plan for all connection works. With the size of the connections queue, this level of build is not feasible or efficient to deliver or accelerate. In practice, networks recognise the risk that a proportion of projects will not ultimately connect, but have considerable uncertainty for networks regarding what they should build and when.
- **Reduced investor confidence**: New connection offers are well into the late 2030s, materially delaying possible future investment. For projects already in the queue, there is therefore an existing, escalating risk that the dates projects hold could be delayed due to being unachievable.

Unrealistic connections queue

1.5. As of February 2025, there were 765GW worth of projects holding connection contracts across the transmission and distribution network - 587GW at transmission and 178GW on the distribution network[4]. This far exceeds what is estimated to be needed for Great Britain (GB) to achieve Clean Power by 2030[5] or to be on track for net zero by 2050.[6]

1.6. As shown in Figure 1 below, the volume of new connection applications (including new applications and modification applications) to the network

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

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

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

received by the NESO and distribution networks has increased significantly over the last five years, albeit not all these are subsequently accepted by the applicant. Across transmission and distribution, 233GW of new connection applications were made in the 2019/20 financial year, compared to 444GW of new connection applications made in the 2023/24 financial year.

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

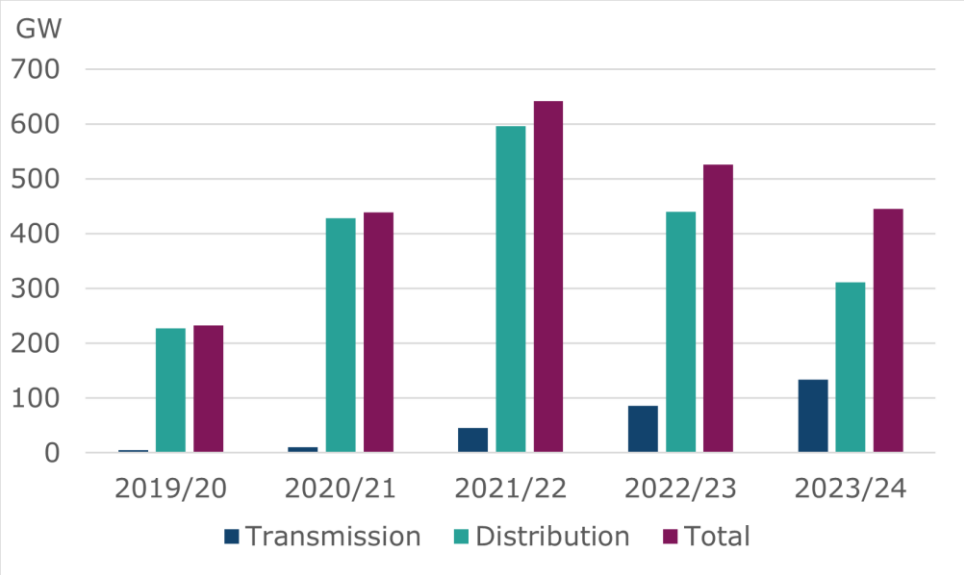


Table 1: Capacity of total new connection applications received each financial year (GW)

	2019/20	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Transmission	5.27	10.36	45.26	86.07	133.24
Distribution	227.68	428.55	596.10	439.30	311.18
Total	232.95	438.91	641.36	525.37	444.41

1.7. Within Table 1, 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 2528%.

1.8. Modification Applications (i.e. applications to vary connection contracts) have made up an increasingly significant proportion of connection applications to the transmission network (31% in 2023/24).

1.9. Figure 2 and Table 2 below show a breakdown of the different types of applications received by NESO each year, including Modification Applications. Types of applications presented in the figure and table are as follows:

- Statement of Work (SOW) – a new application for a Distribution-connected generation connection subject to assessment for potential impact on the Electricity Transmission System.[7]
- Modification Application – an application seeking agreement to vary an existing connection contract.[8]
- Project Progression Application – an application submitted by a Distribution Network Operator (DNO) to NESO following a SOW to determine technical competency.
- New Connection Application – a request for a new connection to the Transmission system.

[7] In the form set out in Exhibit U to the CUSC.

[8] In the form set out in Exhibit I to the CUSC.

Figure 2: All applications received by NESO for connections each financial year (count)

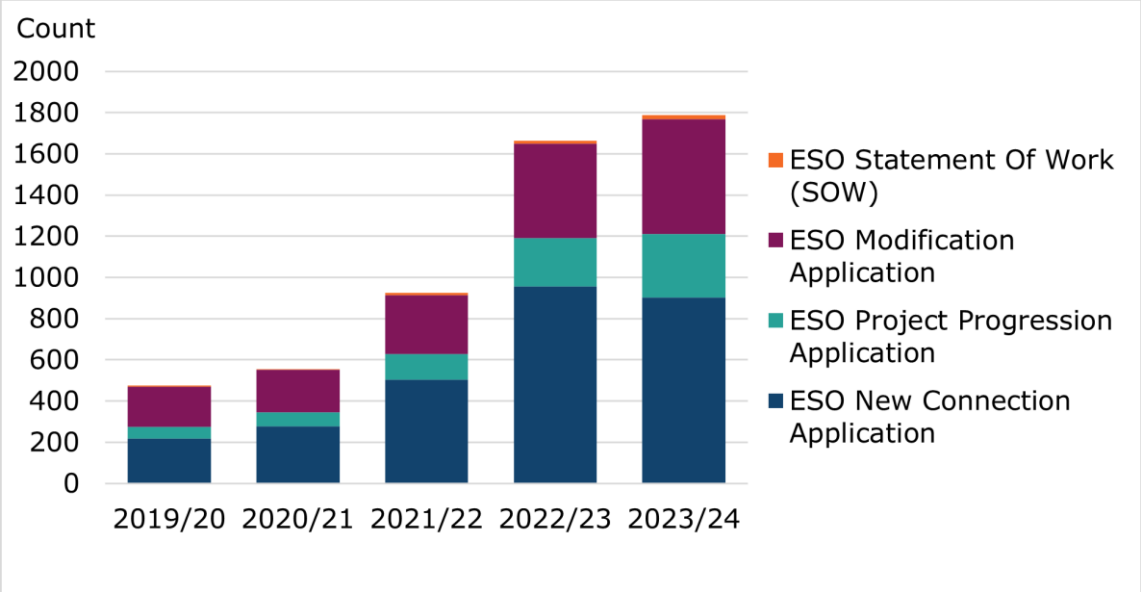


Table 2: All applications received by NESO for connections each financial year (count)

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, projects that have a place in the queue and then modify their connection agreement to move their project connection to a later date, have the effect of preventing other projects that would have been able to connect at that earlier date and in that place, from being able to do so; the network build and planning required means that projects which could have been connected earlier cannot do so even when an earlier project moves it connection date back.

1.12. Figure 3 and Table 3 below show 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

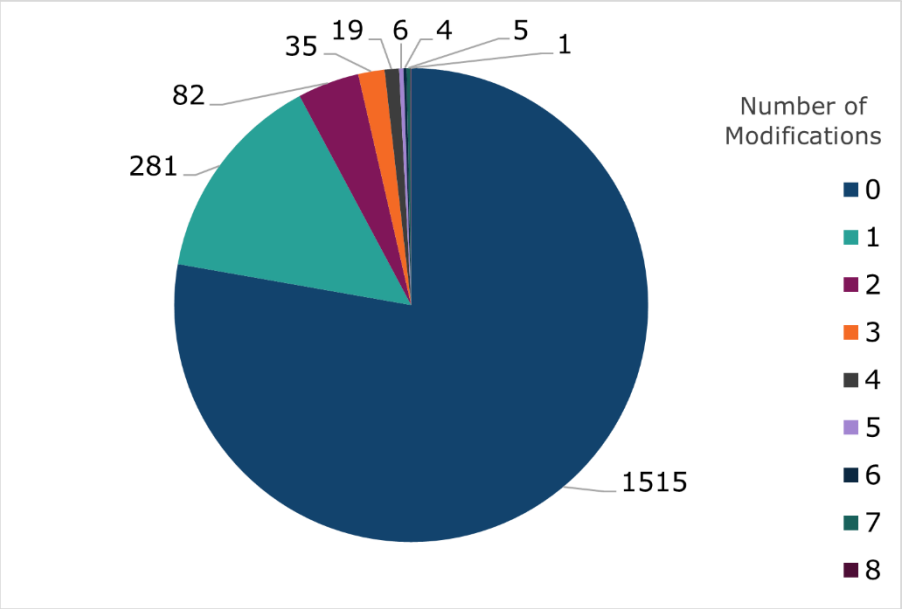


Table 3: Number of modifications applications associated with all Transmission Connections agreements in the current queue

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

1.13. 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 far in the future were potentially being blocked from connecting by projects that were holding capacity in the queue and not progressing. NESO (then NGESO) published the Case for Change for GB Connections Reform in December 2022[9]. However, the number of applications for connection of transmission projects continued to increase year on year, despite efforts to improve the connections process.

1.14. The initial 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,[10] disincentivising the seeking of a later connection date.

1.15. In May 2024, prior to the deadline where Queue Management Milestones took effect, there was a spike in modification applications (167) compared with the 24/25 year to date monthly average (72). We infer that the reason for this spike to be that many projects modified their agreements to avoid having Queue Management Milestone dates placed into the current connection dates in agreements, which they may 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.

1.16. Figure 4 and Table 4 below show 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.

[9] GB Connections Reform Case for Change.

[10] 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)[11]

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

1.17. 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: (i) network company uncertainty as to which projects are progressing, which affects network build; (ii) projects blocking ready projects from progressing, which risks impeding the

[11] This data is correct as of December 2024.

achievement of Clean Power by 2030 and; (iii) risks to investment across generation and demand.

1.18. 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, albeit we note at this time that there is a temporarily pause on new applications in the queue.

Misalignment of queue with CP2030 Action Plan

1.19. Government's CP2030 Action Plan[12] 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.[13] In delivering the CP2030 Action Plan, we, and Government, recognise the paramount importance of finding the most cost-efficient route possible to protect the interests of consumers.

1.20. Considering the current grid has 123GW[14] of connected capacity, we will not need the majority of the capacity in the current queue to achieve Clean Power by 2030 or to be on track to deliver net zero by 2050[15].

1.21. Figure 5 and Table 5 below show the current queue for generation projects with connection dates in 2030 or earlier, compared to the maximum of the 2030 permitted 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.

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

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

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

[15] 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 CP 2030 Action Plan

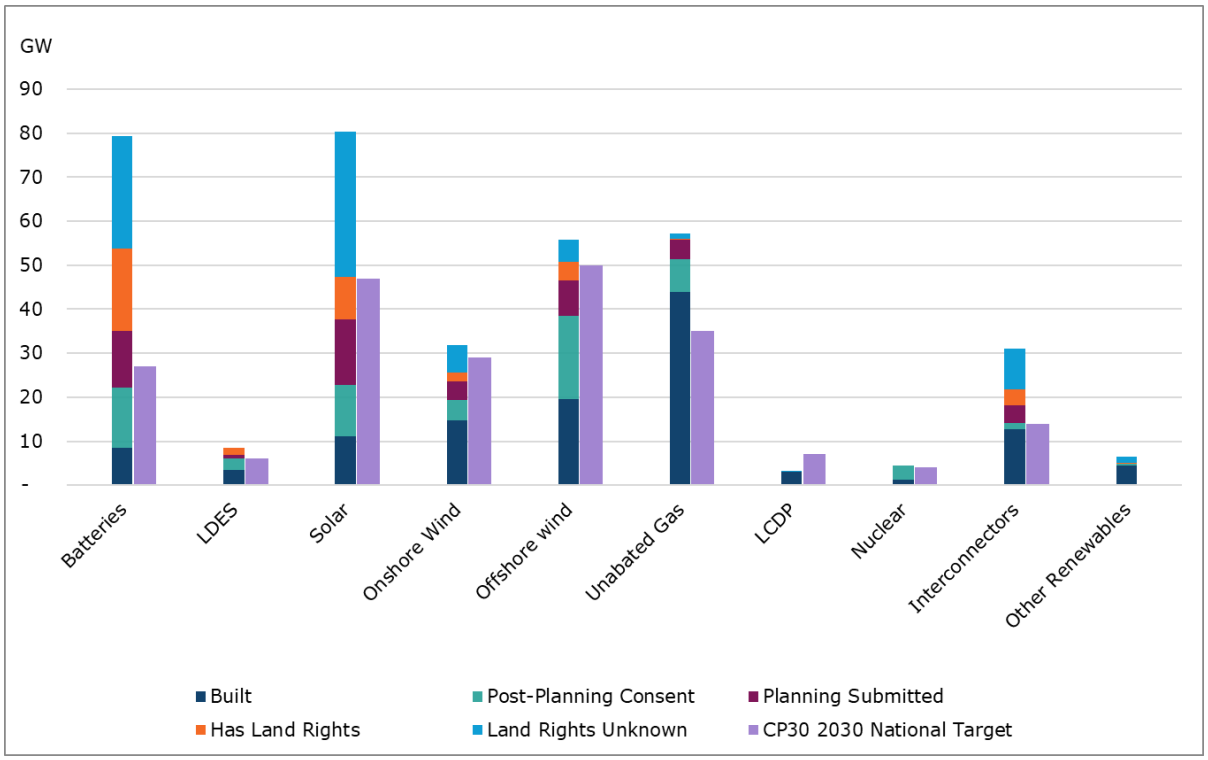


Table 5: Capacity of the Full Queue compared to the maximum capacity for 2030 as needed in CP2030 Action Plan

Technology	Built	Post-Planning Consent	Planning Submitted	Has Land Rights	Land Rights Unknown	CP30 2035 National Permitted Capacity
Batteries	8.4	13.7	12.9	18.9	25.5	27.0
LDES	3.4	2.6	0.9	1.5	0.0	6.0
Solar	11.2	11.7	14.8	9.7	33.0	47.0
Onshore Wind	14.7	4.8	4.2	2.0	6.1	29.0
Offshore wind	19.6	18.8	8.0	4.3	5.1	50.0
Unabated Gas	44.0	7.4	4.4	0.3	1.1	35.0
LCDP	3.1	0.0	0.0	0.0	0.0	7.0
Nuclear	1.2	3.3	0.0	0.0	0.0	4.0
Interconnectors	12.7	1.4	4.0	3.6	9.3	14.0
Other Renewables	4.5	0.5	0.0	0.0	1.5	0.0
Total	122.7	64.2	49.3	40.3	81.6	219.0

1.22. Figure 6 and Table 6 below show the current queue out to 2035, compared to the maximum of the 2035 permitted capacities. As with 2030 permitted capacities, there is sufficient capacity per technology in the queue out to 2035. It shows demonstrable significant over-supply for batteries and solar with many of these projects not expected to be progressed.

Figure 6: Capacity (in GWs) of the queue split by readiness and planning status compared to the maximum capacity for 2035 in CP2030 Action Plan

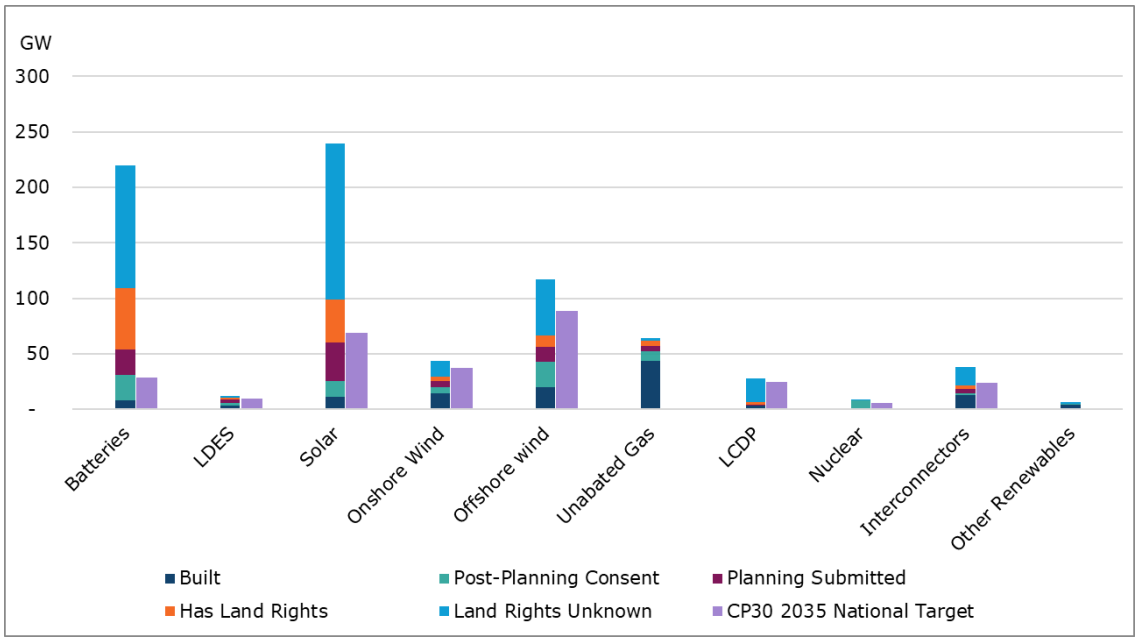


Table 6: Capacity (in GWs) of the queue split by readiness and planning status compared to the permitted capacity for 2035 in the CP2030 Action Plan

Technology	Built	Post-Planning Consent	Planning Submitted	Has Land Rights	Land Rights Unknown	CP30 2035 National Permitted Capacity
Batteries	8.4	22.3	22.9	55.6	110.7	28.7
LDES	3.4	2.6	2.7	1.5	1.6	10.0
Solar	11.2	14.2	34.8	38.8	140.2	69.4
Onshore Wind	14.7	5.1	5.9	3.9	14.4	37.0
Offshore wind	19.6	23.5	13.1	10.5	50.1	89.0
Unabated Gas	44.0	8.5	5.0	4.8	2.4	0.0
LCDP	3.1	0.0	0.9	2.3	21.6	25.0
Nuclear	1.2	6.7	0.0	0.0	0.9	6.0
Interconnectors	12.7	1.4	4.0	3.6	16.7	24.0
Other Renewables	4.5	0.5	0.0	0.0	1.8	0.0
Total	122.7	84.7	89.3	121.0	360.5	289.1

1.23. However, whether there is sufficient generation for all technology types in the queue for 2035 materially changes if projects in the queue will not be ready to connect. Even with projects that potentially ready, there is over-supply for some technologies compared to the regional and zonal capacity requirements set out in the CP2030 Action Plan.

1.24. 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 with regards to technology composition. As set out in the Introduction 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.

1.25. The CP2030 Action Plan sets out the Secretary of State's view of the types of projects that are likely to be needed for 2030 and 2035 in order for the carbon budget and net zero to be met as required by the Climate Change Cat 2008. The data above demonstrates that some needed technologies are already at high risk of being blocked.

Unclear network build signal

1.26. The NESO and Network Companies are required to assess the impact on the network of every connection application. For the projects in the current connections queue to be connected would require an unfeasibly significant expansion of the electricity system. 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.[16] To meet these connection dates - assuming that all of these projects were delivered which we know is not the case as set out above - Transmission Operators Owners (TOs) would have to connect users at a rate of 42.6GW per year, approximately five times the 5-year historical average of 8GW for transmission connections. At this historical rate, it would take TOs circa 27 years to connect all the pre-2030 capacity currently contracted for.

1.27. Historic data[17] (ie the percentage of projects that hold a connection agreement but subsequently do not connect) projected to show that between 30-40% of projects who accepted offers would actually connect. This shows that this projected network build requirement is very unlikely, but it is unknown to the Network Companies which projects will eventually connect. The milestone data above suggests projects will exit too late to helpfully inform network decision-making.

1.28. Accordingly, planning and delivering network build for the entire current queue would involve significant wasted costs. Moreover, connecting all the projects in the connections queue would be far in excess of what is needed to 2035 in the CP2030 Action Plan. Accordingly, the network build required to accommodate the whole queue would be unfeasible and would involve significant wasted costs. If projected readiness is taking into account, in

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

17 In 2022, NESO analysed 9 years' worth of TEC register data

addition to the wasted network build, it is unlikely that the mix of technologies would deliver the capacities required to accommodate the CP2030 Action Plan. All of this creates significant uncertainty which is inefficient and damaging for both public and private investment.

1.29. Network companies must currently plan to deliver a network that matches the connections queue, despite knowing that the capacity in the queue is significantly larger than needed and potentially different in terms of the necessary technology mix. The NESO and network companies are therefore faced with trying to determine what network will actually be required based on assumptions as to which projects will ultimately connect. Necessarily, their determination will not be wholly accurate and, therefore, leads to inefficient use of network resources. Further, to avoid such waste, we hear anecdotally that network companies, both distribution and transmission, wait for users to demonstrate progress to completion before moving ahead with significant investment in the network, which contributes to delays in network build.

1.30. As shown in Figures 7 and 8 below, the rate of total (distribution and transmission) new connection 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 year.

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

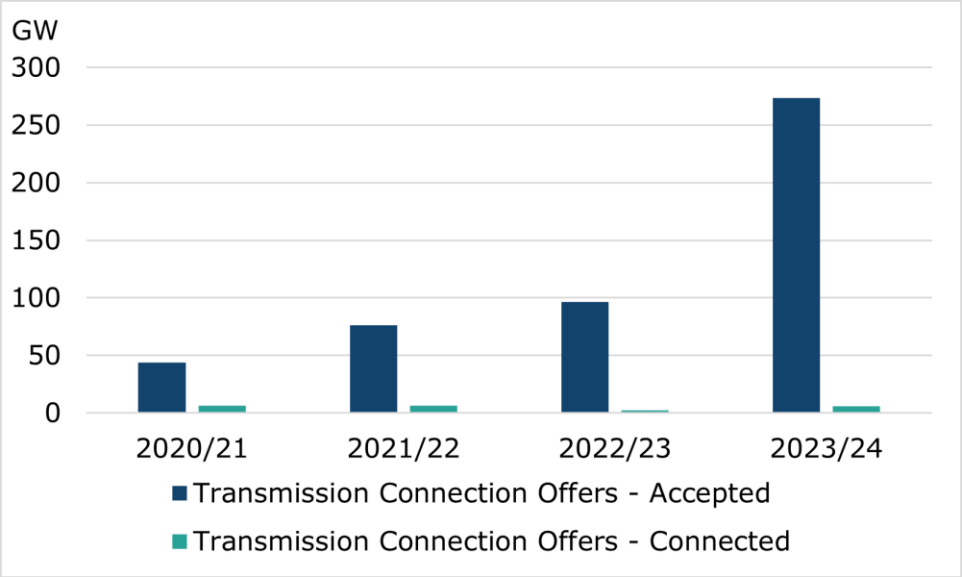


Table 7: Capacity of Transmission connection offers that are accepted vs connected each financial year (GW)

	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)

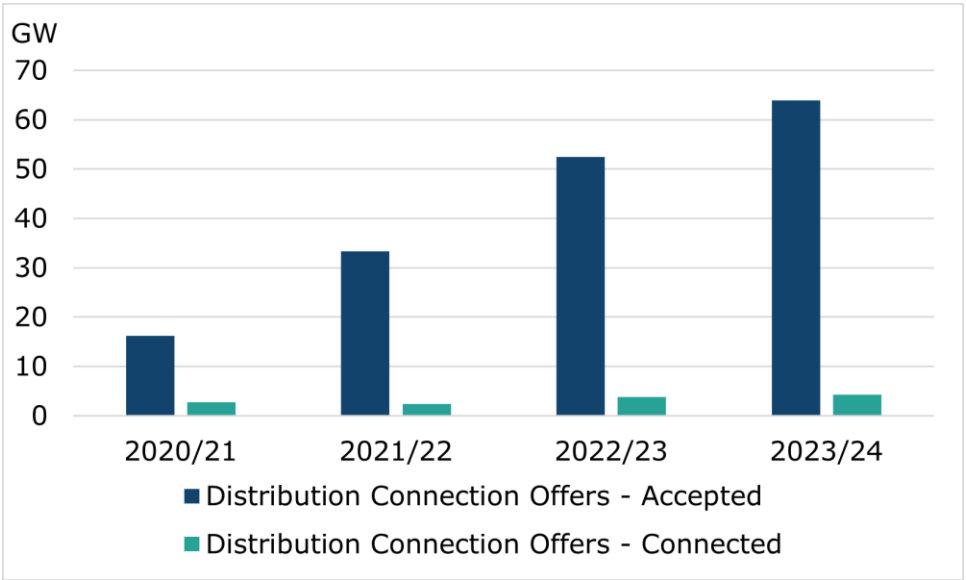


Table 8: Capacity of Distribution connection offers that are accepted vs connected each financial year (GW)

	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

1.31. 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.

1.32. 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 show the number of years, on average, that projects in the transmission queue will wait until under the status quo for their respective connection dates.

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

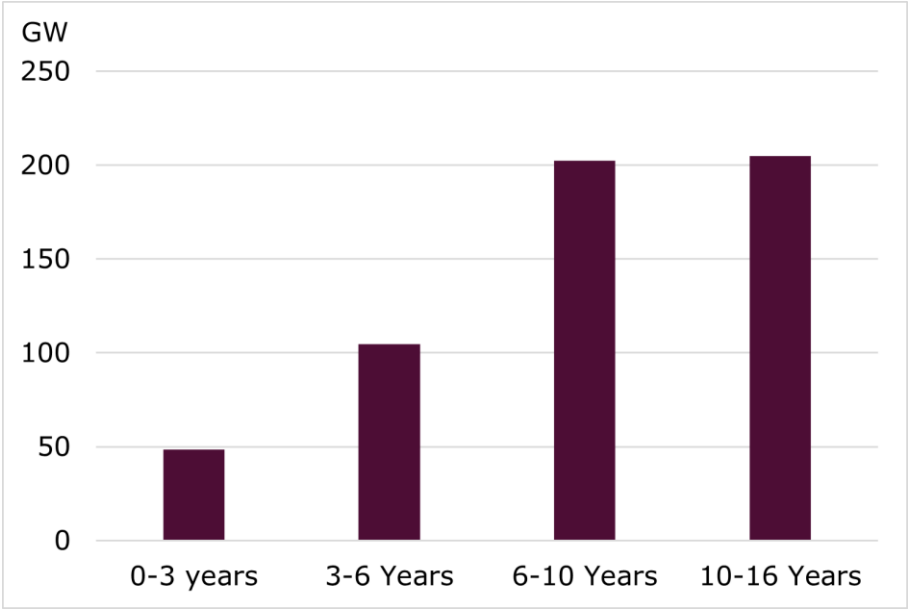


Table 9: Capacity of projects in Transmission queue by the number of years until their connection dates (GW)

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

1.33. 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.

1.34. 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.

1.35. Connecting parties see the delays to connection dates as a result of the need for significant grid reinforcements. Developers of renewable generation and storage may seek connection agreements as early as possible in their development process to try to secure a grid connection with a reasonable connection date. These projects may not ultimately connect due to being insufficiently progressed, and may then ask to amend their offer or eventually drop out, albeit this behaviour is less likely now due to Queue Management Milestones in place at both distribution and transmission. This has led to growth of the connection queue which is preventing projects ready to connect from connecting sooner. 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 unilaterally 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

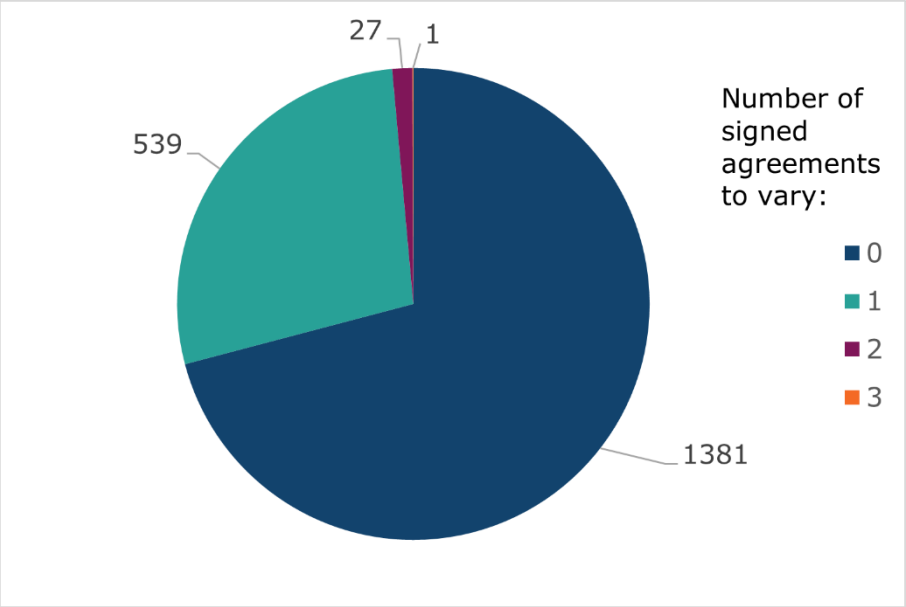


Table 10: Number of Signed Agreements to Vary associated with all Transmission Connections agreements in the current queue

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

1.36. 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 subjected to change by network companies due to highly challenging assumptions on the actual network build, which in turn increases investor uncertainty.

1.37. 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[18]per annum on average between 2025-2030 up from the 8GW average annual rate for the six years up to April 2025 across transmission and distribution[19]. Achieving this will require action in multiple areas, delivering increased network build through network price controls and tougher obligations ensuring this delivery.[20] The critical enabler for this will be the connections process in providing networks with a clear, credible pipeline of projects to connect.

Reduced Investor Confidence

1.38. All of the issues outlined above are described primarily in terms of simply maintain the current timetable for queue connections. Trying to accelerate would still further intensify all of these challenges.

1.39. 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 limits routes for new projects, significantly delaying or deterring investment.

1.40. Projects within the queue are also experiencing increasing 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.

1.41. Whilst this impacts generation and storage projects, from the perspective of the consumer the consequences are most serious when they impact a specific project that would be materially more beneficial to the energy system (due to its technology and/or location) than projects ahead of it in the queue.

1.42. For demand, the delays impact key energy consumer and thus key contributors to economic growth. Access to the electricity networks is a key requirement for almost all major infrastructure projects, including

[18] 219GW capacity required for 2030 minus 119 GW built capacity, to be delivered over the next 5 years.

[19] ENA Monthly T&D data book

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

generators, energy storage, and electricity consumers such as factories, data centres, hospitals, and housing developments.

1.43. For users seeking a demand (non-generation or export) connection to the transmission system, for example, for projects to drive decarbonisation or economic growth (eg industrial sites or data centres), delays to grid connections for businesses could divert investment entirely to other countries, having a negative impact on economic growth. For example, 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)[21], 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.[22]

1.45. Ofgem oversees the regulatory regime for connections. Please see the document entitled 'Summary Decision: TMO4+ Connections Reform Proposals – Code Modifications, Connections Methodologies & Impact Assessment' where we outline the actions that we have taken to date and why further intervention is now needed to the connections process to 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.

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

[22] Deregulation Act 2015.

Scope of Impact Assessment

1.46. As set out above, TMO4+ requires changes to industry codes (CMP434, CMP435, CM095), licences (NESO, Transmission, Distribution) and the introduction of new Methodology documents (Gate 2 Criteria 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.[22] 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,[23] complies with these obligations 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 impacts.

1.48. This Impact Assessment considers the likely impacts of the reforms and to the extent possible, the impacts are quantified.

1.49. Using the data referred to in the below sub-section, we have estimated the likely size and technological make-up of the connections queue by approving TMO4+. The process followed and assumptions made in this process is explained in more detail in the section called 'Impacts on the size and makeup of the queue'.

1.50. 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 called 'Impact on network build and connection dates'.

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

1.52. Where costs to networks and NESO have been identified, we have relied on estimates of these costs from NESO and network companies (see below in 'Key data sources used' sub-sections). We consider this to be reasonable approach given the high level of information NESO and particularly network companies have regarding potential network costs. Consideration of costs can be found in sections called '*Risk of abortive network works'* and '*Cost of "Gate 2 to whole queue" exercise'*.

1.53. 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**) and Connections end-to-end review of the regulatory framework. Therefore, any impacts of TMO4+ are also dependent on the broader policy objectives of TAAP, CAP, and the CP2030 Action Plan being delivered.

1.54. TMO4+ reform package proposes that the connections process aligns with the CP2030 Action Plan. This Impact Assessment does not assess the impacts of Government's CP2030 Action Plan save insofar as it feeds directly into the content and impact of the reforms.

1.55. However, we recognise that precise quantification is not possible.

Key data sources used

1.56. This Impact Assessment is informed by the published Impact Assessment carried out by NESO[24] as well as assessments produced by the Transmission Owners for Ofgem, consultation with DNOs and responses to the NESO Connection Methodologies consultation.

1.57. In addition, this Impact Assessment is further informed by responses to our own consultation on the TMO4+ reform package (held between 14 February 2025 and 14 March 2025) and our two consultations on the licence changes to enable TMO4+.

1.58. To assess the impacts on the size and scope of the queue we have relied upon the CP2030 Action Plan (as updated in April 2025) technology capacities published by Government. We have relied on data provided by the NESO in their Impact Assessment and underlying data on the transmission queue, which incorporates TEC register data and responses to a Request for Information (RFI). For the distribution queue, we have relied upon data provided directly by the DNOs.

1.59. In this final assessment, following helpful feedback we have also undertaken a sensitivity check of our assessment on battery, solar and onshore wind projects using publicly available data published by Regen.[25]

1.60. To better understand the status of the projects in the connections queue, NESO issued a RFI to developers on 28 May 2024[26]. This was followed up with a second RFI in September 2024 targeted towards non-respondents of the first RFI.

Limitations of data

1.61. Ofgem recognises that there are limitations on the completeness and accuracy of the data used, including because some of it is likely to have changed by the time of any implementation and because of the interdependency of the proposals with other policies and reforms. However, because of the urgency and strategic importance of the proposals Ofgem considers that by applying different scenarios, as part of its predictive exercise, the data is sufficient for it to reach reasonable conclusions on likely final impacts. Where we have made assumptions, we have stated where and what these are.

1.62. 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.

1.63. Through the process of making our decision on the TMO4+ reform package, it is natural to expect the data we use to underrepresent the readiness status of projects as projects will naturally progress between data collection, decision and implementation. Therefore, it is inevitable that projects will progress through the development pipeline with more projects progressed to planning consent in the time since the data was compiled and the decision date.

1.64. This data is therefore likely to be the best reflection Ofgem can obtain of projects in the queue that are projected to move to Gate 2 and potential wasted build costs. Thus, 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.

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.

Background and Context

2.1. Since publishing our original Impact Assessment alongside our minded-to consultation on TMO4+ connection reforms proposals, we have updated our analysis to account for changes to data and to make some minor corrections. These include:

- Updates to the analysis of solar to account for the update to CP2030 Action Plan permitted capacities.
- Correction of Ratcliffe-on-Soar project capacity and technology type.
- Correction of D1 and D7 distribution-built capacity data which did not originally incorporate pre-2019 capacity.
- Minor corrections to calculations.

2.2. In addition, we have received feedback on the data used in our original Impact Assessment. The feedback can be summarised into the following broad issues:

- Concerns over the accuracy of our estimate of built capacity, particularly for transmission connected solar PV.
- Concerns over the accuracy of planning status of projects in the queue, particularly for solar and onshore wind
- Concerns over how we have assessed hybrid projects.

2.3. Throughout this section we set out our updated assessment of the impacts of TMO4+. We describe potential sources of differences in the data, updates made since the Minded-to consultation, and the impacts these inaccuracies, uncertainties, and updates have on our assessment of projects receiving a Gate 2 and Gate 1 offer, and how this informs our final decision.

2.4. We have also carried out a comparison to publicly available data published by Regen as a sensitivity case, to understand the impacts of TMO4+ on the battery, solar, and onshore wind projects. This is described in detail in Appendix 5: Data Sensitivity Check.

Update: CP2030 Action Plan solar capacities

2.5. Following the publication of the Impact Assessment which accompanied our minded-to consultation, and in response to feedback received from industry during that period, DESNZ republished the CP2030 Action Plan Annex on 7 April[23] with amalgamated transmission and distribution solar zones for 2031-35, reflecting the misalignment for 2031-35 between solar permitted capacities within the CP2030 Action Plan and the actual solar delivery pipeline across transmission and distribution for this time period. This means that for the 2031-35 period, solar projects connecting at distribution or transmission will contribute to the combined solar PV permitted capacities within a given transmission region, rather than separate permitted capacities at distribution and transmission.

2.6. In our Minded-to consultation, we had noted that the Connections Methodologies allow NESO to address the potential imbalance of an oversupply in one area/voltage level and an undersupply in another in a way that reflects the overall objective of achieving Clean Power by 2030, respects national permitted capacities in the CP2030 Action Plan, accounts for the relative readiness projects, and considers trade-offs such as electricity system constraints.

2.7. NESO was actively considering how to address the identified solar imbalance across transmission and distribution, either through substitution (as already provided for in the draft Connections Methodologies at the time), or whether a revisiting of the transmission and distribution split of solar permitted capacities was warranted.

2.8. Some respondents to our minded-to consultation noted this point and provided their view. Most set out a case for either increasing solar permitted capacities in general or allowing for 'permeability' across transmission and distribution. One stakeholder made the point that the CP2030 Action Plan

[23] Clean Power 2030 Action Plan: connections reform annex (updated April 2025)

solar permitted capacities should not change as a signal on the split had already been sent to the market through this publication.

2.9. NESO and DESNZ were also subject to similar feedback and came to the view that the split between transmission and distribution after 2030 required updating. Accordingly, DESNZ republished the Connections Action Plan Annex reflecting amalgamated transmission and distribution zones for 2031-35. A discussion of other proposed changes to the permitted capacities proposed by consultation responses is at Appendix 1: Consultation Analysis – Impact Assessment.

2.10. We can see that the principal reason for the change is that the market is projected to shift more towards larger solar projects at transmission more than the Future Energy Scenarios (FES) that underpin the 2035 permitted capacities anticipated. As a result, if the splits were maintained, there would be a risk of an imbalance between solar at transmission and distribution between 2031-35 (if not addressed as noted above), which would not be reflective of the actual solar pipeline and system need. We note the Government's approach to amalgamate the transmission and distribution splits for solar in light of the new information.

2.11. As well as better representing the change in the market, we also see a secondary benefit of amalgamating transmission and distribution splits in that it ensures that the 'most ready' projects are more likely to receive Gate 2 terms.

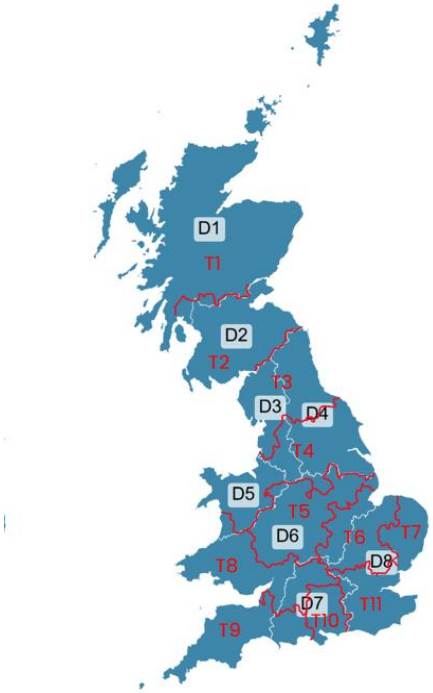
2.12. Using 'substitutions' (the mechanism allowed for in the CNDM) without amalgamating 2031-35 transmission and distribution zones for solar would mean that in a zone with an 'undersupply' of technology against the CP2030 Action Plan pathway, relatively less well-advanced projects (eg those with only land rights) would be included within the permitted capacities for that zone irrespective of the permitted capacity of overlying or adjacent zones. Only after all ready projects in that zone are included would other projects (eg projects with 'planning submitted') in an adjacent or overlaying oversupplied zone be considered, depending on constraints, as eligible to meet Strategic Alignment Criterion B on account of remaining 'undersupply' in an adjacent or overlaying zone.

2.13. It is not possible to be certain about the specific outcomes of substitution ahead of readiness declarations and without a full assessment of the impact

on constraints. However, in general, merging transmission and distribution zones for 2031-35 means that the most well-advanced and unprotected projects within merged zones are more likely to be eligible for a Gate 2 offer. While not all the oversupply of solar projects is expected to receive Gate 2 terms due to this amalgamation, the impact of amalgamating transmission and distribution zones is that there is far less likely to be an oversupply of projects with planning submitted following substitution.

2.14. Figure 11 below shows the CP2030 Action Plan transmission zones, overlaid onto the distribution zones.

Figure 11 CP2030 Transmission Zones overlaid on Distribution Zones



2.15. Table 11 below shows the new combined permitted capacities for solar in the updated CP2030 Action Plan: Connections Annex.

Table 11: Combined transmission and distribution permitted capacities from updated Clean Power Action Plan: Connections Annex.

Transmission Zone	CP Action Plan permitted capacities (MW)
T1	2,500
T2	2,600
T3	5,200
T4	9,500
T5	13,700
T6	9,500
T7	3,300
T8	8,300
T9	5,500
T10	2,300
T11	7,000
Total	69,400

2.16. We have taken these new amalgamated zones as the base case for solar in this Impact Assessment.

Summary: Impacts of Connection Reform TMO4+ on the current connections queue

2.17. The objective of reform is to ensure that the connections process can 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. These provide the foundation for an efficient system, but beyond this must result in a connections process that brings forward and connects the projects that will deliver the queue with the correct mix of generation and storage at the rapid pace required to achieve Clean Power by 2030 and net zero, and support the connection of demand which itself supports economic growth.

2.18. To achieve this requires the queue to be **viable** (contain projects that are ready and progressing towards completion); **needed** (aligned with strategic

energy system need) and **operate efficiently**; and to maintain this on an enduring basis.

2.19. This section assesses the likely impacts that applying TMO4+ readiness and strategic alignment criteria is projected to have on the current queue, and how far that will go to delivering a queue that will deliver those benefits.

2.20. As stated in the Gate 2 Criteria Methodology[24], in order to receive a Gate 2 Connection offer, a project seeking connection must:

- Have land rights and/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 permitted 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
    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 Criteria Methodology Document, i.e. Transmission-Connected Demand, Wave, Tidal, Non-GB Generation

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

- contracted to connect by the end of 2026.[25]
- 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.

[24] Gate 2 Criteria Methodology

[25] We have requested NESO to make changes to relevant protections for those projects contracted to connect by end-2027 with planning consent, that they receive the equivalent protections (ie confirmed date and location) as those contracted to connect by end-2026.

- (For Interconnector, LDES 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.

2.22. Our assessment finds that a ready-only queue continues to contain a large amount of excess capacity, and so will not deliver efficient network build and connection, nor bring forward and connect all needed technologies at the pace necessary to achieve Clean Power by 2030.

2.23. After applying the readiness criteria and strategic alignment criteria above, in our middle scenario the queue is expected to be roughly 296GW of projects (including built capacity[26]), with more than 482GW of capacity receiving Gate 1 terms. Within the Gate 1 queue around 360GW of the queue are expected to be made up of battery and solar technology projects, due to their overcapacity compared to the CP2030 Action Plan permitted capacities.

2.24. Our assessment indicates a Gate 2 queue which is well aligned to the needs of the CP2030 Action Plan (materially more so for solar by the solar adjustments). We find a credible risk of small amounts of under-supply in some technologies, reflecting the underlying risk in the current queue, which underscores the importance of a connections process which can ensure sufficient needed technologies receive the connection dates required to meet national decarbonisation goals. This updated Impact Assessment finds a slightly smaller Gate 1 queue compared to our minded-to, with the most significant changes being driven by the combining of solar capacities.

2.25. Our updated analysis suggests that it is possible that the amount of capacity in the existing queue that is eligible for relevant 'protections' will surpass the permitted capacities in the CP2030 Action Plan. If this happens, all

[26] Built capacity refers to the total amount of electricity generation capacity that has already been constructed and energised.

capacities that qualify for relevant 'protections' retain Gate 2 terms and all other ready projects in that region would receive Gate 1 terms. This appears possible for batteries, with a small volume under our central scenario but a more material volume (and a small amount of solar) under higher scenario or sensitivity.

2.26. Overall, our assessment shows future Gate 1 and Gate 2 queues that would enable more efficient build and connection of a pipeline of generation and storage technologies in line with the CP2030 Action Plan, balancing enabling focused investment with appropriate protections.

2.27. We have carefully considered whether the differing assessments highlighted by the Regen data, or other credible sensitivities, would change our assessment of the impact of readiness reform to a degree that would change our decisions, and conclude that our assessment of benefits and disbenefits remains sound within these slightly different outcomes of queue reform, with the benefits remaining very material.

2.28. In the following section we discuss the impact of applying the readiness criteria alone to generation and storage, followed by applying strategic alignment criteria, to demonstrate the impacts in respect of each stage. We focus primarily on the period out to 2035, but the challenges we examine will remain equally relevant beyond that to 2050. Built capacity is included when we quote the resulting size of the queue so that an easy comparison that can be made to the CP2030 Action Plan permitted capacities, which will be met by the current built capacity, plus projects in the queue that are connected in future.

2.29. Demand is automatically deemed as needed, in that it is deemed to meet the strategic alignment criteria. We think from data from NESO and the network companies that there is approximately 17GW of demand projects at Transmission and 25 GW at distribution, totalling 42GW across the combined queue. From the RfI, responses from transmission-connecting demand projects indicate that approximately 8GW of projects will receive a Gate 2 offer and 11GW of projects will receive a Gate 1 offer due to readiness, totalling 19GW. Whilst the total capacity numbers don't exactly tally, likely due to underlying data assumptions, the RfI does at least highlight that around 40% of demand projects at transmission are likely to receive a Gate 2 offer. Any demand project will be able to move from the

Gate 1 queue to Gate 2 queue by meeting the readiness criteria as per Section 3.1 of the Gate 2 Criteria Methodology. The impact on demand is primarily discussed later on in one section for simplicity (Impact on demand projects).

Assessment of applying readiness criteria alone to the existing queue – generation and storage

Context

2.30. In May 2024, NESO issued an RFI to developers to better understand the readiness status of projects in the queue to inform their TMO4+ proposals.[27] The results showed that, while the TMO4+ proposals as they then stood would likely reduce the size of the queue significantly, the anticipated reduction would not be sufficient, with a queue size far in excess of projected system need, and that would be unlikely to deliver a technology mix that aligns with what GB is forecast to need to deliver a secure energy system in 2030 or even 2050 based on NESO's Future Energy Scenarios (**FES**).[28] In our open letter of September 2024, we stated that it was critical that the opportunity was taken now to ensure the alignment between connections and the strategic planning of the GB energy system, and that NESO should incorporate this alignment into the TMO4+ proposals[29]

2.31. The following section outlines our assessment of applying readiness criteria alone to the existing queue and why we conclude that, whilst the readiness criteria settled on by NESO and industry through working groups strikes the best balance between demonstrating suitable progression and not being overly burdensome on users, readiness criteria alone would not deliver the energy mix needed to reach net zero and interim carbon budgets as set out in the CP2030 Action Plan or FES, and certain technology types may be more easily able to meet the readiness criteria.

Assessment

2.32. We have assessed the transmission queue utilising a dataset provided by NESO containing data on planning status (further detail provided in Data used below).

2.33. Table 12 below shows an estimate of transmission queue capacity for generation and storage projects, by readiness level and excluding already built projects.

[27] Connections Reform | National Energy System Operator - see "land rights request for information analysis"

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

[29] Open letter on the reformed regulatory framework on connections

Table 12: 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)

Built	Under Construction	Planning Consents approved	Awaiting Consents	Land Rights	Total Gate 2	Total Gate 1[30]	**Total**
85.3	12.5	50.0	76.7	119.1	343.6	246.0	589.6

2.34. For the distribution queue, we have relied on data provided by the DNOs to assess the potential size of the Gate 2 distribution queue if TMO4+ readiness criteria alone were applied. The data is the DNOs' best available information on the readiness of projects within the queue and it is based on known status of users that 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. Given when it was collected it may underestimate the current readiness level of distribution projects, particularly the capacity of projects with land rights.

2.35. Table 13 below shows the combined distribution queue capacity for generation and storage projects, by readiness level.

Table 13: Potential distribution queue (GW) after application of TMO4+ readiness criteria based on DNO knowledge of project readiness level (Source: DNOs)

Built	**Under Construction**	**Planning Consents approved**	**Awaiting Consents**	**Land Rights**	**Total Gate 2**	**Land Status unknown**	**Total**
37.4	4.2	18.0	12.7	1.9	74.2	114.4	188.6

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

2.36. By combining the two sets of data (transmission and distribution), we assess that the potential size of the queue if applying TMO4+ readiness criteria alone could be 295GW (excluding built capacity), 418GW including built capacity. This is likely to be higher, due to uncertainty in the number of projects which have land rights (and therefore meet the readiness criteria). Assuming 50%[31] of those whose land rights status is not known had or obtained land rights prior to implementation, this would increase the size of the queue by 180GW, resulting in a queue of 475GW (excluding built capacity) and 598GW (including built capacity).

2.37. Applying readiness criteria alone would result in significant capacity remaining in the Gate 2 queue, resulting in a queue size substantially greater than is needed to achieve Clean Power by 2030 and remain on track for net zero.

2.38. Figure 12 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)[32]. With the exception of the 'Land Rights Unknown' cohort, all other categories of projects shown in the Figure 12 would proceed to Gate 2 under a readiness only scenario, showing that CP2030 Action Plan permitted capacities would be exceeded for most technology types.

[31] 50% was chosen as this is approximately the percentage of respondents to the RFI who said they had land rights.

[32] When assigning capacity to technology types for hybrid projects, in alignment with assumptions made by 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.

Figure 12: Capacity (in GWs) of the queue split by readiness and planning status compared to the maximum capacity for 2035 in CP2030 Action Plan

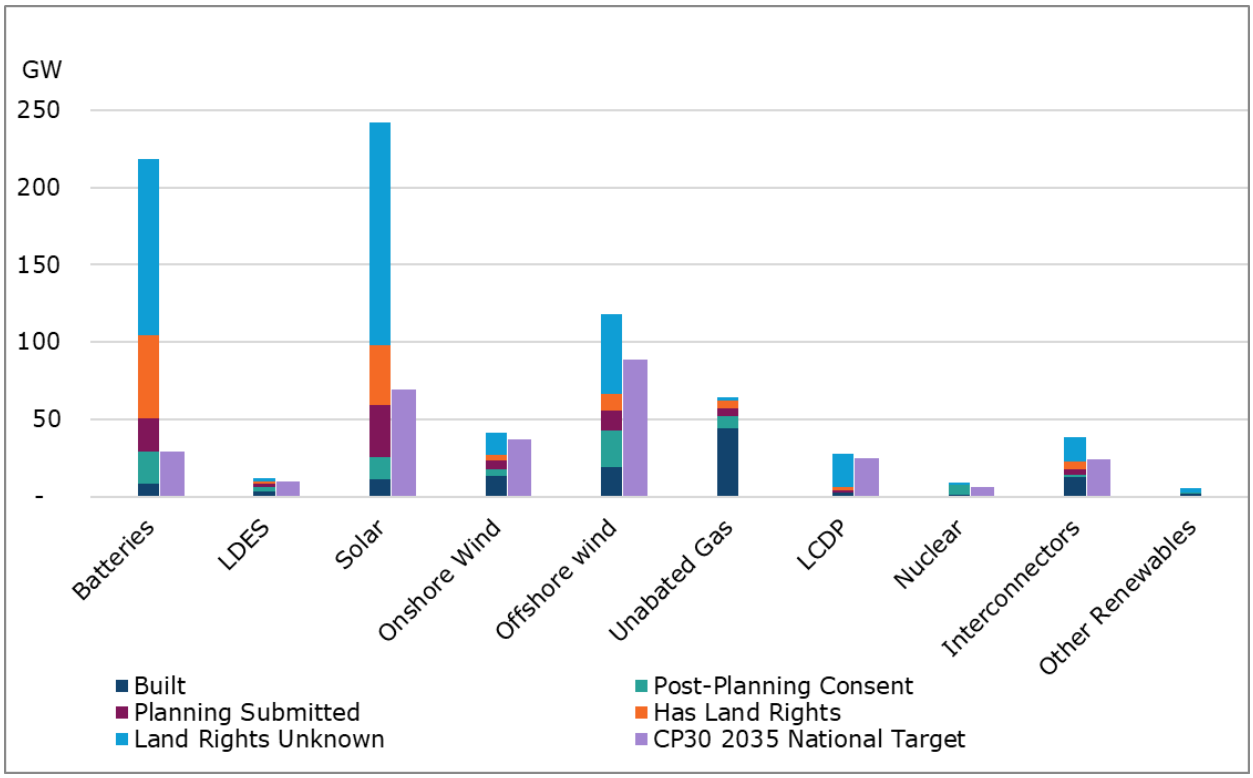


Table 14: Capacity (in GWs) of the queue split by readiness and planning status compared to the maximum capacity for 2035 in CP2030 Action Plan

Technology	Built	Post-Planning Consent	Planning Submitted	Has Land Rights	Land Rights Unknown	CP30 2035 National Permitted Capacity
Batteries	8.4	22.3	22.9	55.6	110.7	28.7
LDES	3.4	2.6	2.7	1.5	1.6	10.0
Solar	11.2	14.2	34.8	38.8	140.2	69.4
Onshore Wind	14.7	5.1	5.9	3.9	14.4	37.0
Offshore wind	19.6	23.5	13.1	10.5	50.1	89.0
Unabated Gas	44.0	8.5	5.0	4.8	2.4	0.0
LCDP	3.1	0.0	0.9	2.3	21.6	25.0
Nuclear	1.2	6.7	0.0	0.0	0.9	6.0
Interconnectors	12.7	1.4	4.0	3.6	16.7	24.0
Other Renewables	4.5	0.5	0.0	0.0	1.8	0.0
Total	122.7	84.7	89.3	121.0	360.5	289.1

2.39. If, albeit unlikely, the full queue met the 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 a material oversupply of solar and batteries, and an undersupply of onshore wind, offshore wind, and low-carbon dispatchable generation.

2.40. 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.

2.41. The potential 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 Clean Power by 2030. For technologies such as onshore wind and offshore wind, the data shows that meeting the permitted capacities 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. Newer low-carbon technologies (low-carbon dispatchable power) are projected to be significantly under-supplied, and in this scenario any new projects to fill this need would join the back of a queue which, as reformed on the basis of readiness alone, will remain very substantial. Relatively less connection capacity would be released and there is no mechanism to progress projects based on needed technology. Over-supplied projects may drop out relatively late (compared to the pace of network build and investment horizon of other projects), so the significant oversupply, particularly of batteries, would risk crowding out projects of technologies such as wind, which will be needed to deliver CP2030 Action Plan.

2.42. In summary, our updated assessment shows a ready-only queue does not provide sufficient foundation to deliver efficient network build and connect at pace, and so bring forward and connect all technologies - at the required pace - necessary to achieve Clean Power by 2030 and remain on track beyond. Applying readiness criteria alone would result in a queue that is still over-supplied in certain technologies, creating a material block to key technologies connecting at the speed necessary to avoid under-supply. It would provide somewhat improved but still limited certainty for network reinforcement needs, which would drive a combination of some higher and inefficient network build costs as well as some delay to network build and pace of connection (discussed later in this Chapter). A 'ready only' queue still implies a *highly* challenging rate of build and connections to achieve Clean Power by 2030. The knock-on effect for customer connection agreements and resultant uncertainty for customers as to whether their connection dates will realistically be delivered means investor confidence will not be sufficiently materially improved.

2.43. Therefore, applying readiness criteria alone will not achieve the relevant objectives; a further filter of the queue is necessary to ensure it is made up of projects that are required to meet the CP2030 Action Plan.

Background: Data used to apply readiness criteria to the existing queue

Use of Built Capacity data to apply readiness criteria

2.44. Our assessment of the impacts of TMO4+ on the existing queue (above), and assessment of the capacity of different technologies which would receive Gate 2 and Gate 1 offers, is based on two sets of data:

- Data provided by NESO, containing a list of directly connected transmission projects.
- Data provided by the DNOs, aggregating the capacity of their distribution queue by generation technology type and readiness / planning stage.

2.45. As stated in our original Impact Assessment, we applied an assumption to the NESO dataset, updating the readiness status of projects with a connection date before 2025 to 'Built'. This was done to mitigate any potential out of date connection status.[33] We recognised that this could lead to an overestimation in built capacity at transmission. However, we considered it to be a reasonable assumption as projects with a connection date before 2025 will likely be well-advanced and, if not built, will likely have planning consent and therefore be protected -- contributing towards the CP2030 Action Plan permitted capacities in any event.

2.46. Consultation respondents agreed that our data overestimates the amount of built capacity, in particular for transmission connected solar.

2.47. 314 projects were classified as 'Built' using this rule. Of these, 119 generation / storage projects had a different readiness status in the NESO dataset:

- 30 (6.7GW) projects were classified as 'Under Construction'.
- 62 (6.8GW) projects were classified as 'Planning Consents Approved'.

[33] This assumption was made in light of potential heterogeneity in the sourcing of 'Built' status in the original dataset.

- 23 (3.3GW) projects were classified as ‘Scoping’.
- 5 (0.3GW) projects were classified as 'Planning submitted’.

2.48. This assumption therefore means our data likely overestimates the amount of capacity currently built and connected to the system by up to 17.1GW of transmission connected capacity. The result of this is that the capacity gap between ‘Built’ capacity and the CP2030 permitted capacities in our original Impact Assessment was shown to be smaller than they are expected to be in reality. Therefore, in reality more capacity is available in the Gate 2 queue (as the original Impact Assessment showed less than reality).

2.49. However, the majority of the capacity (13.8GW of 17.1GW) potentially misclassified as ‘Built’ is either already under construction or has achieved planning consent and would therefore be protected and receive a Gate 2 offer in any event.

2.50. Therefore, the difference between the capacity which will be available in Gate 2 and that shown in our Impact Assessment as a result of this assumption is likely to be minimal (c.4GW). As such, the impact of this assumption on assessing the capacity of projects of different technology types receiving a Gate 2 or Gate 1 offer is also minimal.

2.51. In addition to the general assumption described above, it was also identified that there was an error resulting in an additional 2GW of solar capacity being classified as ‘Built’. This was due to a misclassification of the Ratcliffe-on-Soar decommissioned coal project as a 2GW ‘Built’ solar site. This has since been corrected in the underlying NESO dataset, and our analysis now reflects this. The impact of this correction is less ‘Built’ capacity in the T5 transmission zone, enabling more solar capacity in the Gate 2 queue, and reducing the capacity of solar moved to Gate 1 in this region.

2.52. Figure 13 below shows the solar queue in T5 before and after correcting for the misclassification of Ratcliffe-on-Soar as a 2GW built solar project. The impact of the change is that 2GW more solar projects would receive a Gate 2 offer than estimated in our original Impact Assessment.

Figure 13: Table of solar queue in T5 before and after correcting for the misclassification of Ratcliffe-On-Soar as a 2GW built solar project in GW

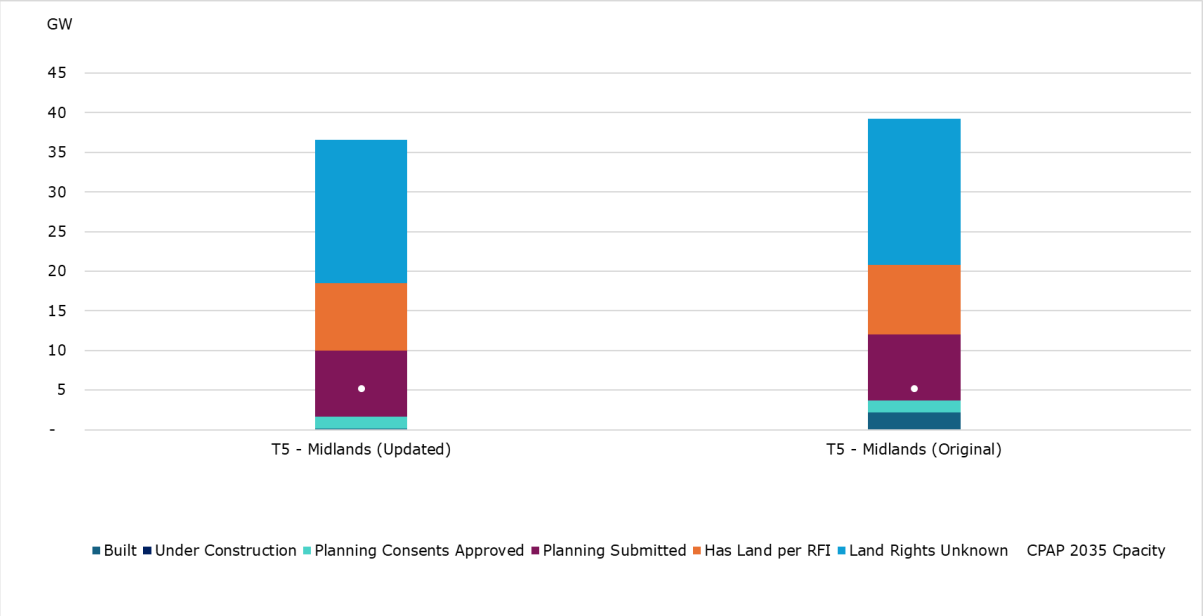


Table 15: Table of solar queue in T5 before and after correcting for the misclassification of Ratcliffe-On-Soar as a 2GW built solar project in GW

	Built	**Under Construction**	**Planning Consents Approved**	**Planning Submitted**	**Has Land per RFI**	**Land Rights Unknown**	**Grand Total**	**CP2030 Action Plan 2035 Capacity**
T5 - Midlands (Updated)	164	-	1,530	8,311	8,482	18,120	36,607	5,200
T5 - Midlands (Original)	2,185		1,530	8,311	8,732	18,520	39,278	5,200

2.53. The original Impact Assessment applied an assumption on built data, which we recognise may have overestimated these capacities. However, as these capacities will likely be protected, it does not alter the overall findings of the Impact Assessment. Therefore, we are comfortable with the difference, and do not intend to make any changes (beyond those described above).

Use of Planning Status data to apply readiness criteria

2.54. Whether a project has obtained land rights, and its planning status, is not currently known for all projects. To assess the impacts of TMO4+ and the application of the readiness criteria on the queue, NESO made 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 that did not respond.

2.55. Respondents were asked to confirm 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.

2.56. NESO received a total of 2869 responses, corresponding to 559 GW of capacity in the combined transmission and distribution queue. This represented ~90% of the capacity of the connections queue[34].

2.57. NESO supplemented the RFI data, with support from Regen, with a further assessment of the readiness level of the transmission queue using planning data contained within the Renewable Energy Planning database, Searchland, and the English Nationally Significant Infrastructure Project (NSIP) register[35].

2.58. A readiness status was assigned to each project in the existing queue based on the Regen data where it was available, then RFI responses and then the status in the TEC register, in that order of priority.

2.59. In relation to planning status, we use a dataset provided by NESO containing data on planning status, with some limited updates (noted below).

2.60. 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

[34] ~90% of the capacity of the queue at the time the data was collected.

[35] December - Connections Reform Data Assessment

have land rights?" has land rights, and that any respondents replying "No" or non-respondents (not identified as having met a later milestone such as having planning consents) do not have land rights.

2.61. The readiness data used in this updated Impact Assessment reflects the status of projects from June to October 2024, but responses to our consultation have indicated that projects have progressed since this time. For example, we have seen evidence of onshore wind projects in Scotland that have a readiness status of 'Planning Submitted', which have now received planning consent.

2.62. Similarly, the data received from the DNOs is based on their best available knowledge of the existing queue and informed by projects that have provided evidence of meeting Queue Management Milestones, and was supplied in February 2025 (with subsequent updates provided by the DNOs after our consultation was published).

2.63. Therefore, it is likely that, even with the updates discussed in subsequent sections, that our assessment assumes an underestimation of the capacity of projects with land rights, by virtue of the passage of time since the data was collected. It also likely underestimates the capacity of protected projects that will receive a Gate 2 offer, due to more projects obtaining planning consent than the original data set; and the level of readiness of projects that will ultimately be moved to Gate 1.

2.64. The impact of readiness data on solar, battery and onshore wind, particularly data on who has achieved planning consent reflecting the status of projects in 2024, has been sensitivity checked with Regen's published data analysis[36] that we explore in more detail in Appendix 5: Data Sensitivity Check.

Assessment of applying readiness criteria to the existing queue – demand

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

[36] Regen Dashboard – Timestamp of data used is 29 January 2025

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

2.67. All demand projects are out of scope of the CP2030 Action Plan and therefore would automatically be deemed to have met the strategic alignment criteria. Demand is automatically deemed as needed, in that it is deemed to meet the strategic alignment criteria. We think from data from NESO and the network companies that there is approximately 17GW of demand projects at Transmission and 25 GW at distribution, totalling 42GW across the combined queue. From the RfI, responses from transmission-connecting demand projects indicate that approximately 8GW of projects will receive a Gate 2 offer and 11GW of projects will receive a Gate 1 offer due to readiness, totalling 19GW. Whilst the total capacity numbers don't exactly tally, likely due to underlying data assumptions, the RfI does at least highlight that around 40% of demand projects at transmission are likely to receive a Gate 2 offer. Any demand project will be able to move from Gate 1 to Gate 2 by meeting the readiness criteria as per Section 3.1 of the Gate 2 Criteria Methodology. The impact on demand is primarily discussed later on in one section for simplicity (Impact on demand projects).

2.68. This means that demand projects are less restricted and, provided that they can demonstrate that they are ready to connect, would be able to join the Gate 2 queue. As demonstrated throughout the Impact Assessment document, the Gate 2 queue would be a smaller queue than the status quo, and therefore would result in capacity being released on the network, which could be utilised by demand and lead to quicker connection dates. This is also true for network capacity at distribution.

2.69. 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.

2.70. In response to both our consultation, and the NESO's policy consultation, on the Connection Methodologies, a small number of respondents stated that although impacts on the supply side (generation) that impacts on demand users, in particular data centres, had not been understood, specifically noting concerns on how the requirement to demonstrate land rights would

impact on data centre development. Some of those respondents asked for different readiness criteria for data centres. As laid out in our decision on Gate 2 Methodology, we do not agree that demand projects should be exempt from needing to demonstrate progression. Ensuring projects are demonstrating readiness is a core policy intent of these reforms, and if demand sites are unable to demonstrate this, it is justifiable for these projects to be moved to Gate 1 until readiness can be demonstrated. Workable alternatives for demand projects to demonstrate progress that are consistent with the policy intent to establish readiness to be in the Gate 2 queue were not put forward during consultation.

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

2.72. Overall, we consider that TMO4+ puts the energy system in a better baseline position and provides opportunities for all ready and needed projects to progress (including demand, as all projects are deemed needed). Projects that do not meet the ready and needed criteria will be moved to the Gate 1 queue, making it likely that some demand projects that are ready receive improved dates. We are also exploring with the Government and NESO whether any further future changes to the connections process is required to better facilitate demand.

2.73. We have assessed that TMO4+ will have positive impacts on demand projects seeking to connect compared to the status quo.

Assessment of applying strategic alignment criteria to the queue

2.74. The objective of reform is to ensure that the queue can 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, in order to deliver a more efficient system and bring forward and connect the projects that will deliver the correct mix of generation and storage at the rapid pace required to achieve Clean Power by 2030 and net zero by 2050.

2.75. This section tests whether applying both readiness and then strategic alignment criteria effectively delivers these objectives.

2.76. Under TMO4+, projects will 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. 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 the permitted capacities specified in the CP2030 Action Plan, unless one of the protections specified in the Gate 2 Criteria Methodology (section 6.2) or strategic criterion (c) or (d) apply.[37] The CP2030 Action Plan sets out national permitted capacities for some technologies, regional transmission permitted capacities for some technologies, and distribution permitted capacities.[38]

2.77. Battery projects have a specific capacity for each transmission and each distribution zone. There are 11 transmission zones and 8 distribution zones. Onshore wind has permitted capacities set for each transmission and each distribution zone to 2030, at the level of Scotland and England & Wales to 2035.

2.78. As previously noted, for 2031–35, the permitted capacities for distribution solar have been amalgamated with permitted capacities for each transmission solar region. We describe the impacts of this change in more

[37] Gate 2 Criteria Methodology

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

detail in 'Appendix4: Amalgamation of Solar Transmission and Distribution Zones', but have updated our regional analysis in the tables below.

2.79. All other technologies included in the CP2030 Action Plan have GB-wide permitted capacities.

2.80. Table 16 below shows the maximum CP2030 Action Plan technology and regional permitted capacities for 2030 and 2035. We have shown, in Table 18, the CP2030 Action Plan permitted capacities for technologies at the regional level for solar (amalgamated with transmission zones for 2031–35) and batteries. The other permitted capacities are listed for each technology at the regional level for which they will be applied.

Table 16: CP2030 Action Plan national 2030 technology permitted capacities (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**
Solar	**47**	**69**
Interconnectors	**14**	**24**

Table 17: CP2030 Action Plan - Onshore wind permitted 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 18: CP2030 Action Plan transmission zone permitted capacities for solar (amalgamated with distribution for 2031 – 35) and batteries

Region	2030 Solar Capacity (MW)	2035 Solar Capacity (MW)	2030 Battery Capacity (MW)	2035 Battery Capacity (MW)
T1 – N. Scotland	**100**	**2,500**	**1,900**	**1,900**
T2 – S. Scotland	**600**	**2,600**	**3,900**	**3,900**
T3 - N. England	**500**	**5,200**	**800**	**800**
T4 – N. Wales the Mersey and the Humber	**1,200**	**9,500**	**4,200**	**4,200**
T5 – Midlands	**4,000**	**13,700**	**1,300**	**1,300**
T6 – Central England	**2,100**	**9,500**	**500**	**500**
T7 – E. Anglia	**100**	**3,300**	**200**	**200**
T8 – S. Wales and the Severn	**1,100**	**8,300**	**900**	**900**
T9 – S.W. England	**300**	**5,500**	**400**	**400**
T10 – South England	**200**	**2,300**	**100**	**100**
T11 – South-East England	**600**	**7,000**	**1,700**	**1,700**
Total	**10,800**	**69,400**	**15,900**	**15,900**

Table 19: CP2030 Action Plan 2030 distribution permitted capacities for Solar (up to 2030 only due to amalgamation with transmission zones for 2031 - 35), and Batteries

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

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

- Assess the protected capacity for each technology type, for each transmission and distribution zone (note that CP2030 Action Plan permitted 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 permitted capacity, calculate the capacity of projects that meet the readiness criteria and add them to the queue unless the 2035 CP2030 Action Plan permitted 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 will 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.

Changed solar permitted capacity

2.82. To assess the impacts of the updated CP2030 Action Plan: Connections Annex, we needed to know the volume of solar in the distribution queue, aggregated by transmission zone. This information was collected from each of the DNOs and we have combined this data with the solar volume at transmission, which resulted in a combined queue for each transmission region, (Table 20 below).

Table 20: Combined capacity of solar projects in the distribution and transmission queue (over TIA threshold) by CP2030 Action Plan Transmission Zone

Transmission Zone	**Built**	**Under Construction**	**Planning Consents Approved**	**Planning Submitted**	**Has Land per RFI**	**CP30 2035 Permitted Capacity**
T1 - N. Scotland	128	4	445	1,123	801	2,500
T2 - S. Scotland	155	264	259	460	1,462	2,600
T3 - N. England	319	48	857	2,118	45	3,387
T4 - N. Wales, the Mersey and the Humber	1,280	1,227	292	5,592	1,109	9,500
T5 - Midlands	1,676	495	3,763	7,766	-	13,700
T6 - Central England	1,712	117	1,398	4,754	1,519	9,500
T7 - E. Anglia	660	122	380	2,139	-	3,300
T8 - S. Wales and the Severn	1,887	207	1,224	2,779	1,652	7,748
T9 - S.W. England	1,176	189	1,149	1,291	1,695	5,500
T10 - S. England	964	30	391	915	-	2,300
T11 - South-East England	1,202	82	1,256	1,637	1,192	5,368
Total	**11,157**	**2,785**	**11,414**	**30,572**	**9,475**	**65,403**

2.83. A detailed assessment of the analysis and impacts of the amalgamation of solar transmission and distribution zones, following the updated CP2030 Action Plan: Connections Annex, can be found in 'Appendix 4: Amalgamation of Solar Transmission and Distribution Zones'.

2.84. The key points on how we have approached this assessment are:

2.85. We have assumed that any project with a registered connection date earlier than 1 Jan 2025 has been built and is connected, with data limitations

discussed earlier in this chapter. This leads to a total figure of 123GW of built capacity.

2.86. When assessing what the queue will be when TMO4+ is implemented, we have used the regional 2035 capacities for solar (amalgamated to transmission zones) and batteries, the national 2035 permitted capacities for onshore wind, and the GB permitted capacities for other generation and storage technologies, in alignment with the Connections Methodologies.

2.87. 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 under TMO4+.

2.88. To account for uncertainties in readiness, and the way in which NESO will re-balance CP2030 Action Plan permitted capacities,[39] we assessed three scenarios which are defined as follows:

- Low estimate – Gate 2 queue made up of built and protected capacity only.
- 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 permitted capacities.
- High – made up of built and protected capacity, and assuming all regional and national CP2030 Action Plan 2035 permitted capacities 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).

2.89. We have also carried out a comparison to publicly available data published by Regen as a sensitivity case, to understand the impacts of TMO4+ on the battery, solar, and onshore wind projects.

[39] 5.14.1 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. This rebalancing will only be permitted where the criteria outlined for substitutions in Section 5.16.2 are met."

Table 21: Estimated capacity of projects that could reach Gate 2 under our three scenarios compared with the national CP2030 Action Plan 2035 permitted capacities for each technology

Technology	**Low (GW)**	**Medium (GW)**	**High (GW)**	**2035 National permitted capacities (GW)**
Batteries	30.7	33.3	35.1	28.7
LDES	6.0	10.0	10.0	10.0
Solar	25.4	65.4	69.4	69.4
Onshore Wind	19.7	27.3	32.2	37.0
Offshore Wind	43.1	66.7	89.0	89.0
Unabated Gas	52.4	52.4	52.4	0[40]
Low carbon dispatchable power	3.1	6.3	25.0	25.0
Nuclear	7.9	7.9	7.9	6.0
Interconnectors	14.1	21.7	24.0	24.0
Other Renewables	4.9	5.0	6.8	0.0
Total Capacity	207.3	296.0	351.9	289.1

2.90. 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 permitted capacities across regional or transmission and distribution boundaries in

[40] The 2030 capacity for unabated gas projects is 35GW.

response to oversupply. This is not, however in our assessment, 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.[41]

2.91. We expect the queue resulting from implementation of TMO4+ reform package to be closer to our medium case (296GW including built capacity, 173GW excluding built capacity) and closer to the national CP2030 Action Plan, noting that there is undersupply in some technologies and over-supply of others, which is explored below.

2.92. Unlike the queue resulting from the application of the readiness criteria alone (418GW including built capacity, 296GW excluding built capacity) the middle case here is almost half the size of a queue based on readiness alone and much more closely aligned with system need. Even in the high case, the queue resulting from strategic alignment would be 15% smaller than a queue based on readiness and much more closely aligned to the technology mix needed as per the CP2030 Action Plan.

2.93. Across the eleven transmission regions, our assessment finds that all regions show a likely oversupply of battery projects when you compare those that are 'ready' and protected, with the 2035 CP2030 Action Plan permitted capacities, when strictly applying the transmission and distribution permitted 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 permitted capacities, or substitutions, they will receive Gate 1 terms, due to surpassing the 2035 CP2030 Action Plan permitted capacities. We estimate that there will be 76GW of 'ready' batteries provided a Gate 1 offer and 34GW of 'ready' solar projects provided a Gate 1 offer (when applying the transmission and distribution permitted capacities).

2.94. The key impact of combining the transmission and distribution zone permitted capacities (different from our minded-to Impact Assessment) is

[41] Rebalancing refers to recalculations of the permitted capacities for zones to account for protections leading to regional queue sizes in excess of Clean Power permitted capacities. Substitutions allow for distribution and transmission queue permitted capacity to be swapped in neighbouring regions to address situations there is undersupply. See the Connections Network Design Methodology for more details.

that increased solar capacity is expected to receive a Gate 2 offer, up from approximately 39GW in the medium scenario in our original Impact Assessment, which strictly applied transmission and distribution permitted capacities, to 65.4W when applying the new combined permitted capacity. This is material positive, in that it provides a Gate 2 queue much closer to meeting the 69.4GW permitted capacity for 2035 in the CP2030 Action Plan.

2.95. Also, following the amalgamation of solar transmission and distribution zones, we expect that comparably fewer solar projects that have submitted a planning application will be moved to Gate 1, down from 20GW to 4GW. This is a positive impact, in that it reduces any negative consequences for a large pool of advanced solar projects which may have invested in preparing planning applications. However, there is still a risk that without substitutions some projects that have submitted a planning application or are in the pre-application stage of an NSIP process could be moved to Gate 1.

2.96. At transmission some regions are likely to have an oversupply of protected battery projects. North Scotland, South Scotland, South Wales, Southwest England, and South England are expected to have oversupplies of roughly 0.1GW, 2.3GW, 0.5GW, 0.4GW, and 0.5GW respectively, compared to the 2035 CP2030 Action Plan permitted capacities.

2.97. Five distribution regions (D1-SSE, D2-SPED, D3-ENWL, D6-NGED, D8-UKPN) are likely to have an oversupply of protected battery projects[42] alone, compared to the 2035 CP2030 Action Plan permitted capacities.

2.98. NESO's original TMO4+ proposals, consulted on in November 2024, did not include protections. 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 the TMO4+ proposals and introduced protections.

2.99. Although these protections may contribute to a connections queue and pipeline of projects that exceeds the permitted capacities in the CP2030 Action Plan, our view is that protecting these well-advanced projects, which

[42] 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.

have overcome a major hurdle in the development lifecycle (such as obtaining planning permission), is appropriate and proportionate. These projects are likely already factored into network planning, so less likely to result in some of the network planning and efficiency issues described in this document. In that regard, we are satisfied that applying these protections remains in the interests of consumers, including their interest in the Secretary of State achieving carbon budgets in the Climate Change Act 2008 and ultimately net zero.

2.100. Further detail and assessment of these protections can be found in 'Decision: Gate 2 Criteria Methodology', including our assessment of some consultation responses suggesting extending protections to 2027/28 projects.

2.101. Unabated gas has a permitted capacity of 0GW as specified in the CP2030 Action Plan 2035 permitted capacities. Therefore, all unprotected unabated gas projects will be expected to be ineligible for Gate 2 terms by default. However, the criteria have been set with the expectations that security of supply will be regularly assessed, and the Project Designation Methodology[43] will be the route to bring forward new unabated gas plant to ensure security of supply, with such projects prioritised in subsequent windows as required.

Undersupply compared to CP2030 Action Plan permitted capacities

2.102. Applying the strategic alignment criteria significantly reduces the number of projects in the Gate 2 queue, as compared with accepting all projects that meet readiness criteria into Gate 2. This avoids material oversupply but, as with applying readiness only, there is potential undersupply of some technologies. This reflects an underlying risk within the current queue. The regional strategic alignment criteria for solar also contributes to an under-supply, which would not necessarily occur if readiness-only reform were applied.

2.103. In the medium scenario shown above, at a national level, Ofgem anticipates an under-supply of onshore wind (10GW), offshore wind (22GW), low carbon dispatchable technologies (19GW), and interconnectors (2GW)

[43] Project Designation Methodology

compared to CP2030 Action Plan 2035 permitted capacities, and solar (4GW) when applying the amalgamated permitted capacities.

2.104. Figure 15 shows the estimated size of the queue following application of TMO4+ 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 permitted capacities. This corresponds to the medium scenario of queue size shown in Table 21.

Figure 15: 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)

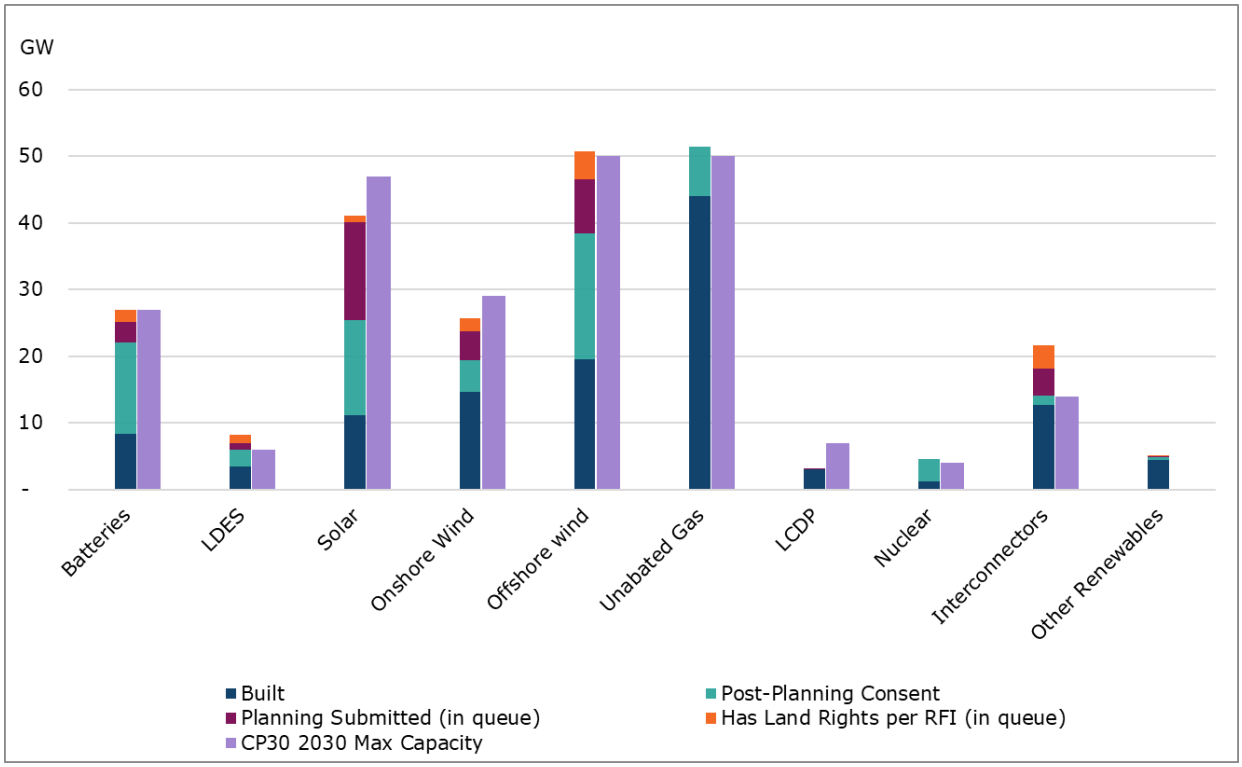


Table 22: Capacity of different technology types with a Gate 2 offer in the queue, split by readiness level, compared to the maximum CP2030 Action Plan 2030 capacity (GW)

Technology	Built	Post-Planning Consent	Planning Submitted	Has Land Rights	CP30 2035 National Permitted Capacity
Batteries	8.4	13.7	3.0	1.9	27.0
LDES	3.4	2.6	0.9	1.3	6.0
Solar	11.2	14.2	14.8	0.9	47.0
Onshore Wind	14.7	4.8	4.2	2.0	29.0
Offshore wind	19.6	18.8	8.0	4.3	50.0
Unabated Gas	44.0	7.4	0.0	0.0	50.0
LCDP	3.1	0.0	0.0	0.0	7.0
Nuclear	1.2	3.3	0.0	0.0	4.0
Interconnectors	12.7	1.4	4.0	3.6	14.0
Other Renewables	4.5	0.5	0.0	0.0	0.0
Total	122.7	66.7	34.9	14.1	234.0

2.105. This shows that for 2030, following the implementation of TMO4+ strategic assessment criteria, there will likely be an undersupply of solar, onshore wind, and low carbon dispatchable (LCDP) compared to 2030 permitted capacities in the CP2030 Action Plan. We estimate the total queue size out to 2030 will reach ~238GW, including 123 GW built capacity.

2.106. Figure 16 shows the estimated size of the queue following application of TMO4+ broken down by progress against milestones for all projects which are assessed to receive a Gate 2 offer, compared to the CP2030 Action Plan 2035 permitted capacities.

Figure 16: 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)

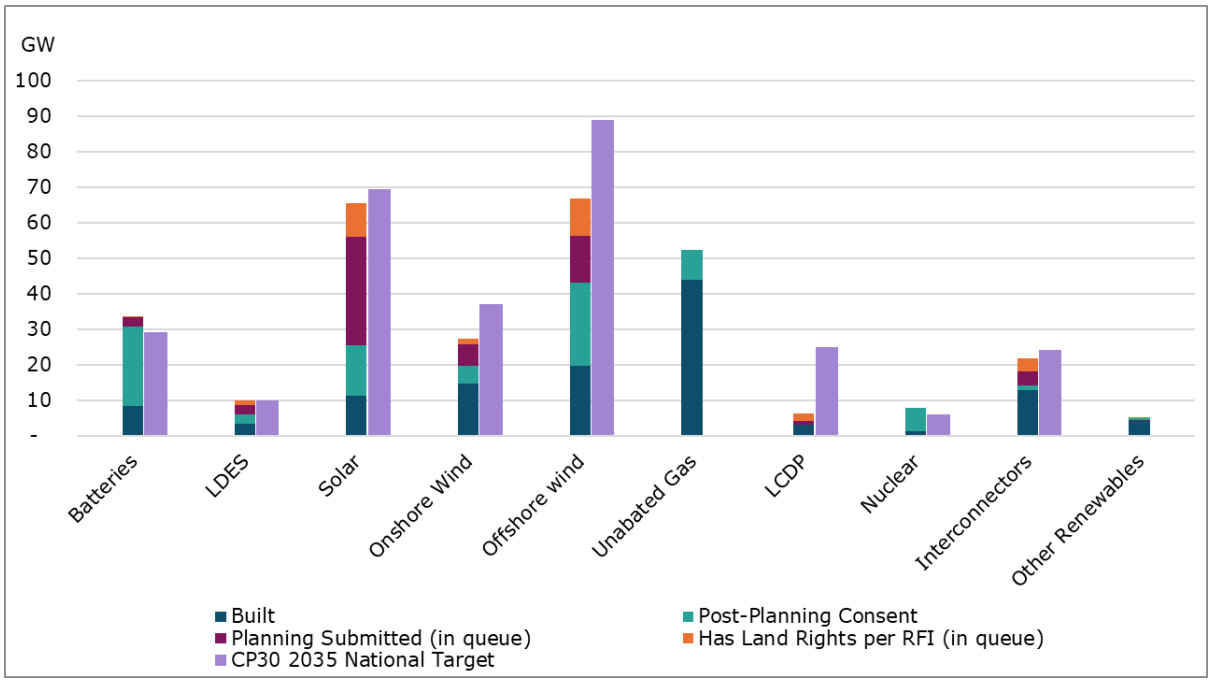


Table 23: Capacity of different technology types with a Gate 2 offer in the queue, split by readiness level, compared to the maximum CP2030 Action Plan 2035 capacity (GW)

Technology	Built	Post-Planning Consent	Planning Submitted	Has Land Rights	CP30 2035 National Permitted Capacity
Batteries	8.4	22.3	2.5	0.1	28.7
LDES	3.4	2.6	2.7	1.3	10.0
Solar	11.2	14.2	30.6	9.5	69.4
Onshore Wind	14.7	5.1	5.9	1.6	37.0
Offshore wind	19.6	23.5	13.1	10.5	89.0
Unabated Gas	44.0	8.5	0.0	0.0	0.0
LCDP	3.1	0.0	0.9	2.3	25.0
Nuclear	1.2	6.7	0.0	0.0	6.0
Interconnectors	12.7	1.4	4.0	3.6	24.0
Other Renewables	4.5	0.5	0.0	0.0	0.0
Total	122.7	84.7	59.7	29.0	289.1

2.107. As noted above, for 2035 we estimate the total queue size to reach 296GW in the medium readiness scenario, including 123 GW built capacity, and we anticipate an under-supply of onshore wind, offshore wind, low carbon dispatchable technologies, solar and interconnectors compared to CP2030 Action Plan 2035 permitted capacities.

2.108. There is a significant undersupply of onshore wind projects in the Gate 2 queue in England and Wales compared to CP2030 Action Plan 2035 permitted capacities. Our analysis indicates a gap between ready onshore wind projects and the CP2030 Action Plan 2035 permitted capacity of approximately 10GW. 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 permitted capacity could be met in

Scotland by ready projects in the current queue (noting the uncertainty when compared with the Regen data).

2.109. The permitted capacities in the CP2030 Action Plan reflect the recent planning rule change,[44] which we expect will enable more onshore wind to be developed in England. Removing projects of oversupplied technologies from the Gate 2 queue will free capacity for undersupplied technologies, such as onshore wind in England, enabling new projects to that come onstream to obtain faster connections than is currently the case under the status quo, as they are implicitly prioritised by the regional permitted capacities.

2.110. Comparing Figure 15 and Figure 16 above to Figure 5 and Figure 6 in the "Problem under consideration" section shows that by applying the strategic alignment criteria contained in TMO4+ on a regional level, some ready projects are moved to Gate 1, meaning that there could be fewer projects with connection dates pre-2030 than are needed for the CP2030 Action Plan despite there being enough ready projects overall (ie at a non-regional level) with connection dates pre-2030. Our scenario highlights that this could be the case for solar. To achieve Clean Power by 2030, one or more of following deviations from the scenario assumption must occur 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 having progressed during the period between the data was collected and implementation of the reforms.
- Gate 2 projects which currently hold a connection date post-2030 receive an accelerated connection date of 2030 or sooner. This is the assumption NESO makes in considering that project attrition does not need to be explicitly included in TMO4+ (see section on attrition later in this Chapter).
- NESO carry out regional rebalancing and substitutions (as set out in the CNDM) to ensure the CP2030 Action Plan is delivered.

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

- Projects which receive Gate 1 terms meet the Gate 2 criteria in the future.

2.111. To deliver the permitted capacities for 2035 set out in the CP2030 Action Plan, one or more of the following must happen:

- NESO carries out regional rebalancing and substitutions (as set out in the CNDM).
- Projects which receive Gate 1 terms meet the Gate 2 criteria in the future.
- Projects for under-supplied technologies are developed in due course and receive a Gate 2 offer.

2.112. Aside from solar, there is only undersupply of capacity for certain technologies in the Gate 2 queue where there is already an undersupply of that technology in the queue overall, or where projects for that technology which currently hold a connection agreement are not expected to meet the readiness criteria. This highlights areas where more investment and policy support is needed to deliver the CP2030 Action Plan. It sends a clear signal for where developers should invest to alleviate any undersupply and providing a route to enable projects to come forward and connect.

2.113. A key driver of these reforms is moving projects that are not progressing to the Gate 1 queue and minimising the oversupply, thereby freeing up network capacity which can be used to connect undersupplied technologies more quickly. As set out in more detail in the next section (Impact on network build and connection dates), clear prioritisation of network capacity and build, is necessary to reach the pace of connection we need. Without it, combined with a connection process that allows needed projects to connect, it will be extremely challenging, likely impossible, to meet Clean Power 2030.

Breakdown of parties in the Gate 1 queue

2.114. The previous sections suggest that under TMO4+, a significant number of existing projects are likely to be given a Gate 1 offer due to being unable to meet the readiness criteria. There will also likely be a smaller cohort of ready projects that exceed the permitted capacities set by the strategic alignment criteria, that will similarly be moved to Gate 1.

2.115. Gate 1 is the provisional pipeline of future build and projects receive a conditional connection offer, with an indicative connection date and location. Combined with the clear process to move from Gate 1 to Gate 2, it can provide an effective mechanism for ready and needed projects to move ahead to get a firm connection offer. For the purposes of realising the benefits of efficient, rapid network planning and build, driving a faster pace of connections which connects the technology we need for Clean Power 2030 and to remain on track for net zero, it is likely to be effective. However, we recognise the importance of investment to Clean Power, the challenges of an indicative connection offer and the strong feedback from stakeholders on the balance of investment certainty between different segments of the queue and new projects. We have therefore carefully assessed the likely volume and profile of projects moved to the Gate 1 queue - recognising the inherent uncertainty as projects can and will change their status – under different scenarios and with a sensitivity. We examine the benefits and risks for investment from these reforms in a later section (Impact on investor confidence).

2.116. Table 24 below shows the capacity of projects that are assessed to 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 24: 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 in the future).

Technology	**Planning Submitted**	**Projects with land that do not have planning (submitted or obtained)**	**Projects without land or planning**	**Total (GW)**
Batteries	20.4	55.5	110.7	186.6
LDES	0.0	0.2	1.6	1.8
Solar	4.2	29.3	140.2	173.7
Onshore Wind	0.0	2.2	14.4	16.7
Offshore Wind	0.0	0.0	50.1	50.1
Unabated Gas	5.0	4.8	2.4	12.1
Low carbon dispatchable power	0.0	0.0	21.6	21.6
Nuclear	0.0	0.0	0.9	0.9
Interconnectors	0.0	0.0	16.7	16.7
Other Renewables	0.0	0.0	1.8	1.8
Total Capacity	**29.6**	**92.0**	**360.5**	**482.1**

2.117. We anticipate 360GW 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 would be early on in their development with limited resources invested in developing these projects, particularly as projects may also be speculative in nature.

2.118. We anticipate a further 122GW of projects that meet the readiness criteria would not meet the Gate 2 strategic alignment criteria. We estimate 92GW of this 122GW will have land rights but will not have submitted a planning application. The projects in this group are likely to be a mixture of projects, including those that are close to submitting planning applications and will therefore have invested resources into commencing the preparation of these planning applications, and some that have only secured land rights and not invested or progressed significantly beyond this.

2.119. We estimate 30GW of the 122GW will have submitted a planning application. Projects that fall into this category will be the most progressed of the unprotected project types, and are more likely to have invested in development activities including surveying, design, community engagement, and preparing planning applications. The technologies impacted are predominantly batteries, as well as some solar and unabated gas (although this category would be expected to be designated if required for security of supply reasons).

2.120. We undertook specific analysis to identify the estimated total number of solar and battery transmission specific projects (rather than overall capacities) which our analysis indicates would be moved to the Gate 1 queue. The set of tables on this can be found in Appendix 6: Removed Projects Data.

2.121. It has not been possible to do this for all technology types. For battery and solar however, it was possible to identify these projects as there were some categories (ie when grouped by planning status and region) where all of the capacity will be moved to the Gate 1 queue following the application of the readiness and strategic alignment criteria, enabling us to identify the likely affected specific projects

2.122. Where a certain grouping of technology type, planning status, and region is expected to have some capacity in Gate 2 and some capacity in Gate 1, it is not possible at this stage to determine which specific projects will be in Gate 1 versus Gate 2. This will only be possible on carrying out the complete queue formation exercise as specified in the Connections Methodologies. For

example, if only a portion of the capacity of solar projects with planning submitted in a certain region is strategically aligned with the CP2030 Action Plan permitted capacity, it is not possible for us to say which of these projects will be offered Gate 2 terms as this depends on NESO undertaking its queue formation exercise. Therefore, we do not attempt to estimate the number of removed projects for these categories.

2.123. Therefore, the estimated number of transmission projects shown in Appendix 6: Removed Projects Data. is very likely to represent an underestimation of the number of projects which will be in Gate 1. Nevertheless, this assessment gives an indication of the number and characteristics of transmission solar and battery projects that would be moved to the Gate 1 queue.[45]

2.124. This suggests that at least 626 projects in these groups are likely to be moved to Gate 1, which represents roughly 67% of all battery projects and 58% of all solar projects in the current transmission queue.

2.125. Overall, at least half of battery projects are likely to be given a Gate 1 offer, whilst all battery projects that we have classified as having land rights only are likely to be moved to the Gate 1 queue.

2.126. There are locational specific trends that are important to note. In particular, we estimate that no unconsented battery projects would receive a Gate 2 offer in Scotland. Thus, unless a battery project in Scotland is protected, it is unlikely to receive a Gate 2 offer.

2.127. In most regions of England, we estimate that there will be no battery projects with land rights and without planning consents submitted that would receive a Gate 2 offer. Therefore, battery projects that are not protected or have yet to submit a planning application would have a low chance of receiving a Gate 2 offer in this region.

2.128. We assess that 28% of solar projects with land rights are in a region where all solar projects of that type will not receive a Gate 2 offer. In particular, we estimate that in the Midlands, South England, and East Anglia

[45] The analysis of projects moved to Gate 1 does not include assessment of embedded projects due to granularity of the data used in our analysis for the distribution queue which is aggregated by technology type, and does not contain a list of individual projects.

transmission regions all solar projects with land rights only will receive a Gate 1 offer.

2.129. 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 some specific flexibility to rebalance zonal capacities and substitute between zones when carrying out the Gate 2 to whole queue exercise and making offers.

2.130. We acknowledge that some projects that are moved to the Gate 1 queue will have already incurred costs, such as connections application fees and investment in developing the project e.g. preparing planning applications.

2.131. For most technologies, our assessment suggests there will not be a significant proportion of, or any, projects that have land rights or have submitted planning applications moved to the Gate 1 queue on the basis of failing to meet the permitted capacities (Strategic Alignment Criterion (b)).

2.132. We estimate 30GW of projects have submitted a planning application but will not meet the Gate 2 strategic alignment criteria and will therefore be moved to Gate 1. These may have spent significant sums developing planning applications and therefore may be financially impacted by these reforms.

2.133. In principle, TMO4+ provides an opportunity to progress to Gate 2 through the gated process, but only where the CP2030 Action Plan capacities have not been met or exceeded. Where the strategic alignment permitted capacities are met / exceeded, projects that subsequently meet the readiness criteria will only 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 (regional or national depending on the technology type). Or,

- The permitted capacities for that technology / region are increased, for example, to reflect changes to the CP2030 Action Plan or the publication of the Strategic Spatial Energy Plan (**SSEP**).[46]

2.134. A large capacity of battery projects including batteries that have submitted planning, are unlikely to meet Gate 2 strategic alignment criteria, given the current volumes in the queue compared to the CP2030 Action Plan and the Future Energy Scenarios 2024 (**FES**) projection of 28-36GW of battery storage[47], We estimate that the national permitted capacities for batteries will be met, suggesting little need for rebalancing and that battery 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, e.g. through the SSEP.

2.135. Although some ready solar projects are expected to be moved to the Gate 1 queue, NESO has discretion to rebalance and substitute between zones. We note that the CP2030 Action Plan 2035 permitted capacities are set at 69.4GW compared to FES 70-108GW, so it is possible that – although this is largely contingent on the outcome of the first SSEP and must consider regional difference on need for this technology – that more solar capacity may be needed in future, compared to the CP2030 Action Plan 2035 permitted capacities.

2.136. Other technologies are materially less supplied, and therefore face a reasonably prospect of further projects entering the Gate 2 queue. In this context we note that there is 50GW of offshore wind without land rights expected to be moved to the Gate 1 queue. This represents a substantial portion of costs we estimate developers have invested on Gate 1 projects. If an offshore wind project does not have land rights, this means that it has either lost a seabed leasing round, in which case the loss in value is due to losing the leasing round or it has yet to enter a leasing round. If in future it was awarded in a leasing round, it will have a path to, and likely join, the Gate 2 queue. Therefore, we do not think ability of this offshore wind to proceed is determined by its connection under TMO4+, but instead depends

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

47 FES Documents | National Energy System Operator

on their success or failure to secure a Crown Estate or Crown Estate Scotland lease.

2.137. Projects that have progressed to submitting a planning application are likely to suffer a greater financial impact from these reforms. As such, conditional protections are included 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 permitted capacity for that technology has not been exceeded.

2.138. This protection is most likely to apply to solar projects, and in practice will mean that, where the CP2030 Action Plan permitted capacities are not met through the initial Gate 2 to Whole Queue exercise, any project currently holding a connection agreement and which receives planning consent in the future will receive a Gate 2 offer. In our view, this is a fair mitigation, as it protects projects that have already invested significant sums.

2.139. Finally, projects that have received planning consents now receive protected status and get Gate 2 offers. At first, NESO proposed for the connections reforms to be carried out without any projects receiving protected status. This would have meant significant capacities with planning consents would have received Gate 1 offers. The impacts of this can be seen in the Table 25 below.

Table 25: Estimated capacity of projects that could reach Gate 2 under our Medium scenario compared with the national CP2030 Action Plan 2035 permitted capacities for each technology and the estimated Medium Gate 2 capacity if no projects received protected status

Technology	**Medium (GW), protected status**	**Medium (GW), no protected status**	**2035 National permitted capacities (GW)**
Batteries	33.3	26.9	28.7
LDES	10.0	10.0	10.0
Solar	65.4	62.6	69.4
Onshore Wind	27.3	27.3	37.0
Offshore Wind	66.7	66.7	89.0
Unabated Gas	52.4	44.0	0.0
Low carbon dispatchable power	6.3	6.3	25.0
Nuclear	7.9	6.0	6.0
Interconnectors	21.7	21.7	24.0
Other Renewables	5.0	5.0	0.0
Total Capacity	296.0	276.5	289.1

2.140. Without protected capacities, it would result in the removal of well-developed nuclear (2GW) and unabated gas (9GW), which would harm investor confidence in technologies that are key for security of supply and low-carbon power, in the case of nuclear.

2.141. Our comparison also shows that there would be around 6GW less batteries in the Gate 2 queue if there we no protections for advanced projects, and around 3GW less solar. Although having no protections would deliver better

alignment with the CP2030 Action Plan, we think no protections would have a greater overall negative impact on the delivery of the CP2030 Action Plan by significantly undermining investor confidence, than removing protections for consented projects in order to seek to perfectly align the connections queue with the CP2030 Action Plan.

2.142. Finally, we have considered – and want to be transparent about - the inevitable limitations in the projections and data currently available (as noted earlier on in this section). We are particularly mindful of the uncertainties about attrition rates in Gate 2 and the opportunities that would provide for those in Gate 1.

2.143. Taking account of available mechanisms, we considered the risk to the energy system that TMO4+ moves projects to Gate 1 offers that later turn out to be necessary to deliver the CP2030 Action Plan, especially for those that are ready, but do not meet one of the strategic alignment criteria. For battery projects, we think the scale of the oversupply identified in Chapter 1 means the risk of moving battery projects to Gate 1 that later turn out to be needed is low, as there will be a sufficient pipeline of projects to fulfil any future under-supply. For unabated gas, if some or all of the Gate 1 capacity was identified as needed for security of supply, NESO could designate these projects, which would reduce the amount of ready unabated gas in Gate 1.

2.144. Overall, we consider the introduction of incrementally increased protections for more mature projects, and particularly protected status strikes a better balance between alignment with strategic need and investor confidence, to deliver efficient, rapid connections needed to and beyond Clean Power. As such, it strengthens the balance of benefit and is ultimately in the interest of consumers.

2.145. For the purposes of realising the benefits of efficient, rapid network planning and build, driving a faster pace of connections which connects the technology we need for Clean Power 2030 and to remain on track for net zero, moving to a system of two gates is likely to be effective. Gate 1 provides a necessary pipeline of future investment for Clean Power and beyond. For many technologies there will be clear opportunities to move to Gate 2. We do recognise stakeholder feedback on investment in Gate 1 projects, and we do assess that some technologies – most notably batteries – may not see the same volume of opportunity to move to Gate 2. Equally,

we note they may not have reached build and connection regardless, considering historic data on project attrition, and given the material oversupply of some technologies compared to likely to need. Under the status quo, network companies would have spent resources to develop network infrastructure that is unlikely to be needed, increasing energy system costs.

Data Sensitivity Check - Regen

2.146. As we have highlighted there are limitations to the data available now and consultation elicited a number of helpful responses on this area. Following that, we have carried out a comparison with publicly available data published by Regen as a sensitivity check against our assessment, to further understand the potential impacts of TMO4+ readiness criteria on the battery, solar, and onshore wind elements of the current queue.

2.147. In February 2025, following publication of the CP2030 Action Plan and final TMO4+ proposals, Regen published a data dashboard comparing Regen's estimate of the connections queue, and readiness status of projects, for solar, onshore wind and batteries.[48]

2.148. Regen state "The underlying data for this dashboard is from Renewable Energy Planning Database analysis, Nationally Significant Infrastructure (NSIP) and Energy Consents Unit (ECU) project registers, NESO Transmission Entry Capacity (TEC) register and DNO Embedded Capacity Registers (ECRs). These have been compared against the regional and national capacity totals for solar PV, batteries and onshore wind detailed in the CP30 connections reform annex." More details of the data sources used, and assumptions made can be found on the Regen dashboard website. We have used the Regen data as sensitivity case to our analysis using the NESO and DNO datasets. We believe that Regen dataset has the following benefits which makes it useful for comparison: Planning data from October 2024. This is more recent than the planning analysis Regen carried out for NESO meaning it likely contains more up-to date planning data.

[48] Regen: Connections reform - Clean Power 2030 strategic alignment

- Separates out capacity of different technologies that make up a hybrid site if data on the capacity split was present in the planning data sources.

2.149. A complete list of limitations of Regen's analysis can be found on the website, however key ones to highlight are:

- No access to RFI data and therefore limited information on whether a project has land rights.
- Includes capacity below Transmission Impact Assessment (TIA threshold) which will not be subject to TMO4+ or counted towards the CP30 permitted capacities.
- Co-located battery storage is likely to be undercounted, as many applications do not clearly specify the storage capacity in planning documents, or are still considering battery storage but have not yet made a final decision on whether a collocated battery will be present

2.150. Taking account of the benefits and limitations of Regen's data, we believe it a sufficiently reputable data source to act as a sensitivity case which mitigates some of the limitations of our own datasets and analysis.

Batteries

2.151. Through this sensitivity analysis, we find that we may have underestimated the number of batteries that have received planning consent compared to Regen. Our assessment is 22GW compared to Regen's 44GW. If Regen data is accurate, this would result in ~20GW more battery projects being 'protected' and receiving Gate 2 offers than our assessment shows. If this held true, this would result in the protected capacities exceeding the CP2030 Action Plan permitted capacities for battery storage (29GW in 2035).

2.152. Similarly, we have a lower estimate for the capacity of battery projects that have submitted planning that are likely to receive Gate 1 terms compared to Regen. Our assessment is 20GW compared to Regen's 31GW. The result of this is that, if Regen's data is accurate, a further 11GW of battery projects with planning submitted would be offered Gate 1 terms compared to our assessment. This does not change the number of projects moving to the Gate 1 queue in this sensitivity compared to our main assessment, but it

means some of those projects moved to Gate 1 are more progressed in this sensitivity, in comparison to the main assessment.

Solar

2.153. Similar to battery storage, we have a lower estimate of the capacity of solar projects that have received planning consent compared to Regen. Our assessment is 14GW compared to Regen's 20GW. If Regen data is accurate, this would therefore result in ~5GW more solar projects being 'protected' and receiving Gate 2 offers than we have assessed.

2.154. On the other hand, our assessment has a higher estimate for the capacity of transmission solar that have submitted planning and are likely to receive Gate 1 terms (~4GW), compared to the Regen data (~1GW). If Regen is correct, this means that we would be overestimating the readiness of projects moved to the Gate 1 queue, although we do not believe that this difference in the data affects the capacity of projects that will be in the Gate 2 queue. This does not change the number of projects moving to Gate 1 in this sensitivity compared to our main assessment, but it means some of those projects moved to Gate 1 are less progressed in this sensitivity, in comparison to the main assessment

Onshore wind

2.155. Finally, another significant difference between the result of analysis using Regen and NESO / DNO data, is the readiness of onshore wind projects moved to the Gate 1 queue.

2.72. In our assessment, we assess that 0GW of onshore wind projects that have submitted a planning application would be in the Gate 1 queue, compared to 4.2GW in the Regen data – all of this being in Scotland (a concern highlighted by some responses to our consultation).

2.156. To the extent that Regen's data is a more accurate picture of the current readiness of the queue, this means that TMO4+ will have more of a negative impact on onshore wind projects with a planning submitted than we have assessed. This does not change the number of projects moving to Gate 1 in this sensitivity compared to our main assessment, but it means some of those projects moved to Gate 1 are more progressed in this sensitivity, in comparison to the main assessment.

2.157. However, those projects that have submitted planning permission would have a good chance of moving into the Gate 2 queue in future if and when their planning application is approved, as they will be protected under Protection Clause 3, if they submitted the planning application prior to 20 Dec 2024, and based on current data it appears unlikely that the GB 2035 onshore wind permitted capacities will be met in the near term.

2.158. We have carefully considered whether the differing assessments highlighted by the Regen data, or other credible sensitivities, would change our assessment of the impact of readiness reform to a degree that would change our decisions.

2.159. Some uncertainty over the future impact of any reform of this sort is inevitable, as projects will progress through the development pipeline, eg more projects having progressed to planning consent in the time since NESO compiled its data and the decision date as well as inherent limitations in the accuracy of data. This is inherent to this decision making.

2.160. We therefore consider whether the scale of uncertainty could change the right decision to reach. If the numbers provided by Regen were a more accurate guide, the most significant difference to Gate 2 is that the capacities of battery storage that meet the protected criteria may exceed the CP2030 Action Plan permitted capacities. More generally, we must accept there is some risk that other, or different, technologies might be able to exceed permitted capacities although the combined findings of our and Regen data suggest this is less likely to be very material. Whilst an oversupply in Gate 2 could reduce some of the anticipated package benefits that these reforms are expected to deliver, we are satisfied that our decisions to approve the reforms remain robust to such sensitivities. More particularly, we are satisfied that an oversupply in the sort of volumes suggested by this sensitivity are sufficiently small in the context of the total size of the queue and anticipated benefits that our decision to approve this package of reforms would not be affected by them. Given that the alternative would be to loosen protections for advanced projects, which we believe would go too far to undermine investor confidence, we do not consider that alternative to be appropriate.

2.161. The other impact of this sensitivity is some differences to the Gate 1, shifting the overall volume and balance of maturity of the projects although

with some changes pulling in different directions; onshore wind moving to Gate 1 is more progressed in this sensitivity than in our assessment but it shows less battery, and less mature solar as moved to Gate 1. Again, we are comfortable that our assessment of benefits and disbenefits remains robust to these sensitivities and potential variances against the estimates set out in this impact assessment.

Conclusion

2.162. The queue under the status quo connections contains a mix of technologies that do not align with the CP2030 Action Plan, in some cases far in excess of what is needed.

2.163. The CP2030 Action Plan sets out a national and local technology mix chosen by Government. Better enabling this mix to connect more rapidly should, in the view of the NESO, reduce the cost of constraints and deliver faster carbon emissions reductions compared with the status quo. Under 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.

2.164. Our analysis shows that applying TMO4+ criteria to the current connection queue will result in a streamlined Gate 2 queue and a wider indicative Gate 1 queue, which will together better deliver a pipeline of generation and storage technologies in line with the CP2030 Action Plan. The revised Gate 2 queue will far closer align with what is required per the CP2030 Action Plan, and to the extent there is any shortfall in a technology the new process will more effectively and transparently create the opportunity for that technology to come forward and connect either from Gate 1 or directly. This will enable better focused investment and we expect the NESO to run the Gate process so that it provides meaningful insight - technology and location - over where there may be opportunities to invest and for where network should be built.

2.165. We see the proposed protections as providing a reasonable balance between delivering the benefits of a strategically aligned queue, while reasonably protecting investor confidence. 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, provide further sensible flexibility to achieve the overall benefits of an aligned, queue which maximises existing investment. Rebalancing in particular will allow for NESO to keep the regional permitted capacities where sensible and make adjustments in response to an evolving queue in order to keep the grid aligned to the broader goals of achieving Clean Power by 2030. 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.

2.166. Nonetheless, all projects have made some financial investment, and this could be more material for the small proportion that have submitted planning applications. We weigh up the trade-offs for investment in more detail at below ('Impacts on investor confidence') but as set out there consider the enduring benefits to investment material and important. We also recognise the risk that some projects who receive a Gate 1 offer are later needed but consider the mechanisms NESO has within the codes to address any unintended consequences, and the mechanism to review and update the Connection Methodologies, which we assess as reasonable mitigations.

2.167. 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 covered 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. We do not think retaining the present approach can deliver the pace of connections required for Clean Power 2030 and the trajectory for net zero, nor will it do so at the most efficient cost to the consumer.

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

Impact on network build and connection dates

Overview

2.169. TMO4+ will 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. We expect two key benefits for network built and connection date:

- **More efficient network planning and build**. Implementing the TMO4+ package of reforms will introduce a new connections process aligned with focused, prioritised network build. This impact is explained in more detail in this section, but in summary network companies will have improved clarity on the projects that are 'ready' and 'needed' and will not need to plan to build network for an unrealistic and uncertain pipeline of projects, many of which will not progress to construction and energisation.
- **Faster connections rate**. Implementing the TMO4+ package of reform and prioritised build will enable networks to deliver a faster rate of connections. This impact is explained in more detail in this section, but in summary network build (enabling works) needed for connections can be approved and progress more quickly and projects that receive Gate 2 terms can also progress more quickly due to their increased confidence that their connection date will not be varied.

2.170. The key network impacts supporting these core benefits are:

- More efficient network planning due to the implementation of a 'Gate 2 queue' with increased credibility arising from the application of Readiness Criteria and Strategic Alignment Criteria, and the introduction of co-ordinated network design exercises following batched application windows.
- More long-term investment certainty for both networks (resulting from a more ready, strategically needed pipeline of projects) and customers (resulting from more certain network plans)
- Accelerated delivery of network expansion and connections. This derived from a range of factors including more efficient planning, a more credible queue, and the ability to bring forward similar projects to those which exit the queue.

- Avoided network expenditure from more focused and efficient network build.
- A risk of costs associated with abortive work carried out by network companies associated with projects that do not meet Gate 2 criteria.

The status quo is increasing uncertainty

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

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

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

2.174. 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).

2.175. 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 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.

2.176. 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 delays in connection dates for the non-progressing projects, which can drive knock-on delays for other projects impacted or projects reliant on subsequent reinforcements that experience knock-on delays. Under the status quo, network companies account for some uncertainty around the needs case for reinforcements driven by connections; this is one of the reasons behind the potential for abortive costs (see section below) through the implementation of the TMO4+ reform package.

2.177. Network companies have different ways to manage uncertainty. Under the status quo the current queue, although unrealistic to deliver in its totality, constitutes a firm contracted background and there is no consistent systematised way to differentiate between projects that are more or less likely to proceed to construction and energisation. This means that NESO and the network companies are balancing two imperatives that sit in tension and have become unsustainable. In theory, network companies need to build the entire network down to substation for the entire queue even though this is unrealistic and not feasible. In practice, network companies use 'Construction Planning Assumptions' to account for the fact that so many projects in the current queue will not connect. The scale of the queue means these assumptions are no longer sufficient; this is leading to slower action to plan, build and deliver connections.

2.178. If we did not progress with the TMO4+ reform package, network companies would need to continue to plan and build in the context of this high uncertainty. If network companies were able to significantly increase the rate of network build based on the build signal provided by the current queue (which we see as extremely challenging, likely impossible), it would lead to an inefficient use and waste of network resources progressing new network infrastructure that may not be utilised or may be in sub-optimal locations. The result of this inefficient build would be higher network charges than necessary to cover network costs, including the consumer share of network reinforcement associated with unviable or not needed projects.

2.179. Finally, we note that the clear need reinforced by multiple consultation responses is not simply to achieve the connection pace implied by the current queue, but to enable new projects to connect in acceptable timescales. This is important for investment in demand projects (driving

growth) and for delivering needed technologies to achieve our national decarbonisation goals. Driving to achieve acceleration under the status quo will very materially exacerbate all of the issues outlined above. For the purposes of this assessment we have, however, used the status quo as the best source of specific information.

Connections reform will reduce uncertainty

2.180. Under the TMO4+ reform package, applying Readiness and Strategic Alignment Criteria will give network companies greater certainty as to which projects in the connection queue will ultimately connect. In addition, planned network build in alignment with the capacities in the CP2030 Action Plan will give network companies increased confidence that, if 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 permitted capacities in the CNDM, or through an alternative project receiving a Gate 2 offer in the next window.

2.181. The increased certainty network companies will have with a smaller, rationalised pipeline aligned with strategic plans such as CP2030 Action Plan, will 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. As set at the beginning of this section, we acknowledge that in practice networks are already trying to prioritise and increase certainty before reinforcement works are put forward for approval. However, this is challenging and the high level of uncertainty in the status quo leads to slower, less certain planning and network build, with risks of unnecessary network build and expenditure.
- 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.

2.182. The above actions will very likely lead to more efficiently focused network build and therefore lower cost network delivery with estimated tens of billions in savings in avoided network costs, of which we estimate £5 million would be non-attributable.

2.183. 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. When the TMO4+ reform package is implemented, and the connections pipeline closely aligns with the CP2030 Action Plan, the process of investment approval will be further streamlined.

2.184. In addition to increasing network investment certainty, by offering Gate 1 terms to projects that are insufficiently ready and/or not aligned with CP2030, TMO4+ will result in capacity being released to be utilised by projects which remain in the connections queue. We expect this is likely to result in accelerated dates, particularly for projects with dates post-2030.

Transmission

2.185. We asked the TOs to assess the impact that TMO4+ 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 Appendix 2, we have summarised the approach used by each TO and their findings.

2.186. 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 upon the implementation of the reforms.

Impact on Network Build

2.187. Applying Gate 2 criteria to the existing queue will result in projects that are either insufficiently ready or do not align with the CP2030 Action Plan

permitted capacities (or are not otherwise protected[49] or deemed to meet Strategic Alignment Criteria) receiving Gate 1 offers. Projects with Gate 1 offers 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 offers. Gate 1 projects will be earlier in development and/or not strategically aligned with the CP2030 Action Plan. Accordingly, the application of Gate 2 criteria will reduce the need for network build required to connect customers, which lowers costs and avoids building unnecessary reinforcements, and enables more focused network build. This section contains estimates for the reduction in reinforcement works for the three transmission owners.

2.188. National Grid Electricity Transmission (NGET) estimates that 185 non-attributable reinforcement projects worth a total of £4.7bn (costs that would be borne between customers and consumers), to be removed due to the introduction of the TMO4+ reform package. They also find that 532 (out of 774) unique contractual connection substation sites[50] could be impacted, with two-thirds of these projected to no longer have any connections associated with them, which at a very high level could have an attributable notional investment cost in the tens of billions of pounds

2.189. Scottish Power Energy Networks (SPEN) assess that 25 reinforcement projects are 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).

2.190. Scottish and Southern Electricity Networks Transmission (SSEN-T) find that 38 reinforcement projects are no longer needed for customer connections following the application of Gate 2 criteria to the whole queue and expected that most reinforcement projects would also be partially impacted. The

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

[50] 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

notional investment cost of these 38 works is £2.35bn (of which £0.28 bn is non-attributable).

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

2.192. This freed-up capacity will result in one of two outcomes:

- avoided network reinforcements/costs; or
- if reinforcement works are assessed as needed due to other strategic drivers, this increased network capacity will likely facilitate faster connections for other parties seeking connection in future than would have been possible under the status quo+.

2.193. In totality, there are approximately £5 billion of avoided non-attributable reinforcement works. As this does not cover every TO (as not all provided their estimate), we are potentially underestimating the total savings. We have focused on non-attributable works where there is a direct link to savings for consumers, however avoided attributable works, with a notional cost in the tens of billions of pounds, also allows investment capital to be better directed and improves network efficiency.

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

2.195. 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 is likely to improve efficiency in allocating investment in the energy system.

2.196. Accordingly, TMO4+ and the application of Gate 2 criteria will 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.

2.197. Taken together, this will (compared to the status quo) encourage investors to direct resources to where generation and storage is needed according to strategic plans (starting with the CP2030 Action Plan).

2.198. To summarise the total costs of non-attributable costs that TMO4+ is forecasted by TOs to avoid is approximately £5 billion, simply to achieve the connection of the current queue. 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 tens of billions of pounds.

Connection date accelerations

2.199. 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
- deliverability of the project seeking to connect
- network outage availability
- interactions with other connection customers

2.200. 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.

2.201. However, one of the key outcomes of the reforms is the timely delivery of connections for projects aligned with the CP2030 Action Plan. Implementing the TMO4+ reform package will mean that viable projects are highly likely

to connect sooner, where the system needs them, without unnecessary costs to consumers.

2.202. TMO4+ will not by itself resolve issues around how quickly network companies can build network capacity and connect users to the network, but reform is needed to enable these benefits. Also, until there is certainty as to parties that will meet Gate 2 criteria, and a follow up design exercise inclusive of power system modelling, it is not currently 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.

2.203. 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 may result in acceleration of projects in some scenarios but would not always result in accelerated dates for other Gate 2 projects in every case. The reasons for this are multifactorial but capacity constraints would 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.

2.204. On balance, a more credible pipeline of projects in the Gate 2 queue will improve connection dates for new applicants seeking connection and that are needed to meet the 2035 permitted capacities in the CP2030 Action Plan.

Distribution

2.205. We consulted the DNOs on their view of how TMO4+ would impact their ability to plan and build the network, and the costs or cost reductions associated with the TMO4+. The information they provided, and our subsequent analysis of this information is qualitative rather than quantitative but is nonetheless relevant to understanding the likely impact of the TMO4+ reform package.

Impact on Network Build

2.206. As TMO4+ raises the minimum requirements for obtaining a Gate 2 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.

2.207. DNOs stated that having a more credible and certain pipeline of projects will allow the DNOs to review previously identified reinforcement to determine if it is still required or can be reduced, which could diminish the amount of network build needed for new connections

2.208. The majority of the DNOs indicated that there will likely be costs associated with re-studying the network based on the Gate 2 Queue, including the need for electrical engineering resources, and the pricing of any reinforcements that can be made at points of connection.

2.209. The DNOs stated that many distribution customers are currently subject to constraints through the Transmission network, with long lead dates being driven for wider Transmission reinforcement. As such, the amount of reinforcement needed at the Transmission and Distribution interface would largely depend on the make-up of the Gate 2 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

2.210. 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 state that if projects in the queue driving network build (ie the Gate 2 queue) are ready to progress, the process of designing and building the network will move at a faster pace. This will ultimately contribute to a reduction in overall project timescales.

2.211. TMO4+ will reduce the number of battery and storage projects in the Gate 2 queue. DNOs have identified that these technology types currently contribute to import and export constraints at distribution level, and as such, these constraints will be minimised by reducing the number of battery and storage projects in the Gate 2 queue and ultimately connecting.

Interaction between Network build and Clean Power by 2030

2.212. 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 high uncertainty driven by the current queue.

2.213. TMO4+ will reduce these risks by issuing Gate 2 connection agreements to those who meet Gate 2 Criteria. For the majority of projects, this will mean being sufficiently ready and meeting Strategic Alignment Criterion B in the proposed Gate 2 Criteria Methodology, which aligns with CP2030 Action Plan permitted capacities.

2.214. When applying the Gate 2 criteria to the queue, NESO will consider capacity in two-time phases, 2025-2030, and 2031-2035.

Attrition

2.215. NESO do not propose to increase the permitted capacities for each technology above the permitted capacities stated in the CP2030 Action Plan, to account for any potential project attrition, i.e. projects that obtain a Gate 2 offer, but then subsequently do not meet Queue Management Milestones and are terminated, or those that self-terminate.

2.216. We acknowledge that some respondents to our consultation made the case for increasing the permitted capacities in the CP2030 Action Plan. In response to our consultation, one way that respondents proposed to mitigate the risk of projects needed for Clean Power by 2030 exiting the Gate 2 queue and not being replaced, is to increase the capacity of projects which receive Gate 2 terms above the maximum capacity specified in the CP2030 Action Plan. Our accompanying publication "Decision: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment" and the Decision on the Gate 2 Criteria Methodology set out our reasons not recommending attrition and our expectations on when this stance should be reviewed. While a lack of attrition is a key risk associated with TMO4+ that we will monitor, the following points summarise our position:

- The CP2030 Action Plan contains permitted capacities to 2035. This provides a contingency over what is needed for 2030 for most technologies.

- We need to connect approximately 100GW to achieve Clean Power by 2030. Excluding built capacity, the Gate 2 queue will have far more capacity than this due to inclusion of 2035 capacities (the medium case is c.175GW) which mitigates the need for attrition.
- Projects can be accelerated or reallocated into capacity gaps created by projects which are terminated. Projects that are in Gate 1 can also fill gaps if they successfully apply at the next window and are offered a Gate 2 offer.
- Substitution between adjacent and overlying zones can be used to fill capacity gaps in the same technology class.

2.217. Connecting 100GW per year equates to a connection rate of about 20 GW per year. That is going to be a challenge based on the average annual rate of connections delivered for the six years up to April 2025 being approximately 8GW per year. However, without TMO4+, this ambitious connection rate would be even higher and an accelerated rate will not be achievable. This in in part because 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.

2.218. 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, both by maintaining the current pre-2030 dates for those in phase 2 (2031-2035), and by accelerating those in phase 2, currently with dates post-2030. 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 potentially exiting the queue before 2030 and the 2035 permitted capacities in the CP2030 Action Plan.

2.219. However, the need for attrition to be otherwise accounted for in the connection process, 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 stance on attrition. In doing so, NESO should consider whether its Connection 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 permitted capacities are likely to receive pre-2031 dates once network company implementation plans are more developed. Overall, the TMO4+ connections reform is required to deliver Clean Power 2030. Without connections reform, it will be at best extremely challenging, likely impossible, to deliver the number of connections required (and associated network build) to achieve Clean Power by 2030.

Risk of abortive network works

2.220. Implementing TMO4+ will have an impact on network plans with TOs likely to identify network reinforcements that will no longer be needed. Where TOs have already incurred costs for network reinforcements associated with projects that have been moved to the Gate 1 queue 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. These are referred to as 'abortive works'.

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

- The number of projects that are provided Gate 1 offers.
- 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 or used at a later period

2.222. 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.

2.223. Under TMO4+, users holding a Gate 1 agreement, including users from the existing queue with Gate 1 offers, 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 the Gate 1 queue will have their securities returned by the NESO (as they are no longer liable for the TO works). Therefore, there is a risk that TMO4+ results in TOs having

carried out abortive work for projects that are now in the Gate 1 queue, 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. The exact cost cannot be estimated precisely until the process.

2.224. 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[51] spend over the same period October 2025-March 2026 of £8.5 billion. The reason for the comparatively low range is because under TMO4+ the projects most likely to be provided with Gate 1 offers 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 expected that they would be less reliant on network reinforcement as they will 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. 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 from consumers. As referenced above, the established process is that if reinforcements are underway or completed and a connections customer cancel, that customer is then liable for a cancellation charge or NESO draws on the security. Waiving liabilities for connections customers that are provided a Gate 1 offer would mean that NESO pays the relevant TO and recovers this amounted via the Transmission Network Use of System Charges (TNUoS) demand residual.

2.225. 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

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

Local Asset Reuse Factor (LARF)[52] 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.

2.226. 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 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 eg strategic network reinforcements, such as through the ASTI process. The cost was therefore estimated with the more strategic schemes/costs removed from the estimation to provide an indicative abortive cost range. 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 the Gate 1 queue and the Gate 2 queue.

2.227. 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. Now that TMO4+ is approved, we will work closely with companies to scrutinise costs and ensure these are minimised where possible. We expect to gain a better understanding of these risks following the closure of the Gate 2 to whole queue application window, and will monitor these impacts through the subsequent redesign exercise carried out by the TOs.

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

2.228. Under existing arrangements, these could potentially be recovered via TNUoS in 2027/28. If this were to be the case, it is estimated that this would result in an increase in annual standing charge of £2.82-£12.33 for one year. However, we will monitor the level of abortive costs and will explore mitigations, as appropriate, including spreading the cost of multiple years. The impact of this on different domestic consumer types is assessed in the next section (Impact on consumers).

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

2.230. As TMO4+ is implemented, it is important that any potential abortive costs are closely monitored to ensure consumers are getting the best value for money from network companies, and that any impacts to consumers are mitigated.

2.231. Ofgem will 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

2.232. 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.

2.233. 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.

2.234. Transmission owners estimate their costs of implementing Gate 2 to whole queue to be £35million, and DNOs estimate their costs to be £17million.

2.235. 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.

2.236. NESO estimate the increase in operating costs to implement TMO4+ to be £8 million (compared to an approximate total BSUoS cost of £3.54bn[53]), which we would expect to be recovered in FY 2026/27 BSUoS charges. This equates to an approximate £0.03 /MWh [54] increase in electricity unit prices.

Conclusion

2.237. The status quo creates a disconnect between the contracted capacity in the connections queue and the reality of the energy mix needed to meet GB demand and deliver Clean Power by 2030. This creates the dual risks of slow network build and connections as networks try to manage the uncertainty the status quo creates, and of inefficient network build as networks try to meet all stated connection requirements.

2.238. Each risk is material. The rate of connections to the network will need to increase significantly to approximately 20GW[55] on average between 2025-2030.

2.239. Connections reform is needed to enable Clean Power 2030 to be delivered and for this rate to be feasible. Additionally, without reform to the connections process and considering the historical connections rate (the average annual rate of connections delivered for the six years up to April 2025 was approximately 8GW per year), it would take approximately 42 years to connect all the projects in the current queue (prior to reform) with pre-2030 dates, with this problem further exacerbated beyond 2030.

2.240. As well as the historical rate of connections being far too slow to achieve Clean Power by 2030, there is a material risk that the status quo does not allow the right mix of projects to be connected in time. TMO4+ makes it more feasible, although still challenging, that the necessary rate of connection can be met and the required mix of projects connected by 2030. Networks estimate that they can avoid approximately £5 billion in costs that

[53] 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

[54] Based on a chargeable volume of 270TWh

[55] 219GW capacity required for 2030 minus 119 GW built capacity, to be delivered over the next 5 years.

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 deliver. This cost avoidance is driven as part of delivering a more certain and credible pipeline of projects aligned with the CP2030 Action Plan.

2.241. The financial costs of these reforms as a whole are proportionate and justified as compared to the overall benefits of the reform which are set out in "Decision: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment". In relation to network build specifically, the cost of abortive works will be materially below the value of avoided network build costs detailed in this section. Nonetheless, these costs will be carefully monitored and mitigated.

Impacts on Consumers

2.242. 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).

2.243. 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.

2.244. 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 CP2030 Action Plan:

- 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 flatten 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.

2.245. In addition, NESO advice concluded that if CP2030 Action Plan 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. 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. Clean Power by 2030 is in the consumer interest as it would 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.

2.246. TMO4+ enables the timely delivery of connections aligned with the CP2030 Action Plan, and as such is expected to realise the aforementioned benefits

Policy Costs

2.247. As described above, applying the TMO4+ process to the existing queue will 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 'Summary Decision Document: 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, will avoid costs related to 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.

2.248. We have identified the following costs associated with the implementation of TMO4+ which will 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 sections of the network no longer require or re-usable following 'Gate 2 to whole queue'.

2.249. NESO have estimated the costs of the network re-design to be £8million. This would 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. We recognise that DNOs will also likely have implementation costs to be recovered.

2.250. NESO and TOs have estimated the abortive works to be in the range £220million - £960million. Under existing arrangements, these could potentially be recovered via TNUoS in 2027/28. If this were to be the case, it is estimated that this will result in an increase in annual standing charge of £2.82-£12.33 for one year. However, we will monitor the level of abortive costs and will explore mitigations, as appropriate, including spreading the cost of multiple year. As discussed in the previous section, DNOs anticipate zero or very low abortive costs arising from these reforms.

2.251. We also recognise that significant sums (estimated between below £1bn to below £3bn) have been expended by investors in developing projects that are expected to receive Gate 1 terms.

Distributional Impacts

2.252. 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:

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

2.253. We have also had regard to the Public Sector Equality Duty in reaching this decision. Our assessment is that the costs associated with the changes are relevant to those with the following protected characteristics: age and disability, as considered further below. Individuals with low incomes and those residing in rural areas are also included in our assessment below as, although not recognised as protected characteristics, we are required to specifically have regard to the interests of such consumers in accordance with S3A(3) of the Electricity Act 1989. For other protected characteristics such as race, religion and sexual orientation, we have not identified any potential for discrimination or adverse impacts as a result of the reforms.

2.254. We have concluded:

- Any increase in the standing charge would be borne by all consumers equally, given charges do not vary with usage. The analysis below considers how this may specifically affect the relevant groups identified above.
- For costs that would result in higher volumetric charges (eg implementation costs passed through BSUoS) those consumers with higher than average consumption would experience higher gas and electricity bills from the changes. This could include retirees or those with certain disabilities.
- 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 these specific groups would need to devote to the higher standing charge. This is why we have identified that there is an impact on consumers with respect to age and disability.

2.255. 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.

2.256. 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%.

2.257. 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 26: 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 17: Savings in energy spend as a % of income for different consumer types and income deciles (lower scenario)

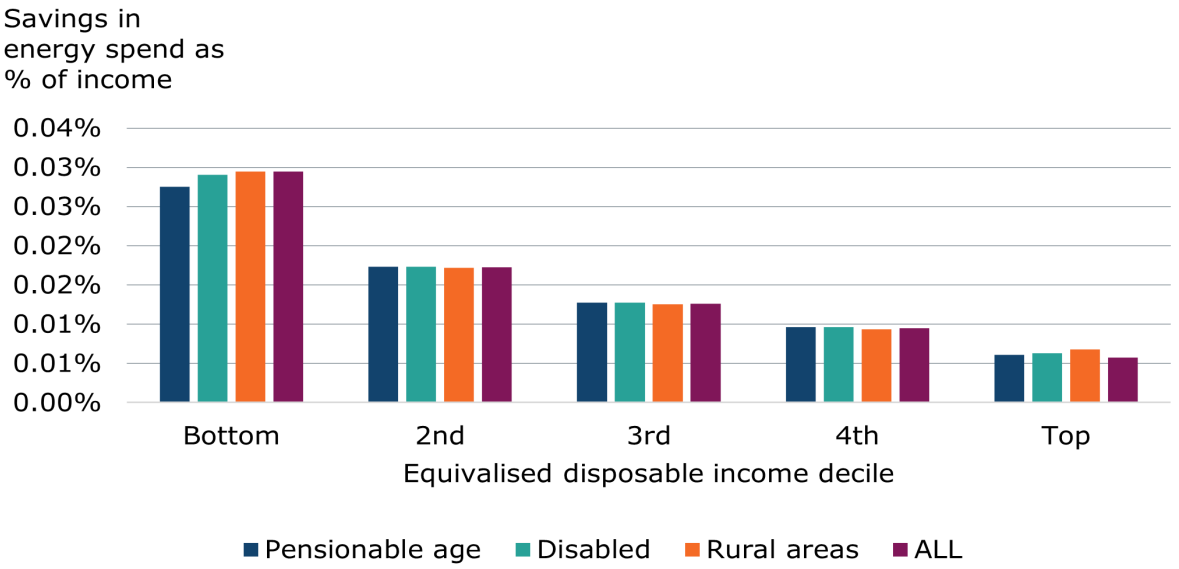


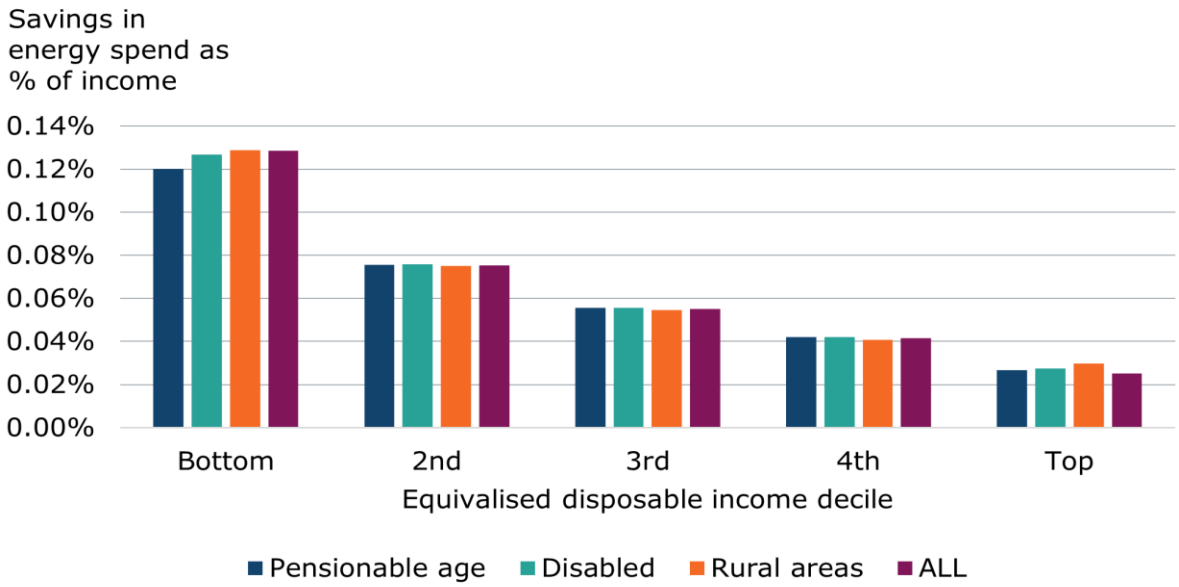
Table 27: Higher cost scenario – electricity direct debits

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



2.258. 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.

2.259. 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.

2.260. 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:

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

2.261. 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.

2.262. 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.

2.263. 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)

2.264. 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).

2.265. 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 28: 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 29: 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

2.266. 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 would seek to mitigate these costs by minimising the amount

of works classified as abortive by TOs through encouraging sensible re-use of network assets.

2.267. 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 would have a relatively higher impact on lower income households. As set out in the previous section, we will monitor the costs incurred, particularly where resulting costs are at the higher end of the expected spectrum, and we will explore mitigations, if appropriate, to lessen the impact of costs to consumers, particularly lower income households, including spreading the cost over multiple years.

Other statutory duties

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

Competition

2.269. Ofgem carries out its functions in a manner it considers best calculated to further the principal objective, wherever appropriate, by promoting effective competition[56] 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.[57]

2.270. 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.

2.271. 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.

2.272. Once a generation, storage or demand 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.

2.273. 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. Under the status quo the

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

[57] Section 3A (2) of the EA89

connection date operates as a material barrier to some projects (and an advantage to others) which limits the scope of this competition.

2.274. TMO4+ aligns the connections process with the CP2030 Action Plan by restricting which projects can receive a grid connection agreement (with a firm connection date and location) to those within the permitted capacities specified for each technology type in the CP2030 Action Plan. In doing so, Ofgem is discharging its principal objective of protecting consumers interests, in particular, 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) as provided in s. 3A EA89.

2.275. Restricting the connections queue in this way might nonetheless be said to introduce a risk to competition in the market, potentially placing 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 see potential benefits to competition of a smaller pool of higher quality (viable and ready) projects competing with each other to progress quickly.

2.276. The counter-risk under the status quo is that no project will move forward faster than its connection date reasonably justifies. This issue is encapsulated by the situation of renewable generation projects that must enter a Contract for Difference (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.

Impacts to competition in the CfD

2.277. CfDs are contracts that give revenue certainty to renewable generators by guaranteeing a price for the electricity they generate and are the primary route to market for renewable generation in GB. CfDs are funded by consumers. CfD auctions are carried out annually, with all winning generators receiving the highest of the winning strike price bids, when the auction clears.

2.278. 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,

therefore we have assumed that a Gate 2 agreement will be required in future.

2.279. The 'readiness' criteria in the Gate 2 Criteria Methodology is 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.

2.280. 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 will be required to enter a CfD auction. There will necessarily be fewer such agreements in total than the current number of connection agreements in the existing queue, although our readiness assessment highlights that this may not be the case when considering only those that meet the readiness requirements of a CfD auction. Less competition in the auction could result in a higher CfD clearing prices, and ultimately higher costs for consumers.

2.281. TMO4+ rules will 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 foresee that TMO4+ will have any negative impacts on the number of participants in the AR7 auction.

2.282. When NESO consulted industry on the Connections Methodologies for the reformed connections process, one point of contention was the 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. Some respondents argued that including all 'ready' projects, rather than restricting to those that meet the strategic alignment criteria, will increase competition in those auctions and therefore deliver better outcomes for consumers.

2.283. 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.

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

- NESO has proposed to use the highest capacity from the permitted capacities specified in the Government's CP2030 Action Plan, meaning that more capacity will be issued a Gate 2 grid connection agreement than will be needed in any one scenario from the CP2030 Action Plan. This protects projects exceeding permitted 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 (as there are permitted capacities set out to 2035) means that these projects will need to compete for support, for example CfD and Capacity Market capacity. 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, NESO will order projects based on their planning status. This means that the projects most likely to be eligible to compete in future CfD auctions will 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 the Gate 1 queue.
- As per the licence changes, NESO will be obligated to review the Connections Methodologies at least annually to assess whether any changes are required. In addition, Ofgem will have the power to trigger a review of the Connections Methodologies at any point. These provisions will enable quick interventions to be made in the event there are 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 permitted capacities.

2.285. 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 a key limiting factor for which projects can enter a CfD competition.

2.286. Given the risk outlined above of undersupply in renewables due to unreadiness, we highlight the value of TMO4+ in better providing a route to enable existing and new projects which are ready to get timely connection dates. If TMO4+ delivers faster connection dates for ready projects that remain in the queue, or for new projects, it is also possible that there could be greater competition in CfD auctions.

2.287. 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 Market competition

2.288. 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.

2.289. 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.

2.290. The last Capacity Market auction was in March 2025 and issued capacity market contracts for the period 2025/26 (T-1 auction) and 2028/29 (T-4 auction). Any projects that were successful in this auction are protected.

2.291. The dates of the following Capacity Market auctions 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.

Economic Growth

2.292. 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.

2.293. 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.

2.294. Demand users seeking a connection to the transmission system do not have any permitted capacities in CP2030 Action Plan. Therefore, all demand demonstrating sufficient land rights will be eligible to receive a Gate 2 connection offer.

2.295. Demand is automatically deemed as needed, in that it is deemed to meet the strategic alignment criteria. We think from data from NESO and the network companies that there is approximately 17GW of demand projects at Transmission and 25 GW at distribution, totalling 42GW across the combined queue. From the RfI, responses from transmission-connecting demand projects indicate that approximately 8GW of projects will receive a Gate 2 offer and 11GW of projects will receive a Gate 1 offer due to readiness, totalling 19GW. Whilst the total capacity numbers don't exactly tally, likely due to underlying data assumptions, the RfI does at least highlight that around 40% of demand projects at transmission are likely to receive a Gate 2 offer. Any demand project will be able to move from Gate 1 to Gate 2 by meeting the readiness criteria as per Section 3.1 of the Gate 2 Criteria Methodology. The impact on demand is primarily discussed later on in one section for simplicity (Impact on demand projects).

2.296. We recognise that at this point not all demand projects will move to Gate 1, as not all demand projects yet have land rights. Given that all demand is deemed needed, once a project can demonstrate readiness it will be able to move to Gate 2. We note some feedback from some demand projects on potential challenges in obtaining land rights before obtaining a connection; we discuss this in our section on demand and in Gate 2 Criteria Methodology decision but do not consider this materially impacts on growth or outweighs the benefits to other economically important demand projects, or the wider benefits ensuring the Gate 2 queue, which provides the basis for network planning and build, is made up of reasonably committed, mature projects.

2.297. By moving both demand and generation projects that are not ready to the Gate 1 queue, as well as generation projects which do not align with the permitted capacities in the CP2030 Action Plan, capacity is expected to be released so that those projects that are ready and meet strategic alignment criteria are likely to receive accelerated connection dates if requested.

2.298. 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.

2.299. In exceptional circumstances, demand projects that are critical for system operability or materially reduce system constraints 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 economic growth, although we may look to explore this further with the Government and NESO.

2.300. 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.

2.301. The TMO4+ reform package will give a strong signal to developers about where to invest and as a consequence 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.

2.302. In its CP2030 Action Plan, the Government outlined the many ways that clean energy industries supported by the plan will contribute to economic growth[58], 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.

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

- 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.

Wider Impacts

Environmental impacts[59]

2.303. TMO4+ will have an impact on the electricity generation mix used in Great Britain, thereby directly influencing carbon emissions from electricity generation.

2.304. 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+.

2.305. TMO4+ is designed to align the current connections queue with the permitted capacities specified in the CP2030 Action Plan. DESNZ expect that delivering a clean power system will 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.[60]

2.73. If the status quo was maintained, there will be a significant risk that the Clean Power by 2030 will 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 is likely to lead to increased need for gas generation to manage security of supply and system operability issues.

2.306. By contrast, by approving TMO4+, this delivers a new reformed connections process which is key enabler for delivering Clean Power by 2030, and the

[59] 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.

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

low-carbon generation this plan requires, and ultimately to be on track for net zero by 2050.

2.307. In addition, TMO4+ will 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.

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

Impacts on investor confidence

2.309. 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. The scale of investment to deliver Clean Power 2030 is significant. DESNZ and NESO have stated that there is £40bn of average annual investment to realise Clean Power 2030, made up of £30bn in generation assets and £10bn in transmission network investment. Very material investment will continue to be needed beyond this, in line with future strategic energy plans.

2.310. The status-quo has some material negative impacts on investor certainty for both those in the queue, and those looking to join it, and on the companies responsible for directing investment in the networks:

2.311. 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. Without reform the need for a roughly 5-fold increase in the rate of connections compared to the historical rate means we expect this uncertainty to continue to grow over the coming years. For investors seeking a new connection, the scarcity of existing grid capacity and size of the existing queue to connect undermines certainty on

where and when they can connect. Connection dates being offered for new projects are in the late 20230s running into the 2040s, meaning investment will not be delivered for a long time, if at all, with capital potentially being redeployed to other countries as a result.

2.312. Networks, who are expected to invest in excess of £100bn in the networks over the next decade, have low certainty as to which projects will be progressed to completion and when. Their consultation responses reinforce that they struggle to prioritise their own investment in their networks.

2.313. These issues need several co-ordinated policy interventions to be resolved (such as those contained in the TAAP, CAP, and our end-to-end review of the connections regulatory framework), but TMO4+ is an integral part of this package. TMO4+, by filtering the connections queue based on readiness criteria and aligning the connections queue with the CP2030 Action Plan, gives a strong signal about whether projects are needed, increasing investor certainty and better enabling the focus of investor capital by both connecting projects and networks.

2.314. Aligning connections with the Government's CP2030 Action Plan ensures the connections queue and 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 including by the Government pursuant to its duties under the Climate Change Act 2008. 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. In our initial Impact Assessment we suggested this would deliver more certainty on where to focus investment for generation/storage projects seeking to connect, therefore positively impacting on investors' confidence in the long term. In response to a policy consultation on the Connections Methodologies, generators have signalled that alignment with long term strategic planning (beyond 2030) would provide investment certainty.

2.315. Reform will mean that demand (transmission-connected demand, and indirectly, distribution-connected demand) will see a materially shorter connections queue in many locations. Demand projects that are ready (and all demand is deemed needed) will therefore be more likely to receive improved dates especially where they can adapt to take advantage of

capacity coming available. Demand consultation responses support our minded-to view that current delays in connection dates are a material concern, and improvements will materially reduce the risk of investment going to other countries.

2.316. As set out in Chapter 2, networks have provided analysis showing that under reform the level of network build required will reduce. This will allow networks to focus their own investment where it is most needed, and - to the extent that the reform allows networks to also minimise enabling network build costs – it reduces the level of investment connecting projects must put into network. Whilst not quantified in the Impact Assessment, this is expected to result in savings of tens of billions of pounds, of unnecessary network costs associated with the current queue.

2.317. We consider that all (demand and generation) investors and developers with projects that receive a Gate 2 offer will have more trust in connections contracts that are awarded in line with strategic plans due to coordination of policy and industry efforts to deliver these plans, and the greater likelihood that the connection offers can be depended on (see 'network' chapter above). 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.

Investment uncertainty during the reform transition

2.318. We highlighted in our draft Impact Assessment the risk of a period of investment uncertainty while this connection reform is being considered and (if approved) the 'Gate 2 to whole queue' process is delivered. We heard consultation feedback that this risk of an investment pause must be taken seriously especially for projects that are close to completion. Existing protections were welcomed, but consultees highlighted the protections for projects due to connect in 2026 and stated they should be extended to projects due to connect in 2027. We therefore recommend to NESO methodology changes in our Gate 2 Methodology decision to extend the protections for those projects due to commission in 2027 with planning consent, to maintain the same connections date and location. We also recognise the importance that the upcoming CfD Auction Round and Long Duration Storage and have worked across Ofgem and with DESNZ to

confirm that applicants can enter as normal. We expect NESO to keep this under review.

2.319. These are strong mitigations which protect the specific groups most likely to be affected. In addition, we have an agreed timeline with NESO and network companies to ensure that those receiving Gate 2 terms connecting sooner will get their Gate 2 offer sooner in the process. This is to ensure that these projects are given sufficient clarity in advance of their project build stage to avoid hiatus. We therefore conclude that the – mitigated – risk of investment uncertainty during the reform transition is acceptable and materially less than the benefits of reform.

Investment impact on those receiving Gate 1 offers

2.320. We recognise that reform will move some projects to the Gate 1 queue, and our assessment of the evidence on this by technology and maturity is set out in section 2. above. 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 £1bn to below £3bn. Of this, we expect approximately 33% to have been spent on the projects which have submitted a planning consent application, which makes up 6% of the projects that would move to the Gate 1 queue. The data that has informed this decision, including the estimates above, are necessarily uncertain but the best we have been able to establish and, overall, we are assured in relation to NESO's assessments of them. Amongst other things, they are necessarily dependent on the actual readiness of projects, which will be confirmed when NESO undertake the Gate 2 to the whole queue exercise. It is also dependent on the extent to which NESO rebalances zones and substitutes at transmission and distribution. Should the number of projects that have submitted a planning consent application given a Gate 1 offer prove to be lower than estimated, we would expect to see the overall development expenditure associated with projects moved to Gate 1 to significantly decrease. As we highlight and describe throughout this document and others, even given those uncertainties and even if the costs lost were around the top end of that range, we are still satisfied this is right decision to take now for energy consumers.

2.321. To protect projects and investments that are well developed, TMO4+ provides protections to ensure any existing project with planning

permission, an awarded Capacity Market, Cap and Floor Agreement, or CfDs contract is deemed to have met the Gate 2 Strategic Alignment Criteria. The impact of this on the Gate 1 and 2 queues is set out earlier in Chapter 2, and we agree this is a proportionate step, as these projects are sufficiently well-progressed that it would be disproportionate and inefficient to move them to the Gate 1 queue. Projections are in place for projects that have applied for planning consent, to be able to subsequently move to the Gate 2 queue. The level of protection depends on when planning consent was submitted and we have recommended a simplification to ensure similar treatment across the different regions of Great Britain.

2.322. Gate 1 is not automatically a signal not to invest, it is a stage in the development of the project. The Gate 1 queue is the provisional pipeline of future build, and replacement for any projects that do drop out (including from the Queue Management Milestones). TMO4+ is explicitly designed to enable ready and needed projects to be brought into the Gate 2 queue and gain timely connections.

2.323. The full breakdown of the capacities per technology moved to the Gate 1 queue is set out in Chapter 2 above where we examine in detail the impact on specific groups and locations. When considering the impact on investment, we note that a number of technologies are undersupplied, meaning that there is have relatively high likelihood of projects subsequently moving to the Gate 2 queue if they can meet the readiness criteria. We acknowledge that this is not the case for all technologies and, considering the permitted capacities out to 2035 for battery storage and the current size of the queue, the route to market for future battery storage projects including those initially placed in the Gate 1 queue is likely to be limited and primarily focused on replacing terminated battery projects within the horizon of the current energy plan.

2.324. Investors will make their own judgement about how far they are willing to invest while in the Gate 1 queue, informed by locational and technological outlook. Consultation feedback from some parties states that this will be limited, and that they may not be willing to invest in some projects beyond the development already funded. We considered carefully whether we have fully captured this risk to investment, taking account of both the broad consultation response comments and some specific examples provided. Equally, we note feedback from some companies that hold multiple

connection offers that their usual practice is to develop multiple projects to some degree, then reduce the number of projects they take to final investment decision.

2.325. Being in Gate 1 is likely to broadly reflect the present-day reasonable investment outlook for projects, accepting that all projects face individual judgement and circumstances. If there was no reform, we still see a probability that many of these projects might not proceed to FID. In particular:

- **Project readiness:** A significant number of projects do not have land rights, meaning they are not at all progressed. In the status quo, these projects would have had to obtain land and planning rights - and do so in time to meet all the Queue Management Milestones - to avoid project termination. For example, 113GW of projects are required to meet the Land Rights Milestone in 2025 or face termination. A high proportion of projects never achieve planning, for example through dropping out or through not achieving consent from the relevant authority. This is compounded by the fact that portfolio players hold multiple connection offers and as per usual development these parties will reduce the number of projects they take to final investment decision. If readiness is the driver for being in the Gate 1 queue, hitting the readiness milestones will allow the project to move to the Gate 2 queue.
- **Project route to market:** To invest, projects will need a viable route to market to receive revenues. Absent any reform, the earlier projects to connect and energise will, all being equal, eventually reduce the prices in the relevant markets, which may lead later project investors to decide not to proceed. The fact that some projects that are materially progressed would remain in the Gate 1 queue due to not meeting Strategic Alignment criteria, reflects the current mismatch between the connection queue and likely energy system/market needs. The TMO4+ approach of accepting queue order once other readiness criteria are met has a broad parallel in the likely order these projects would have reached the market (or not) if they all remained in a single 'first ready first connect' queue.

2.326. 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.

2.327. 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 would 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 offer would receive only a Gate 1 offer with an indicative connections date. In the context of TMO4+, we are seeking to help investors manage that risk by being as clear and transparent in our decision-making process as possible.

2.328. On balance we find that rationalising 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 consider it is important that developers know where and when to invest in generation and storage, and that this investment is aligned to the CP2030 Action Plan and other strategic plans, in order to realise the wider benefits of connection reform. We assess that this reform will increase confidence to make this investment. The ultimate value of these new connections is anticipated to be materially greater than the development costs committed by those projects that are expected to be moved to the Gate 1 queue. We consider that the potential impact reform could have on investor confidence in the short term are reasonably mitigated by NESO's protections provided reforms are implemented rapidly and transparently. While we recognise the concerns raised by stakeholders on investment in projects in the Gate 1 queue, and given the other uncertainties facing these projects, we do not consider they outweigh the increased investor confidence that would 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.

2.329. 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

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

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

2.332. 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 would 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.[61]

2.333. NESO will use the minimum of the Transmission Entry Capacity (TEC) and the installed capacity for each technology type comprising a hybrid or 'co-located' project. This will mean that certain project configurations which can better utilise network capacity, such as oversizing of generation and export management with battery energy storage, will still be possible and not overly inhibited by TMO4+.

2.334. 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. TMO4+ could therefore prevent certain innovative business models and hybrid project configurations from being developed.

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

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

2.336. As per the licence changes consulted, 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 e.g. when the first SSEP is published.

2.337. 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 would contribute to the CP2030 Action Plan capacity.

2.338. 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

2.339. Technologies that are not included in the CP2030 Action Plan would not have any restrictions on the capacity or location that can connect (strategic alignment criteria (d)[62]. We therefore do not see any negative impact of TMO4+ reforms on these emerging technology types compared with maintaining the status quo.

2.340. 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.

Treatment of Hybrid projects in our assessment

[62] Section 6.3 Gate 2 Criteria Methodology.

2.341. In the NESO dataset, and for the purpose of our assessment comparing queue capacity to the CP2030 Action Plan permitted capacities, hybrid projects have been classified to a single technology e.g. hybrid solar and battery projects being classified as solar.

2.342. DNOs have included hybrid projects in the capacities for the relevant technologies where known. SSE provided capacity for hybrid solar and battery projects.

2.343. The potential issue with the approach taken in the NESO dataset is that it may incorrectly assign all the grid capacity for a project to a single technology type, whereas some or all of that capacity may need to be assigned to different technology type for the purposes of TMO4+ queue formation.

2.344. Some respondents to the consultation, also raised concerns that the impact of the TMO4+ reform package on hybrid projects, specifically stating their concerns that the original Impact Assessment did not accurately account for the benefits of these projects.

2.345. Upon further analysis, our conclusion is that while there is a risk that solar and battery hybrid projects may be misclassified, our sensitivity analysis does not demonstrate that this is likely to be the case. Therefore, there is no obvious change to our Impact Assessment calculation methodology required. We have also considered the potential underestimate of planning submitted battery storage receiving Gate 1 offers within our assessment.

2.346. It is possible that there is a misclassification of hybrid projects which include onshore wind in our assessment, which could be over-estimating the total capacity of solar in the queue and underestimating the total capacity of onshore wind in the queue. Our assessment finds a small capacity impact, and therefore we do not see this as having a material impact. It therefore does not change our conclusions on the impacts of the relevant technologies.

2.347. More detail on this can be found in *Appendix 5: Data Sensitivity Check.*

3. Uncertainty and associated risks

Data on the current queue and determining the queue resulting from reforms

3.1. As recognised throughout this Impact Assessment, and through the responses to our consultation, there are inevitable limitations in the projections and data currently available and therefore the ability to determine the future queue size and composition, as we explain in detail in Chapter 2. We have sought and considered views on TMO4+, including a sensitivity check of our underlying data on batteries, solar and onshore wind, and have taken them into account throughout our assessment.

Estimating impact on network and date accelerations

3.2. NESO and network companies carried out a 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.

3.3. We have therefore used 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 would 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.

3.4. 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.

3.5. 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

3.6. As noted in Section 2, there may be a cost to consumers due to the 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 the Gate 1 queue 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 the Gate 1 queue and even if they were, we would expect the network reinforcement would be more easily re-used by other Gate 2 projects.

3.7. The primary benefit to consumers comes via delivery of the CP2030 Action Plan, which we think TMO4+ would 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.

3.8. 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.

3.9. However, we do note concerns expressed by respondents to the consultations on the CP2030 Action Plan but we believe that because TMO4+ enables the timely connection of projects aligned with the CP2030 Action Plan permitted capacities for 2030 and 2035, as well as aligning with future strategic energy plans to enable the realisation of net zero by 2050, this will accelerate the reduction of our reliance on fossil fuels, improving

security of supply and protecting consumers from exposure to any future gas price spikes. We also consider that TMO4+ will deliver wider benefits, which include lowering consumer bills through cheaper generation, and reduced system costs both through avoided network build and anticipated reduction in constraint costs.

Impact on individual projects and customers

3.10. 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.

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

3.12. This means that we have not been able to assess the precise impacts TMO4+ would 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.

3.13. We are also unable to assess the impact of TMO4+ on which projects might come into the queue in the future due to the extremely speculative nature of any such exercise.

4. Monitoring and Evaluation

Section Summary

This section sets out our plan to monitor and evaluate the impacts of our 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 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 decision documents, based on the information available we consider 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 As the reforms are implemented, we will continue to monitor the emerging information and impacts closely. We are particularly mindful of the uncertainties about attrition rates in the Gate 2 queue and the opportunities that would provide for those in the Gate 1 queue. TMO4+ 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.

4.3. Below is our formalised Monitoring and Evaluation strategy.

4.4. We will 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 permitted capacities as 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.

4.5. We will 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+.

4.6. We would closely monitor for any emerging unintended 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 offer.
- 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 achieve Clean Power by 2030.
- Reduced competition in relevant markets.

4.7. When monitoring and evaluating impacts during implementation we will work and engage with key stakeholders including, NESO, Network Companies, Developers, and utilise existing industry forums to monitor and report on impacts (eg, Connections Delivery Board, Connections Process Advisory Group, Strategic Connections Group, the Implementation Hub, and other relevant governance established).

4.8. We will collect initial evidence after NESO has closed the Gate 2 to whole queue evidence window and assessed evidence in July 2025. If required, we will collect evidence and data during the network companies study time period in Autumn 2025. We will gather evidence on updated connections offer dates in Q1 2026. We will also ensure that the relevant tracking of enabling network build for connections to enable Clean Power 2030, is appropriately collected and input in to wider Clean Power 2030 delivery governance.

4.9. As per proposed licence conditions governing the Connections 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 Connections Methodologies in April 2026 include an initial impact of the assessment of TMO4+.

4.10. We anticipate that we will carry out an Impact Evaluation in 5 years' time, in 2030.

Appendices

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Appendix 1: Consultation Analysis – Impact Assessment

Impact Assessment (Q11–16)

Q11: Do you agree that we have, to a reasonable extent, identified and understood the potential impacts of TMO4+, including in particular the impacts on size and makeup of the queue and network build and connection dates?

1.1. In this section, we summarise consultation responses received to for Q11 – Q16 of our minded-to consultation. Given overlapping themes in the responses to each question, Ofgem's overarching response follows at the end of the summary of responses for each question.

Summary of stakeholder responses:

1.2. 41% of respondents did not respond to Q11. 21% of respondents said that the Impact Assessment had captured the impacts of TMO4+ to a reasonable extent, with 6% non-committal. 32% of respondents said that the Impact Assessment had not fully captured the impacts of TMO4+.

1.3. Amongst the respondents who agreed, some particularly agreed with our arguments that the current queue would become unmanageable without TMO4+. Those who agreed also thought that our exercise broadly captured the likely effects of TMO4+ on the queue.

1.4. The following areas of concern were raised.

1.5. **CP2030 Action Plan:** A key theme emerging from the responses was regarding the negative consequences of forming the electricity connections queue based upon the permitted capacities stated in the CP2030 Action Plan, and the subsequent impacts that flowed through the Impact Assessment based on that approach. Multiple users indicated the Gate 2 permitted capacities in CP2030 Action Plan did not reflect the reality of the current development pipeline and highlighted the risk that CP2030 Action Plan permitted capacities would not be delivered due to attrition, suggesting that the permitted capacities should be increased to account for this.

1.6. With regards to the Impact Assessment itself, some respondents noted that the potential impact on investment, due to the uncertainty and sunk costs

created by the CP2030 Action Plan permitted capacities, was not appropriately captured by the Impact Assessment.

1.7. **Data:** Some respondents also highlighted concerns with the data and analysis on the Gate 2 and Gate 1 queues presented in our Impact Assessment. These issues can be summarised as follows:

- Overestimation of built capacity for different technologies.
- Overestimation of Solar PV capacity in the queue, and overestimation of the capacity of Solar PV that has submitted a planning consent.
- Underestimation of the amount of battery capacity in the queue.
- Underestimation of the amount of onshore wind in the queue, and the amount of onshore wind that has either obtained planning consent or has submitted a planning application – with specific implications for projects moved to Gate 1 in Scotland.

1.8. **Additional points:** Some concerns were raised about the TOs' and DNOs' ability to deliver Gate 2 offers within the allocated time, with a number of those noting that the effects of TMO4+ on the connections queue could not be fully understood until the Gate 2 to the whole queue (G2TWQ) exercise has been carried out and that impacts of reform on the distribution grid are uncertain.

1.9. In addition, some concerns were raised about the impact of the TMO4+ reform package in Scotland, commenting that there would be a disproportionate impact on community owned energy projects in Scotland as the threshold for Transmission Impact Assessment in Scotland is much lower than in England and Wales.

1.10. Finally, comment was made by a small number of respondents that although impacts on the supply side (generation) had been well understood, they believed that impacts on demand users, in particular, data centres had not been understood stating that the requirement to demonstrate land rights would impact on data centre development.

Q12: Do you agree that we have, to a reasonable extent, captured and understood the potential impacts of TMO4+ on different user types, including generation, storage and demand customers across transmission and distribution, as well as consumers, NESO and network companies?

Summary of stakeholder responses:

1.11. 39% of respondents did not respond to Q12. 21% of respondents said that the Impact Assessment had capture the impacts of TMO4+ to a reasonable extent, with 3% of non-committal. 37% of respondents said that the Impact Assessment had not fully captured the impacts of TMO4+.

1.12. Many of the respondents who agreed said that they thought our evaluation had been comprehensive and accurately covered different type of users of the grid.

1.13. The following areas of concern were raised.

1.14. **Distribution Projects and DNOs:** This was a key theme that emerged from the responses. Respondents raised a number of concerns including:

- the lack of transparency on the process at the distribution level.
- that DNOs would not be able to meet their delivery commitments.
- that the assessment of third party works would delay receipt of Gate 2 offers to an undeterminably length of time for affected users.

1.15. **Hybrid Projects:** Some respondents noted the impact on hybrid projects and on the repowering of projects, particularly onshore wind, had not been fully considered in our impact assessment. Furthermore, some respondents criticised the rules surrounding hybrid projects, and the negative impacts the TMO4+ reform package would have on these project types. A few respondents also raised the impact of the TMO4+ reform package on co-located projects, stating the Impact Assessment did not accurately account for the benefits of these projects.

1.16. **Projects with a 2027/28 connection date:** As noted as a key theme across a number of questions in the consultation, respondents expressed concerns about the impact on projects with a 2027 or 2028 connection date, which is discussed in more detail in Theme 1: Calls to extend protections to more advanced projects in 'Decision – Gate 2 Criteria Methodology'.

1.17. **Additional Points:** A small number of respondents expressed concern that the readiness criteria would have a specific impact on data centres, stating that the rules risk stifling development of data centres and reducing investment in this sector.

1.18. As per responses to Q11, some concerns were also raised that the impact of TMO4+ reform package would have on community energy projects in Scotland, with a particular concern raised how more than 60% of community owned wind in Scotland is expected to need to repower before 2035.

1.19. A small number of respondents also expressed concern about the impact of the TMO4+ reform package on the CfD auctions, stating that having fewer wind projects receiving Gate 2 offers would lead to fewer wind projects participating in the CfD. Concerns were raised that this would push up the cost of CfD contracts to unsustainable levels.

1.20. Further concerns, as throughout all responses to the consultation questions, were raised about the CP2030 Action Plan permitted capacities.

1.21. Lastly, a small number of respondents stated that the Impact Assessment did not accurately capture the impacts of the TMO4+ reform package on interconnector projects, as some interconnector projects are effectively stagnant and will be prioritised over projects with less developed planning/land rights that are much more viable due to governmental support in partner countries.

Q13: If you are a developer who has one or more connection agreements that may be affected by TMO4+, do you have feedback on how your contract may be affected and what impact this would have on your business? Please provide as much detail as possible (including confidentially if desired), including as to the likelihood of being affected (positively or adversely); the reasons for this (e.g. opportunities for acceleration, failure to meet Gate 2 Criteria); and the extent of any likely or potential financial or other impact.

Summary of stakeholder responses:

1.22. 48% of respondents provided a response or partial response to Q13, whilst 52% did not respond.

1.23. Responses ranged from speculation on the industry-wide effect to a small number providing some confidential project data.

1.24. Some respondents highlighted that the reforms would allow certain projects or broader portfolios to connect more quickly or with more certainty.

1.25. The following areas of concern were raised.

1.26. **Cost:** This was a key theme that emerged from the responses to Q13, with most respondents noting that the TMO4+ reform package would result in some degree of sunk costs, although some said some of their project portfolio would benefit from acceleration.

1.27. **Projects with a 2027/28 connection date:** As noted as a key theme across a number of questions in the consultation, discussed in detail in Theme 1: Calls to extend protections to more advanced projects in our 'Decision – Gate 2 Criteria Methodology', respondents also expressed concerns about the impact on projects with a 2027 or 2028 connection date, with particular regard given in Q13 about projects having to hold off commencing construction until they receive a Gate 2 offers, leading to negative impacts on the projects and achieving Clean Power by 2030.

1.28. **Investment:** Some respondents also raised concerns about the impact on investment uncertainty that the TMO4+ reform package process is having and delays to projects even if they expected to receive Gate 2 offers.

1.29. **Additional points:** Other respondents stated that they would be unlikely to progress Gate 1 projects, and one user stated that their project would be adversely impacted by TMO4+. User stated that projects moving to Gate 1 and no-longer being progressed would result in lost investment, and some users stated that they would likely invest the capital assigned to these projects elsewhere including in other countries. Users responding to say that TMO4+ would prohibit them from further developing projects including renewable generation developers, battery energy storage developers, and data centre developers**.**

Q14: Do you agree that we have, to a reasonable extent, identified and understood all the potential costs of implementing TMO4+?

Summary of stakeholder responses:

1.30. 46% of respondents did not respond to Q14. 17% of those that did respond stated that the Impact Assessment had captured the costs of TMO4+ to a reasonable extent. 36% of those that did respond stated that the Impact Assessment had not fully captured the costs of TMO4+, with 1% non-committal.

1.31. Respondents who agreed thought we had captured the costs of TMO4+ well in an environment of inherent uncertainty.

1.32. The following areas of concern were raised**.**

1.33. **Costs:** Concerns were raised about the Impact Assessment not fully considering the costs being faced by developers being moved to Gate 1. In addition, developers and DNOs also stated that the Impact Assessment underestimated the costs of network reinforcement.

1.34. **Investment:** Many respondents considered that the Impact Assessment had not fully captured the effects of reforms on investor confidence and in bringing uncertainty to the sector.

1.35. **Projects with a 2027/28 connection date:** As noted as a key theme across a number of questions in the consultation respondents also expressed concerns about the impact on projects with a 2027 or 2028 connection date.

1.36. **Data Centres:** As per responses to Questions 11 and 12, a small number of respondents expressed concerns that the impacts on data centres had not been understood stating that the requirement to demonstrate land rights would impact on data centre development, with specific regard given here to that this would increase the cost of data centres.

1.37. **CfD:** As per response to Question 12, respondents also expressed concerns about the impact of the TMO4+ reform package on the CfD auction, particularly regarding the potential for TMO4+ to raise the prices of CfD contracts.

1.38. **Additional Points:** Many respondents highlighted the impact of reducing the pool of people with Gate 2 offers would have on Contracts for Difference, Capacity Market prices, and supply chains.

1.39. One user stated that they do not believe any battery would be installed in 2027 and believe it may be too late to rectify. They suggested that NESO should bring forward date for issuing Gate 2 connection dates as soon as possible, ideally May 2025.

1.40. Scottish Power Energy Networks stated that Ofgem should further consider how network operators are recompensed for the additional work required to deliver the 'Gate 2 to whole queue' exercise.

1.41. A small number of responses, as noted in other questions, raised concerns that the Impact Assessment had not assessed the impact on community owned projects, with particular regard given in response to this question on

the reduction of economic benefits for those communities and the increased risk of fuel poverty in local communities.

Q15: Have we, as accurately as possible, identified and understood all the potential benefits of implementing TMO4+?

Summary of stakeholder responses:

1.42. 62% of respondents did not respond to Q15. 31% of respondents stated that the Impact Assessment had captured the benefits of TMO4+ to a reasonable extent. 7% of respondents said that the Impact Assessment had not fully captured the benefits of TMO4+.

1.43. Many respondents agreed with our broad appraisal of the benefits, particularly in terms of aligning the grid to CP2030. Some respondents added that the exact magnitude of these benefits remains very uncertain.

1.44. One respondent noted in response to Q15, that in their view acceleration would be harmful and encourage the entry of speculative development offers on the chance that they could be accelerated.

Q16: Are there any unintended consequences of TMO4+ that we have not identified?

Summary of stakeholder responses:

1.45. 38% of respondents did not respond to the question. 55% of respondents stated that there were unintended consequences of TMO4+ that we had not fully identified. 7% of respondents stated that the Impact Assessment had captured all consequences of reform.

1.46. Overall, respondents, as highlighted in the answers to the other Impact Assessment questions, expressed concerns that there were likely to be unintended and unidentified consequences due to the TMO4+ reform package.

1.47. The following areas of concern were raised, although not necessarily with regard to the Impact Assessment itself.

1.48. **Investment:** Many respondents also stated that the Impact Assessment had not fully captured the effects of the TMO4+ reform package on investor confidence and how it is bringing uncertainty to the sector. Some respondents also stated that they believe that the TMO4+ reform package,

and the period of uncertainty over the course of its development, has resulted in a decrease in investor confidence, and will result in a 1-2 year hiatus in new battery projects being built.

1.49. In addition, similar to responses to the other questions on the Impact Assessment, a small number of respondents expressed concerns that the TMO4+ reform package does not incentivise investment in new renewable generation beyond 2030, particularly in Scotland. This was followed by a general theme of some of those responses stating concerns that there was a disproportionate impact from the TMO4+ reform package on Scottish projects and those subject to the Scottish planning system.

1.50. In addition, some respondents also stated that the Impact Assessment hadn't considered the intersection of the TMO4+ reform package with zonal pricing proposals, in particular, and REMA, creating uncertainty in the industry that could chill investment.

1.51. **Gate 2 to the whole queue:** This was one of the key themes expressed in response to Q16, with concerns raised about the deliverability of Gate 2 to the whole queue process, specifically concerns about:

- NESO resources and expertise to carry out readiness and strategic alignment criteria checks and process.
- TO resources required to re-work connection offers.
- the lack of an appeals process for Gate 2 decisions, and the risk that projects are subject to an incorrect decision and, therefore, disadvantaged by having to wait to the next Gate 2 window.

1.52. **Data Centres:** As per responses to Questions 11 and 12, a small number of respondents expressed concerns about the impact of the TMO4+ reform package on data centres, with particular regard given to concerns that it will inhibit development of new data centres, having a knock of impact on economic growth, and the roll out of new technologies in UK. Linked to this, a small number of respondents expressed concerns that this could lead to a loss of inward investment in the UK for data centres and AI, slowing adoption of digital products and services in the UK.

1.53. **CfD:** As per response to Question 12 some respondents also expressed concerns about the impact of the TMO4+ reform package on the CfD market, with particular regard in this question given to CfDs being awarded to higher

and/or more expensive projects due to the lack of CfD entrants driving up energy bills.

1.54. **Data:** Concerns were raised around how the Impact Assessment underestimated solar projects in the full queue and that legitimately viable solar projects will not be given Gate 2 offers in favour of other technologies which may not progress as expected.

1.55. **Other policies in the TMO4+ Reform Package:** There were some general concerns expressed about the policies contained within the TMO4+ reform package. For example, some respondents were concerned that projects seeking advancement may not legitimately be capable of achieving the advanced date, but in seeking advancement could negatively impact other Gate 2 projects.

1.56. Some respondents also stated that they felt that the TMO4+ process is inconsistent at transmission and distribution.

1.57. A small number of respondents also expressed concerns that the TMO4+ reform package incentives developers to submit planning applications, which could result in poorer quality planning applications and stressing an already stressed system. The implication was made by some that this risks shifting the problem of connection delays to the planning system rather than the connections queue.

Ofgem response:

1.58. All responses have been considered in advance of our final decision and taking these into account we find that the Impact Assessment provides a robust calculation of our best view of the impacts, costs and benefits that expected to arise from these reforms. Fundamentally, there has not been a change to the overall picture of impacts in comparison to the Impact Assessment published with the Minded-to position. Therefore, the Impact Assessment demonstrates that these reforms are needed and have the expected impacts.

1.59. In summary, we are clear that we have analysed various alternatives through this process, including those suggested to us in response to the Minded-to, and have set out many of them, and our response to them, throughout these documents. We do not consider there are any reasonable alternatives that carry meaningfully lower risk and cost and that could deliver the same policy outcome of an urgent and fundamentally reformed process, which achieves the GB-wide benefits we have identified, including in support of Clean Power by 2030, in a timely manner.

1.60. Detailed responses to many of the issues raised by respondents and how we have made changes are covered elsewhere in the suite of Decision documents. However, we have included a non-exhaustive list below for completeness pertaining to the specific Impact Assessment questions.

1.61. **CP2030 Action Plan:** TMO4+ proposes that the connections process aligns with the CP2030 Action Plan. The Impact Assessment does not assess the impacts of the Government's CP2030 Action Plan save insofar as it feeds directly into the content and impact of TMO4+.

1.62. The CP2030 Action Plan is one of the means by which the Secretary of State is to deliver these obligations under the Climate Change Act 2008 (including achieving net zero by 2050 and delivery of five year carbon budgets). Ofgem's principal objective in protecting the interests of consumers includes their interests in the Secretary of State's compliance with those obligations.

1.63. The CP2030 Action Plan improves the national and local technology mix in several key ways. Better enabling this mix to connect more rapidly should, in the view of NESO, reduce the cost of constraints and should deliver faster carbon emissions reductions compared with the status quo. Under 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.

1.64. Our overarching document 'Summary Decision Document: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment' provides further policy context.

1.65. Attrition: Considering the use of maximum ranges for 2030 in the CP2030 Action Plan Connections Annex, the inclusion of 2035 capacities which can receive connection dates before 2030, and the protections for well-advanced projects, our view is that the CP2030 Action Plan can be implemented through the Connections Methodologies without additional attrition in the connections process. We acknowledge that there is low or no uplift from 2030 capacities to 2035 capacities in the case of storage and onshore wind in Scotland. In the case of onshore wind, the capacity ranges allow for a doubling of onshore wind capacity in Scotland between 2025 and 2035. In the case of storage, the application of protections is likely to result in far more battery projects in the queue than the capacity range for 2035. Increasing 2035 capacity allocations for any technology would reduce the scope for the SSEP to optimise the future network.

1.66. Please see 'Decision: Gate 2 Criteria Methodology' for a detailed response, and this is also addressed in Q10 in the overarching document.

1.67. Solar capacities: As detailed in the Impact Assessment (Chapter 2, CP2030 Action Plan solar capacities) and Appendix 4 – Amalgamation of Solar Zones, the Government updated the Connections Reform Annex of the CP2030 Action Plan on 7 April 2025 to address a misalignment between solar capacity allocations and the solar pipeline for 2031-35. The amalgamated transmission and distribution zones for 2031-35 allow for the permeability requested by some respondents.

1.68. The key impact of combining the transmission and distribution zone permitted capacities (ie what has changed compared to our Minded-To Impact Assessment) is that increased solar capacity is expected to receive a Gate 2 offer, up from approximately 39GW in the medium scenario in our original Impact Assessment, which strictly applied transmission and distribution

permitted capacities, to 65.4W when applying the new combined permitted capacity. This is material positive, in that it provides a Gate 2 queue much closer to meeting the 69.4GW permitted capacity for 2035 in the CP2030 Action Plan.

1.69. Also, following the amalgamation of solar transmission and distribution zones, we expect that comparably fewer solar projects that have submitted a planning application will be moved to the Gate 1 queue, down from 19GW to 4GW. This is a positive impact; in that it reduces any negative consequences for a large pool of advanced solar projects which may have invested in preparing planning applications.

1.70. **Data:** As set out in detail in Chapter 2, in particular, and Chapter 3, we have acknowledged there are limitations in the projections and data currently available (with regards to built capacity and planning in particular).

1.71. 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 data can be found in the NESO impact assessment report and their Impact Assessment Databook.

1.72. 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, as explained in Chapter 2, we believe it is the best data available at this time. We have sought and considered views on TMO4+, including a sensitivity check of our underlying data on batteries, solar and onshore wind with publicly available data published by Regen, and have taken them into account throughout our assessment. Whilst noting the uncertainties, we are comfortable that our assessment of benefits, costs and impacts of TMO4+ remains sound.

1.73. Within our analysis, we consider the feedback on whether we have over-estimated built capacity for different technologies. We assess that we likely have c.15GW, however, the majority of this would be protected and receive a Gate 2 offer, meaning the difference in assumption does not make a material difference to the analysis.

1.74. Through our analysis, we do not find a material overestimation between the solar capacities, with only a small differential seen at distribution, but not transmission, compared to sensitivities. We also find in our analysis that there is a reduction in 'planning submitted' solar moving to Gate 1 in our sensitivity case compared to the base case, which is contrary to consultation views.

1.75. For battery storage, our sensitivity analysis does result in a higher capacity of battery projects in the Gate 2 queue than our assessment, due to a significantly higher number of consented battery projects, compared to the base case, which results in a at least 52GW of battery projects receiving a Gate 2 offer, 15GW more than the CP2030 Action Plan 2035 permitted capacity. We have considered the trade-off of increased protected capacity compared to managing investor confidence and see this as an acceptable outcome.

1.76. The sensitivity case does show more onshore wind in the status quo queue and more onshore wind in the Gate 2 queue than we anticipate in the base case. We do recognise that a non-zero capacity of onshore wind that has submitted planning could move to the Gate 1 queue in the sensitivity case, which we consider further.

1.77. 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. We have acknowledged the limitations of this data, namely that 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.

1.78. Therefore, as noted in the Impact Assessment (Chapter 3 paragraph 3.12), we have not been able to assess the precise impacts TMO4+ would have on specific projects / companies.

1.79. **Costs:** As set out through Chapter 2, we have provided a detailed assessment of costs associated with TMO4+ to networks, developers and consumers in this Impact Assessment.

1.80. 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.

1.81. Network companies have provided analysis showing that under reform the level of network build required will reduce. This will allow networks to focus their own investment where it is most needed, and - to the extent that the reform allows networks to also minimise enabling network build costs – it reduces the level of investment connecting projects must put into network. Whilst not quantified in the Impact Assessment, this is expected to result in savings of tens of billions of pounds, of unnecessary network costs associated with the current queue.

1.82. We acknowledge in the Impact Assessment (Chapter 3) that, as the readiness status of individual projects is not known with certainty at the time of assessing these impacts, we have had to assess against the likely aggregate impacts of TMO4+, meaning we do not know exactly which projects would meet the readiness criteria.

1.83. This means that we have not been able to assess the precise impacts TMO4+ would have on specific projects / companies. We acknowledge that reforms could result in financial loss and impact for projects that are moved to the Gate 1 queue, which we have considered but not assessed by reference to specific projects.

1.84. We also consider that TMO4+ will deliver wider benefits, which include lowering consumer bills through cheaper generation, a key cost consideration for us given our principal objective.

1.85. The financial costs of these reforms as a whole are proportionate and justified as compared to the overall benefits of the reform which are set out in 'Decision: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment'.

1.86. **Investment:** The CP2030 Action Plan provides investor clarity for those projects required for both the 2030 and 2035 pathways. Beyond 2035, we expect the first SSEP, expected in 2026, to provide the foundation for queue ordering and offer preparation in line with a longer-term view of need beyond 2035. This would give investor clarity to those projects needed beyond 2035.

1.87. As noted in the Impact Assessment (in Chapter 2), 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 consider 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, in order to realise the wider benefits of connection reform.

1.88. We consider that the potential impact reform could have on investor confidence in the short term are reasonably mitigated by NESO's protections provided reforms are implemented rapidly and transparently. While we recognise the concerns raised by stakeholders on investment in projects in Gate 1, and given the other uncertainties facing these projects, we do not consider they outweigh the increased investor confidence that would 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.

1.89. For more detail see Chapter 2, 'Impacts on Investor Confidence'

1.90. 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.

1.91. **Project Protections:** We agree that it is important to ensure that the most well-progressed projects with existing contracts that can support Clean Power by 2030 are given maximum certainty that they will be eligible for Gate 2 contracts. We also agree that there is an opportunity to simplify and extend Protection Clause 3 to make it fairer across different planning regimes. Accordingly, we have recommended that NESO:

- provide assurance to projects eligible for protection clause 2a and which have existing agreements to connect on or before 31 December 2027 that these projects will retain connection dates and connection points.
- simplify Protection Clause 3 so that projects/customers that (i) submitted planning on or before 20th December 2024 (ii) have no outcome by the closure of the CMP435 application window and (iii) achieve consent after the closure of the CMP435 window are eligible to receive Gate 2 terms in a future CMP434 window even if this would breach zonal or national permitted capacities.

1.92. Please see the Gate 2 Criteria Methodology decision, for a detailed assessment of how we have considered this point.

1.93. **CfD:** As noted in Chapter 2, 'Other Statutory Duties – Competition', of the Impact Assessment, we do not expect that CfD competition will be reduced in the near-term by the implementation of the TMO4+ package. We see the development of the SSEP and policy choices about its implementation as an opportunity to explore the longer-term impact on competition and the role of the SSEP, connections, and other policy levers in fostering the right balance between competition and strategic planning. While we do not agree that it is necessary for the Gate 2 Criteria Methodology or the CNDM to contain attrition assumptions for approval, we do expect NESO to consider, after receipt of Gate 2 evidence, if, based on new information, there is any reason to review and update the Methodologies. We will also have the ability to trigger a review of the Methodologies to enable intervention if there are significant risks emerging to competition.

1.94. **Scotland:** As acknowledged in Chapter 2 ('Background: Data used to apply readiness criteria to the existing queue and Breakdown of parties in the Gate 1 queue'), we recognise that there will be locational specific impacts with these reforms, including in Scotland. Indeed, our sensitivity check does note that there could be up to 4.2GW of onshore wind projects in Scotland that have submitted a planning application that may be moved to the Gate 1 queue, compared to our estimate in the draft impact assessment (0GW). The criteria to be applied under these reforms are GB wide and designed to deliver Clean Power 2030 in line with the plan set by the Government, which laid out a specific technology mix to provide a secure, operable and cost-effective system. The impact of the capacity limits in different parts of GB will necessarily be different depending upon the current level of generation (of the different technology types) in different areas. Please see our community energy response below for further context.

1.95. **Distribution:** TMO4+ applies equally to larger distribution generation and storage projects.

1.96. For connections reform to deliver the connections needed to deliver Clean Power 2030 and subsequently net zero, it must be fully implemented at distribution level. Consequently, we expect the DNOs to implement processes at distribution alongside, and in response, to NESO's TMO4+ proposals.

1.97. We have made changes to the distribution licence as part of this process (see 'Decision on TMO4+ Reform related Modifications to Electricity Licence Conditions', the separate decision document in response to our statutory consultation) to ensure that DNOs are required to follow the reformed connections process.

1.98. Please see 'Summary Decision Document: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & Impact Assessment', TMO4+ at distribution, for further detail.

1.99. **Demand:** As noted in Section 2, *Wider Impacts – Impact on demand projects*, of the Impact Assessment, we consider that these reforms put the GB energy system in a better baseline position and provide opportunities for all ready and needed projects to progress (including demand, as all projects are deemed needed). Projects that do not meet the ready and needed criteria will be moved to gate 1, making it likely that some demand projects that are ready receive improved dates. Crucially, demand projects moved to Gate 1 can progress to Gate 2 when the readiness criteria are met. We are also exploring with the Government and NESO whether any further future changes to the connections process is required to better facilitate demand.

1.100. **Hybrids:** It is appropriate to treat hybrid projects in line with their behaviour and impact on the network and thereby ensure that the treatment of technologies that comprise a hybrid project is consistent with the treatment of other technologies of the same technology type. Please see '*Decision: Gate 2 Criteria Methodology*' for a detailed response.

1.101. With regards to our original analysis of hybrid projects, as we note in the Impact Assessment (Section 2*, Impact on innovative technologies and hybrid technologies*), while there is a risk that solar and battery hybrid projects may be misclassified, our sensitivity analysis does not demonstrate that this is likely to be the case. Therefore, there is no obvious change to our Impact Assessment calculation methodology required.

1.102. It is possible that there is a misclassification of hybrid projects which include onshore wind in our assessment, which could be over-estimating the total capacity of solar in the queue and underestimating the total capacity of onshore wind in the queue. Our assessment finds a small capacity impact, and therefore we do not see this as having a material impact. It therefore does not change our conclusions on the impacts of the relevant technologies.

1.103. **Community Energy:** The CP2030 Action Plan says that while much of the generation capacity that will be deployed by 2030 is likely to come from large-scale, commercial energy, that "*local and community renewable energy will also play a vital role in delivering our ambitions, contributing to the capacity mix on aggregate basis, delivering significant local benefits…to the prosperity of local places, driving down electricity bills, encouraging people to engage with the green economy, providing energy resilience, and promoting skilled jobs*." We support government's ambition and agree that community-led solutions can help deliver benefits to current and future consumers while also delivering on broader social, economic, net zero and place-making goals.

1.104. However, we acknowledge some of the specific concerns raised by some stakeholders, with particular regard to onshore wind projects in Scotland (particularly those projects that are relying on repowering).

1.105. It was noted that that prior to the CP2030 Action Plan, development focus had been solely in Scotland due to the de facto onshore wind ban in England and Wales. This has now changed and, if approved, proposed changes to the Transmission Impact Assessment (TIA) threshold in England and Wales will significantly reduce waiting times and costs for smaller schemes (up to 5MW) connecting at distribution level. The Future Energy Scenarios that were the basis of the CP2030 Action Plan permitted capacities, were developed prior to the change in government, meaning this would have underestimated the level of/potential for onshore wind in England and Wales. As a consequence, the Government increased the onshore wind capacities in England and Wales to account for the lifting of the de facto ban. The capacities of Scottish onshore wind were also considered, but no uplift for 31-35 was deemed to be required because any increase in the permitted capacities would lead to a material increase in constraints between England and Scotland (across the B6 boundary).

1.106. While further changes are not yet being proposed for the TIA in Scotland, the thresholds for the Scottish mainland and island schemes remains under regular review. In addition, the ENA is also exploring options for bringing about consistency (among DNOs, between DNOs and the TOs) in how transmission related costs (securities and reinforcement) are passed down to distribution connection generators.

1.107. We are confident that TMO4+ will benefit a range of connection customers of differing scheme sizes or ownership arrangements.

1.108. **Pace of Delivery of TMO4+:** We consider that an appropriate balance was struck between robust policy development and the need for reforms to be enacted at pace.

1.109. Please see our detailed response to Q1 in 'Summary Decision Document: TMO4+ Connections Reform Proposals – Code Modifications, Methodologies & *Impact Assessment'*.

Appendix 2: Transmission Network Operators Impact Assessment

National Grid Electricity Transmission ("NGET")

Approach

2.0 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 CP2030 Action Plan.

2.1 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.

2.2 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.

2.3 The data below was captured from NGET internal records on 14/01/2025.

Impact on queue size and composition

2.4 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.

2.5 Therefore, 175 projects out of the 611 RFI respondents are assessed to remain in the Gate 2 Queue.

2.6 Across their network, NGET find that 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 permitted capacities in T8 region, and 700MW shortfall of solar to 2035 permitted capacities in T3 region. However, it is anticipated 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

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

2.8 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 only 27 of these enabling reinforcements were identified as no longer having any associated connections

2.9 NGET assess 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.

2.10 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 TMO4+ is assessed to result in a reduction of reinforcements needed of up to 20%.

2.11 NGET noted 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.

Effect on connection dates and substations

2.12 NGET find that up to 532 (out of 774) unique contracultural connection substation[63] sites would be impacted by TMO4+, with about two thirds of those substations projected to have no connections. These substations are a 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.

2.13 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).

[63] 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

2.14 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. This means that capacity is available for use by other projects, or alternatively, NGET can review 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.

2.15 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 ie 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

2.16 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.

2.17 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.

2.18 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

2.19 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 as assessed to result in 328 projects receiving a Gate 1 offer with a combined capacity of 54.8GW.

2.20 SPT's network area is heavily dominated by batteries, onshore Wind and hybrid generation and battery projects. Storage 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

2.21 SPT have assessed which TOCOs could 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.

2.22 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 technology with the potential to be swapped out and accelerated.

2.23 When applying the CP2030 Action Plan 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.

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

2.25 SPT provided four case studies demonstrating the impact that Readiness Criteria and Strategic Alignment criteria is 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

2.26 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.

2.27 When Readiness Criteria are applied to the existing queue, all but 3 of these Enabling TORIs are still enabling customer connections.

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

2.29 CP2030 alignment reduces the TOCO capacity associated with Enabling TORIs and reduces the number of TORIs which will be classified as enabling. However, SPT 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

2.30 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.

2.31 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' and receive a Gate 2 connection offer.

2.32 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

2.33 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.

2.34 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

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

2.36 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 therefore allows 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 will 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.

2.37 This case study demonstrates the complexity and interdependence network reinforcements 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 straightforward to determine whether others can accelerate, as the impact depends on multiple factors within the wider network, requiring detailed power systems analysis.

2.38 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.

2.39 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

2.40 SSEN-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. This means that the full capacity associated with them would not be affected because the projects they were enabling would not meet Gate 2 requirements.

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

2.42 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).

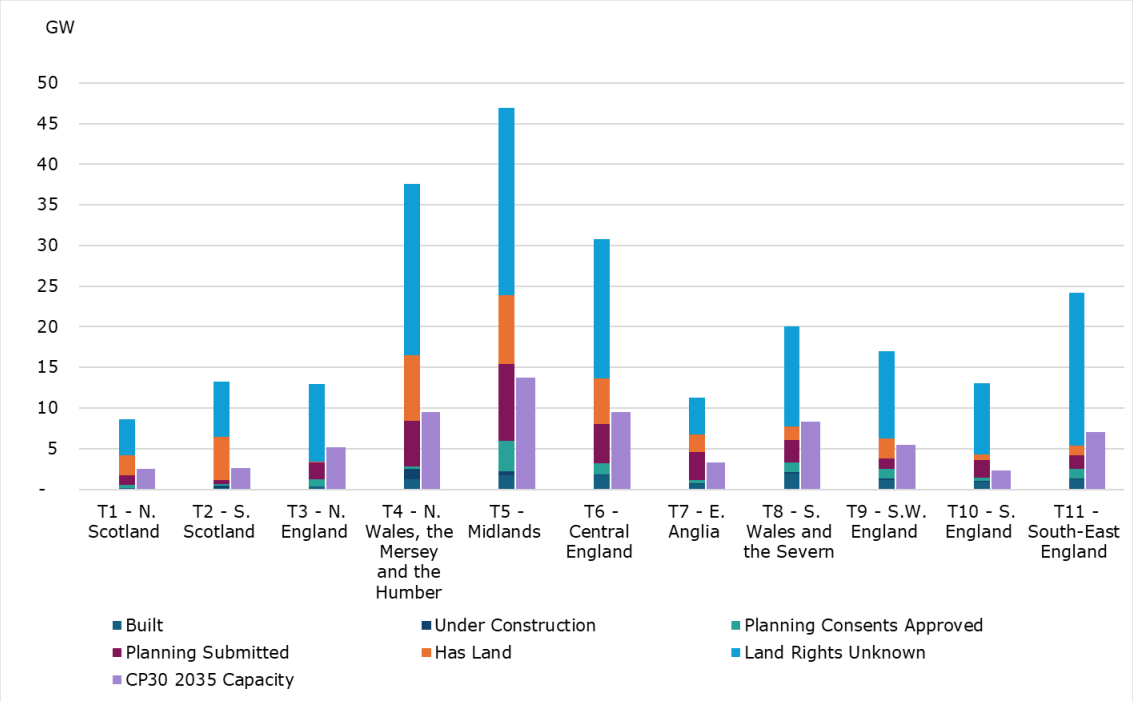
2.43 SSEN-T anticipates that TMO4+ will be highly influential where investment is required to accommodate customer connections. 'Connection only' TORIs have historically posed a significant challenge in demonstrating investment confidence and securing regulatory funding.

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

Appendix 3: Comparison of queue to CP2030 Action Plan Permitted Capacities

2.45 The figures below refer to the analysis we undertook to identify the estimated total capacity of solar, battery, and onshore wind projects at the regional level compared to the Clean Power 2030 permitted capacities (referenced through Chapter 2).[64]

Figure 19: Comparison of the combined queue of solar projects in each transmission zone to CP2030 Action Plan permitted capacities (GW)



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

Figure 20: Comparison of the queue of battery projects in each transmission zone to CP2030 Action Plan permitted capacities (GW)

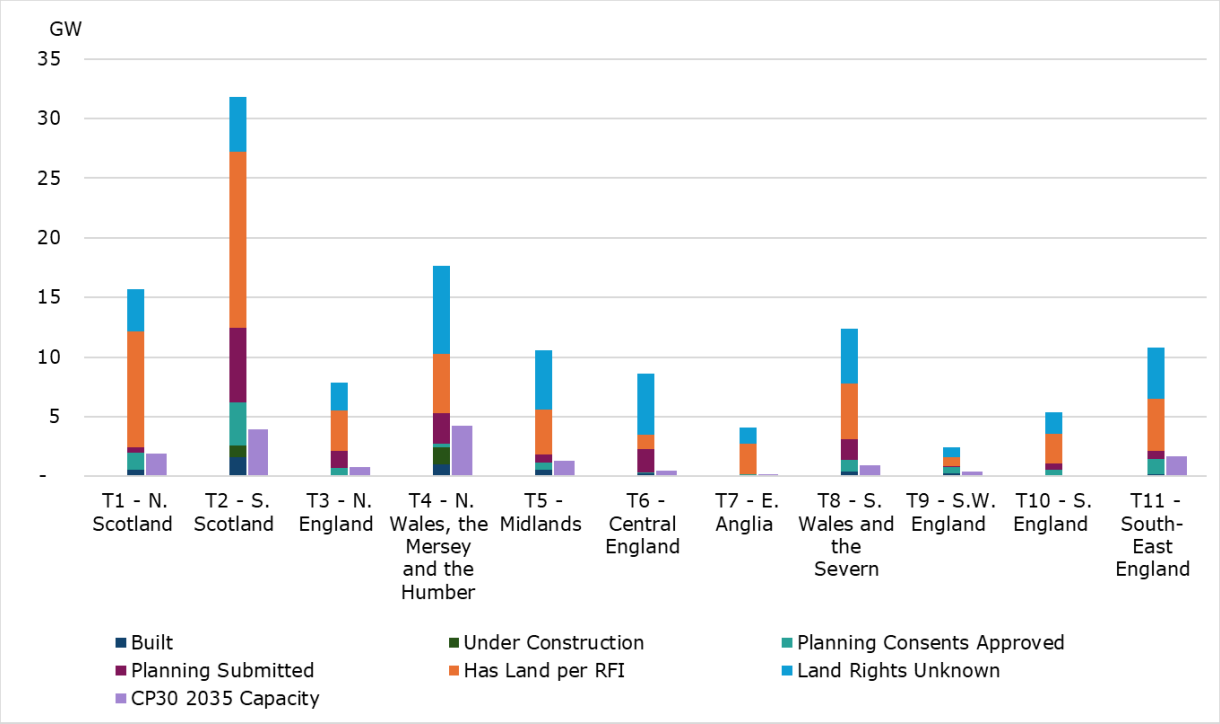


Figure 21: Comparison of the queue of solar projects in each distribution zone to CP2030 Action Plan permitted capacities (GW)

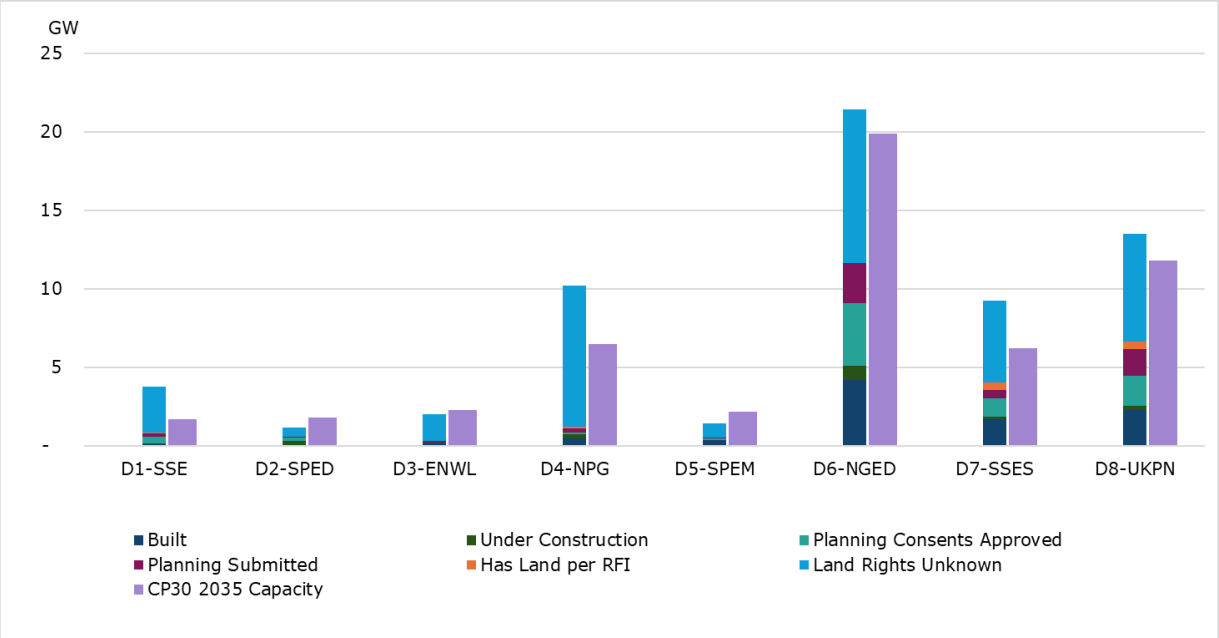


Figure 22: Comparison of the queue of battery projects in each distribution zone to CP2030 Action Plan permitted capacities (GW)

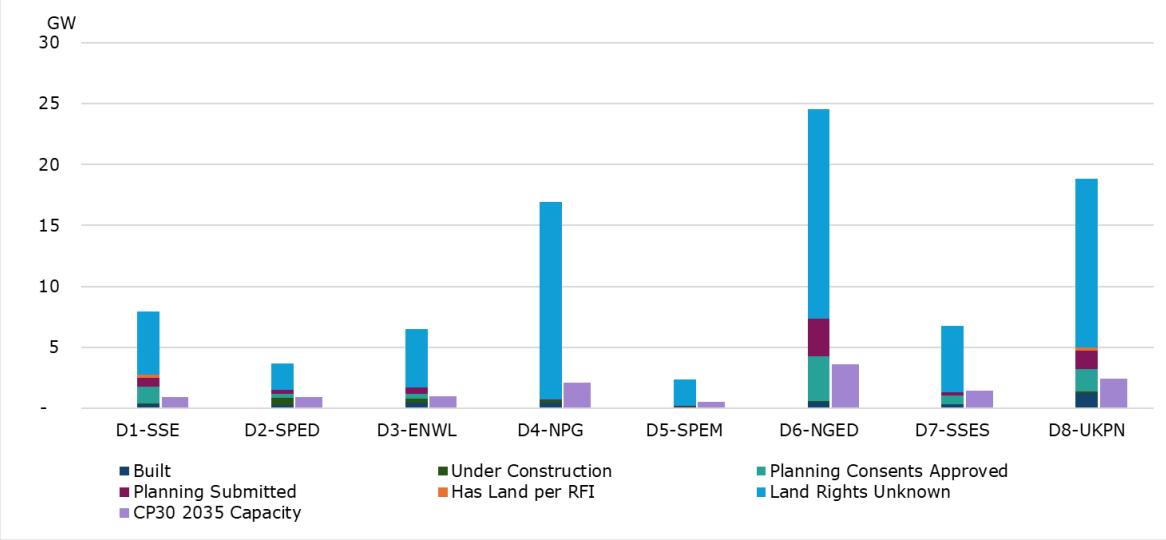
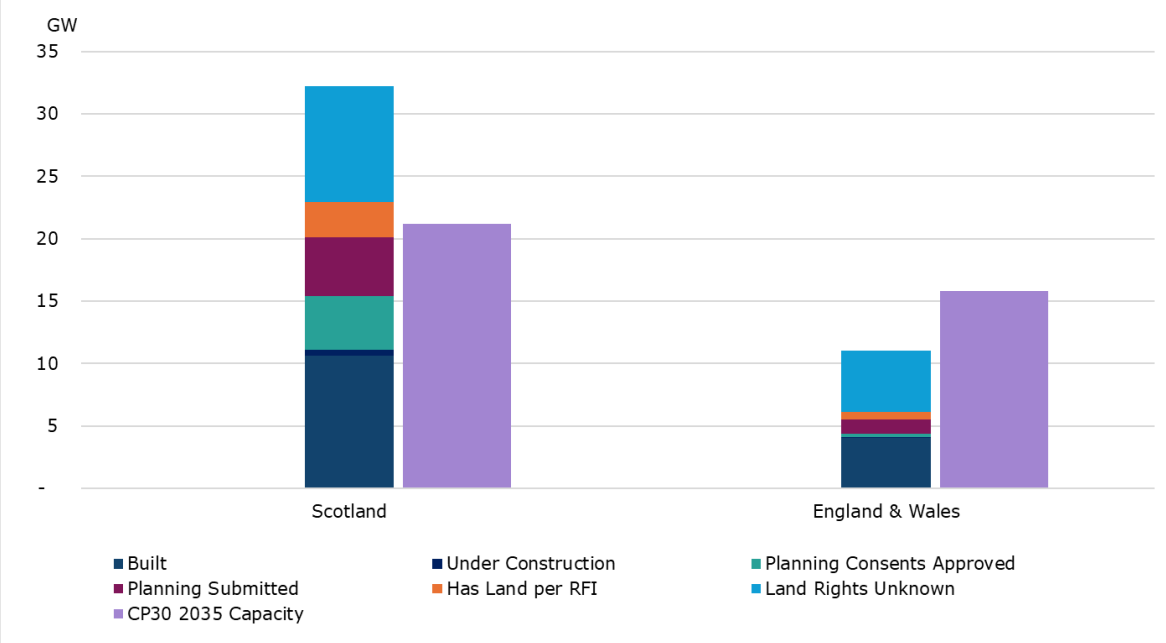


Figure 23: Comparison of the queue of onshore wind projects compared to the national permitted capacities "in CP2030 Action Plan permitted capacities (GW).



Appendix 4: Amalgamation of Solar Zones

4.0 In our original Impact Assessment, we noted that up to 21GW of solar projects with planning applications submitted may not meet Strategic Alignment Criterion B with a strict application of zonal permitted capacities, while the national permitted capacities are not met. (19GW following correction of Ratcliffe-on-Soar project classification). This estimate may be higher than reality due to the potential that our underlying dataset has overestimated the capacity of solar projects that have submitted a planning application, due to the passage of time since the data was collated for the initial Impact Assessment; this is not addressed in this appendix. We found in our initial Impact Assessment that there was a notable risk that well advanced transmission projects would be moved to the Gate 1 queue, while at the same time not having sufficient solar projects in the Gate 2 queue to meet the overall CP2030 Action Plan 2035 permitted capacities.

4.1 To assess the impacts of this change to the CP2030 Action Plan, we needed to know the capacity of solar in the distribution queue, aggregated by transmission zone. This information was collected from each of the DNOs and is shown in Table 30 below.

Table 30: 2035 permitted capacities of distribution solar by readiness status in each corresponding CP2030 Action Plan transmission zone

Tx Region	Built	Under Construction	Planning Approved	Planning Submitted	Has Land Right	No land/ Unconfirmed
T1	128	4	445	193	80	2,936
T2	66	264	175	60	-	602
T3	240	48	-	36	45	4,361
T4	1,130	397	292	385	90	7,549
T5	1,512	495	2,233	1,168	-	4,927
T6	1,405	117	1,348	989	235	4,113
T7	553	65	380	173	50	1,438
T8	1,626	207	1,176	886	182	3,969
T9	1,176	189	811	491	30	1,891
T10	807	30	391	137	240	2,130
T11	745	82	709	874	182	3,121
Total	**9,388**	**1,898**	**7,960**	**5,391**	**1,134**	**37,037**

4.2 Combining this data with the solar capacity at transmission results in a combined queue for each transmission region, shown below.

Table 31: Combined 2035 permitted capacities of solar projects in the distribution and transmission queue (over TIA threshold) by CP2030 Action Plan Transmission Zone

Tx Region	Built	Under Construction	Planning Consents Approved	Planning Submitted	Has Land	Land Rights Unknown	CP30 2035 Capacity
T1	128	4	445	1,123	2,520	4,361	2,500
T2	155	264	259	460	5,353	6,750	2,600
T3	319	48	857	2,118	45	9,525	5,200
T4	1,280	1,227	292	5,592	8,087	21,133	9,500
T5	1,676	495	3,763	9,479	8,482	23,047	13,700
T6	1,712	117	1,398	4,754	5,642	17,188	9,500
T7	660	122	380	3,418	2,180	4,531	3,300
T8	1,887	207	1,224	2,779	1,652	12,345	8,300
T9	1,176	189	1,149	1,291	2,439	10,766	5,500
T10	964	30	391	2,169	770	8,741	2,300
T11	1,202	82	1,256	1,637	1,192	18,770	7,000
Total	**11,157**	**2,785**	**11,414**	**34,819**	**38,362**	**137,156**	**69,400**

4.3 Table 32 below shows the capacity of solar projects we would expect to be offered Gate 2 terms, by applying the TMO4+ reforms using the updated solar capacity cap in our medium scenario (Protected projects, and projects with land rights up to regional capacity cap given Gate 2 offer).

Table 32: Capacity (MW) of solar projects expected to receive a Gate 2 offer following amalgamation of transmission and distribution CP2030 Action Plan 2035 permitted capacities

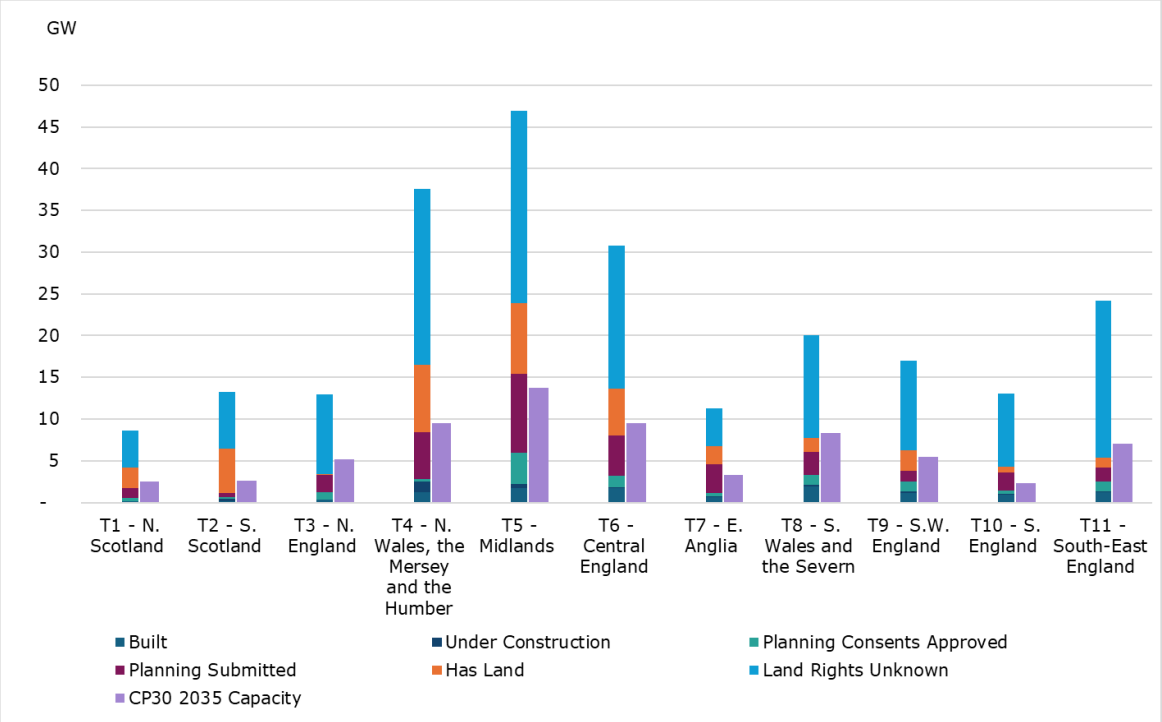
Tx Region	**Built**	**Under Construction**	**Planning Consents Approved**	**Planning Submitted**	**Has Land per RFI**	**Land Rights Unknown**	**Total**
T1	128	4	445	1,123	801	-	2,500
T2	155	264	259	460	1,462	-	2,600
T3	319	48	857	2,118	45	-	3,387
T4	1,280	1,227	292	5,592	1,109	-	9,500
T5	1,676	495	3,763	7,766	-	-	13,700
T6	1,712	117	1,398	4,754	1,519	-	9,500
T7	660	122	380	2,139	-	-	3,300
T8	1,887	207	1,224	2,779	1,652	-	7,748
T9	1,176	189	1,149	1,291	1,695	-	5,500
T10	964	30	391	915	-	-	2,300
T11	1,202	82	1,256	1,637	1,192	-	5,368
Total	11,157	2,785	11,414	30,572	9,475	-	65,403

Table 33: Capacity of solar projects expected to receive a Gate 1 offer following amalgamation of transmission and distribution CP2030 Action Plan 2035 permitted capacities

	Planning Submitted	**Has Land Rights per RFI**	**Land Rights Unknown**	**Total**
Solar	4,247	29,292	140,206	173,745

4.4 Figure 25 below shows the capacity of the combined distribution and transmission solar queue in each of the 11 transmission zones from the CP2030 Action Plan, compared to the new combined transmission and distribution capacity cap for that zone.

Figure 25 Comparison of the combined distribution and transmission queue of solar projects in each transmission zone to CP2030 Action Plan 2035 permitted capacities (GW)



4.5 The main impact of combining the transmission and distribution zone permitted capacities is that we have much more solar capacity expected to receive a Gate 2 offer, up from approximately 39GW in our original minded-to Medium Scenario which strictly applied transmission and distribution permitted capacities, to 65GW when applying the new combined capacity cap. This is just under the 69.4GW permitted capacity for 2035 in the CP2030 Action Plan.

4.6 We also expect that fewer solar projects that have submitted a planning application will be moved to Gate 1, down from 21GW to 4GW. This is a positive impact, and it reduces any negative consequences for a large pool of advanced solar projects which may have invested significant sums in preparing an application. However, there is a risk that without substitutions some projects that have submitted a planning application or are in the pre-application stage of an NSIP process could be moved to Gate 1.

4.7 Considering this update to solar permitted capacities in the context of the uncertainties in the underlying queue data as discussed in Chapter 2 and Chapter 3, we consider the following impacts to be possibilities:

- If planning status is significantly out of date, we would expect the number of solar projects receiving a Gate 2 offer to increase owing to more projects having consent and thereby being protected. If more projects have submitted a planning application than indicated by our data, there is a risk that more planning submitted projects are moved to the Gate 1 queue, however we think this is unlikely for a three reasons 1) the feedback we have received is that the NESO dataset may overestimate the capacity planning submitted projects 2) Regen's published data has less planning submitted projects than NESO and DNO data, and 3) Approximately 9GW of solar with just land rights are expected to receive a Gate 2 offer.
- If we have over or underestimated the amount of solar capacity in the queue due to how hybrid projects have been classified, we would expect the capacity in the Gate 1 queue to be lower or higher respectively. This would be dependent on the regional breakdown of the queue.

4.8 Figure 26 and Figure 27 below shows our assessment of the Gate 2 queue post implementation of TMO4+ using the original transmission and distribution solar permitted capacities, and the new combined permitted capacities, respectively.

Figure 26 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 permitted capacity prior to amalgamation of transmission and distribution permitted capacities.

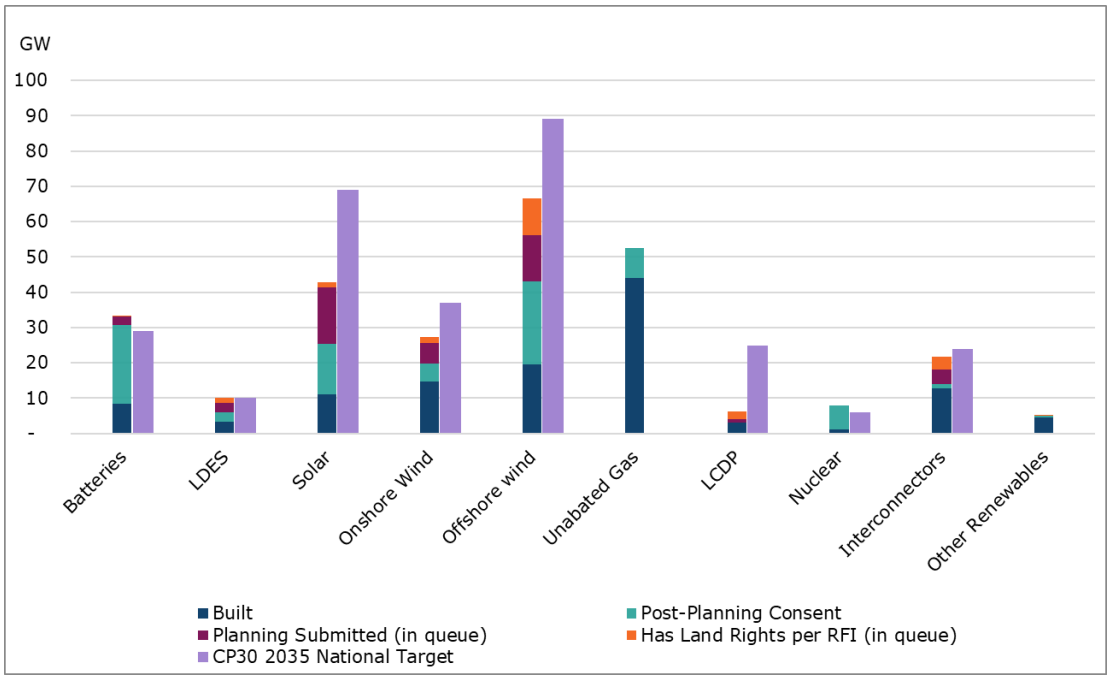


Figure 27 Capacity of different technology types with a Gate 2 offer in the queue, split by readiness level, compared to the maximum CP2030 Action Plan 2035 permitted capacity following amalgamation of transmission and distribution permitted capacities

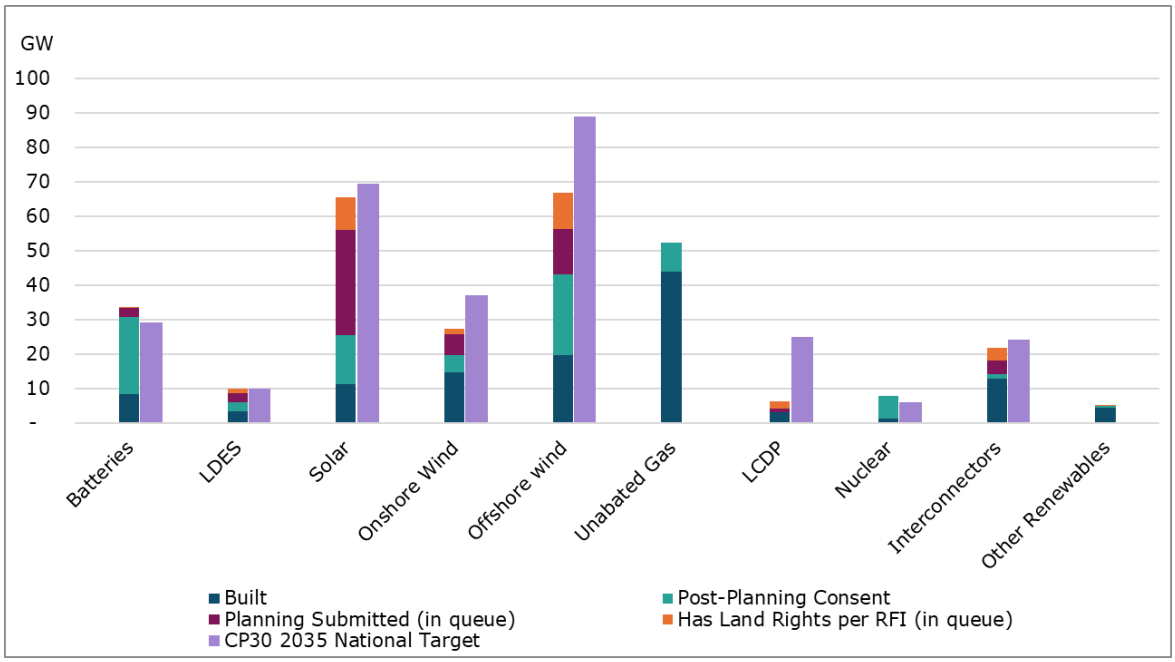
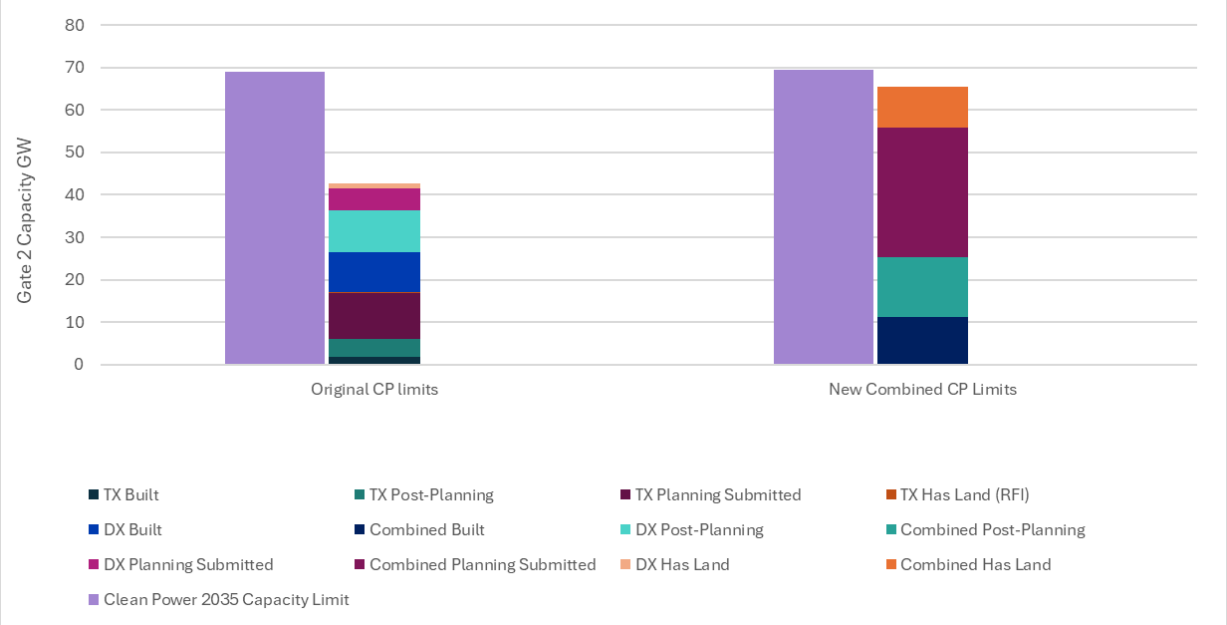


Figure 28 Comparison of the Gate 2 solar queue pre and post amalgamation of CP2030 Action Plan permitted capacities.



4.9 In our view this is an appropriate and targeted change that responds to the best available information and provides more clarity for solar developers with well-advanced projects. Moreover, it is crucial that the Connections Methodologies continue to adhere to the CP2030 Action Plan as the basis for Strategic Alignment. The CP2030 Action Plan is expected to be a stable guide for permitted capacities until the next energy system plan is published. In this case, overall, the impact benefits well-advanced solar projects.

4.10 No similar market shift or discrepancy in the data has been raised that makes the case for altering or amalgamating the transmission and distribution splits for either onshore wind or battery storage projects. Additionally, alteration to the transmission and distribution split would not have the same benefit of ensuring that the most well-advanced projects are prioritised as current planning data suggests that it is likely that most, if not all, of the regional permitted capacities out to 2035 for battery storage projects may be met through projects that are protected.

4.11 Overall, we are satisfied that the amalgamation of transmission and distribution zones for solar in 2031-2035 combined with the substitution mechanism already provided in CNDM balances effective implementation of CP2030 Action Plan permitted capacities with the dual priority of ensuring that, in general, more well-advanced projects receive Gate 2 offers.

4.12 Table 34 and Table 35 below shows the total capacity of projects of different technology types that we estimate will receive a Gate 2 and Gate 1 offer respectively, post implementation of TMO4+ following the update to the CP2030 Action Plan.

Table 34: Estimated capacity of projects that could reach Gate 2 under our three scenarios after the amalgamation of transmission and distribution permitted capacities for solar, compared with the national CP2030 Action Plan 2035 permitted capacities for each technology

Technology	**Low (GW)**	**Medium (GW)**	**High (GW)**	**2035 National permitted capacities (GW)**
Batteries	30.7	33.3	35.1	28.7
LDES	6.0	10.0	10.0	10.0
Solar	25.4	65.4	69.4	69.4
Onshore Wind	19.7	27.3	32.2	37.0
Offshore Wind	43.1	66.7	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	21.7	24.0	24.0
Other Renewables	4.9	5.0	6.8	0
Total	**207.3**	**296.0**	**351.9**	**289.1**

Table 35: 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 after the amalgamation of transmission and distribution permitted capacities for solar

Technology	**Planning Submitted**	**Projects with land that do not have planning (submitted or obtained)**	**Projects without land or planning**	**Total (GW)**
Batteries	20.4	55.5	110.7	186.6
LDES	0.0	0.2	1.6	1.8
Solar	4.2	29.3	140.2	173.7
Onshore Wind	0.0	2.2	14.4	16.7
Offshore Wind	0.0	0.0	50.1	50.1
Unabated Gas	5.0	4.8	2.4	12.1
Low carbon dispatchable power	0.0	0.0	21.6	21.6
Nuclear	0.0	0.0	0.9	0.9
Interconnectors	0.0	0.0	16.7	16.7
Other Renewables	0.0	0.0	1.8	1.8
Total Capacity	**29.6**	**92.0**	**360.5**	**482.1**

Appendix 5: Data Sensitivity Check

Our assessment using Regen queue data

Table 1 below compares the Regen queue data to the NESO and DNO data used in our analysis.[65]

Queue Capacity including already built (GW)	Regen	Ofgem	Difference (RAG shows relative amount of divergence)
Solar Tx	176.1	176.3	0.2
Solar Dx	64.4	62.8	- 1.6
Onshore wind Tx	28.8	28.1	- 0.7
Onshore wind Dx	16.9	15.9	- 1.0
Battery Tx	127.5	132.5	5.0
Battery Dx	94.3	87.5	- 6.8

5.1. The capacity of solar at Transmission is approximately equal between Regen and NESO datasets. There is a difference of 0.2GW in transmission solar capacity between the Regen and NESO datasets, however 3.5GW of solar capacity in the NESO dataset does not have an assigned transmission zone and so does not contribute towards the regional analysis against CP2030 Action Plan permitted capacities.

5.2. There is a difference of 0.7GW between the capacity of the onshore wind queue connecting at transmission in Regen's data and the NESO dataset, which we believe is primarily caused by 5 hybrid projects being classified as "Solar" in the NESO dataset when the largest generation capacity is associated with onshore wind. There is a further 0.7GW without an identified region in the NESO dataset (Scotland or England and Wales) which therefore

[65] The Ofgem numbers for queue capacity include projects that were unassigned regionally in the NESO data and therefore not included in queue analysis and therefore might not match up entirely with numbers presented in other sections of the document for the full queue size.

doesn't not contribute to the regional analysis against CP2030 Action Plan permitted capacities.

5.3. The transmission connected battery queues differ by 5GW, or by a bit less than 4% of the capacity of the Regen queue. One factor driving this is likely the 5.2 GW in unassigned regional battery capacity in the NESO data that are included in these figures.

5.4. We conclude from this comparison, that the NESO data and Regen broadly align regarding the size and technology makeup of the queue at transmission.

5.5. There is 1.6 GW difference between the capacity of solar projects in the distribution queue in Regen's data and the data used in our analysis from the DNOs. Potential sources of this difference could be Regen including solar capacity below the TIA threshold, and difference in accounting of hybrid projects. This difference is ~2% of the combined solar queue, and therefore we do not think this will significantly impact on our analysis of which projects receive a Gate 2 and Gate 1 offer, and consequently our understanding of the impacts of TMO4+.

5.6. There is a difference of 0.7 GW between the capacity of the onshore wind queue connecting at transmission in Regen's data and the NESO dataset, which we believe in part caused by 5 hybrid projects being classified as "Solar" in the NESO dataset when the largest generation capacity is associated with onshore wind. There is also 0.7GW without an identified region in the NESO dataset (Scotland or England and Wales) which therefore doesn't not contribute to the regional analysis against CP2030 Action Plan permitted capacities.

5.7. There is approximately 0.9 GW difference in the capacity of onshore wind in the queue between Regen and the data used in our analysis from the DNOs. This is a notable divergence, representing ~6% of the distribution onshore wind queue. Across all 8 DNO regions, significant differences are observed in D1 where Regen have 1.0 GW more in capacity built or in the queue, D2 where Regen have 0.8GW more built or in the queue, D3 where Regen have 0.5GW more, and UKPN where Regen have 1.1GW less onshore wind in the queue.

5.8. Onshore wind in Scotland in particular is an area of concern for developers raised to Ofgem during our consultation. The view amongst industry is that advanced onshore wind projects in Scotland will be moved to the Gate 1

queue. We discuss this issue further when comparing the impacts of TMO4+ on the Gate 2 and Gate 1 queues capacity using Regen's data to our analysis.

5.9. Regen data indicates there are 94.3GW of battery capacity in queue connecting at distribution, compared to 87.5GW in our dataset from the DNOs, this is a difference of 6.9GW. This difference is largely driven by a 4GW difference in battery capacity in D6 region.

5.10. Overall, across both transmission and distribution, even when the capacity in the queue is roughly equal in both datasets the readiness status of projects is different, with Regen having more capacity at later readiness stages in almost all categories. The exception is transmission solar, where the NESO dataset has more capacity that is identified as having submitted planning consent, and less capacity that only has land rights, when compared with Regen's data. It is possible that Regen may have more up to date information on the planning status of projects, compared with the NESO and DNO datasets, except for transmission solar, where we believe pre-planning projects may have been misclassified as having 'submitted planning' in the NESO data.

5.11. As with the analysis carried out in the previous sections, we have applied the TMO4+ readiness and strategic alignment criteria to the queue data to estimate the capacity of projects of different technology type receiving a Gate 2 and Gate 1 offer. Regen published their dataset grouping distribution capacity by distribution zone, therefore it has not been possible to use Regen's data to compare the solar queue against the updated CP2030 Action Plan permitted capacities, so for the purpose of comparison we have used the original transmission and distribution permitted capacities.

5.12. Table 2 below shows the capacity of different technologies, split by readiness level, which we would expect to receive a Gate 2 offer, if the Regen data was an accurate reflection of the Gate 2 queue. As with the analysis using NESO and DNO data, we have assessed the total capacity in the Gate 2 queue in two scenarios, a low scenario where only protected projects receive a Gate 2 offer, and a high scenario where all projects in the current queue are

assumed to have land rights and are given a Gate 2 offer, until the CP2030 Action Plan permitted capacities are reached.[66]

5.13. We have flagged in green whether the CP2030 Action Plan 2035 permitted capacity has been met or exceeded in each of the scenarios.

Table 2 – Capacity (GW) of projects estimates to be in Gate 2 using Regen data.

	Built	Post-Planning Consent	Planning Submitted	Rest of Queue	Low Queue Estimate	High Queue Estimate	CP 2035 permitted capacities
Batteries	7.7	44.5	0.9	0.3	52.2	53.5	28.7
Solar	16.0	19.5	9.2	24.7	35.5	69.5	69.4
Onshore Wind	16.3	6.4	4.4	3.2	22.8	30.4	37.0

Table 3 - Gate 2 capacity (GW) resulting from analysis using NESO and DNO data.

	Built	Post-Planning Consent	Planning Submitted	Has Land Rights	Land Rights Unknown	Low Queue Estimate	Medium Queue Estimate	High Queue Estimate	CP 2035 permitted capacities
Batteries	8.4	22.3	2.5	0.1	1.8	30.7	33.3	35.1	28.7
Solar	11.2	14.2	30.6	9.5	4.0	25.4	65.4	69.4	69.4
Onshore Wind	14.7	5.1	5.9	1.6	4.9	19.7	27.3	32.2	37.0

5.14. Analysis using either dataset results in the CP2030 Action plan permitted capacities being met and exceeded for battery projects. Regen's data results in a much higher capacity of Battery projects in the Gate 2 queue than our assessment. This is due to Regen data containing approximately 22GW more consented battery projects than the NESO and DNO data, which results in a at least 52GW of battery projects receiving a Gate 2 offer, 15GW more than the CP2030 Action Plan 2035 permitted capacity.

[66] Due to a lack of information on land rights in the Regen data, we have not been able to produce a corresponding 'Medium Scenario' which contains protected projects, and projects with land rights up to the CP2030 Action Plan permitted capacities.

5.15. Regen's data has more solar capacity that is classed as 'built' or has planning consent than the NESO and DNO data, which results in higher capacity of protected projects in the Gate 2 queue. The key takeaway for solar is similar for analysis conducted using either dataset, which is that the 2035 solar permitted capacities likely won't be met by protected projects but are likely to be met with ready projects receiving a Gate 2 offer.

5.16. For onshore wind, the capacity receiving a Gate 2 offer differs by approximately 8GW in the Regen Dataset in the different scenarios, with Regen's data containing more built and protected onshore wind than in the NESO and DNO datasets. The overall takeaway here is similar for analysis conducted using either dataset, with the England and Wales being undersupplied when compared with the 2035 permitted capacity, and Scotland being over supplied with some well-progressed projects with planning submitted expected to receive a Gate 1 offer.

5.17. Table 4 and 5 below shows the capacity of battery, solar, and onshore wind projects, estimated to receive a Gate 1 offer, using the Regen and NESO /DNO datasets respectively.

Table 4 – Gate 1 using Regen data in the High scenario (Protected projects and assumes all projects in the queue have land rights)

	Built	Post Planning	Planning submitted	Remaining queue	Total
Batteries	-	-	31.0	137.4	168.3
Solar	-	-	1.4	169.7	171.1
Onshore Wind	-	-	4.2	11.1	15.3

Table 5 Gate 1 using NESO and DNO data in High scenario (Protected projects and assumes all projects in the queue have land rights)

	Built	Post-Planning	Planning Submitted	Has Land Rights	Land Rights Unknown
Batteries	-	-	20.4	55.5	108.9
Solar	-	-	4.2	29.3	136.2

Onshore Wind	-	-	-	2.2	9.5

5.18. Battery storage: Using Regen's data, we estimate that less 'ready' battery storage capacity will be moved to the Gate 1 queue than in the NESO dataset. Although Regen data contains more Battery capacity overall in the queue, it also contains a higher capacity of protected projects, and a higher capacity of projects that have submitted planning applications. Although, we estimate that less capacity will be moved to the Gate 1 queue using Regen data, there is a 11GW increase in the capacity of 'planning submitted' projects moved to the Gate 1 queue than compared to analysis using NESO and DNO data.

5.19. Solar: Regen's data contains slightly more capacity overall moving to the Gate 2 queue. In Regen's data more total capacity is moved to the Gate 1 queue, albeit a smaller capacity in Regen's data has submitted planning (1.4GW), compared to NESO's dataset used in our assessment (4.2 GW).

5.20. Onshore wind: Finally, another significant difference between the result of analysis using Regen and NESO / DNO data, is the readiness of onshore wind projects moved to the Gate 1 queue. Using Regen's data we estimate that 4.2GW of onshore wind that has submitted a planning application will be moved to the Gate 1 queue – all of this being in Scotland. If Regen's data is a more accurate picture of the current readiness of the queue, this means that TMO4+ will have a negative impact on a larger group of more ready onshore wind projects than initially thought in our original Impact Assessment.

5.21. However, the 4.2GW of onshore wind (located in Scotland) that has submitted planning permission and will be moved to the Gate 1 queue, has a good chance of moving to the Gate 2 queue in future if and when their planning application is approved, as they will be protected under Protection Clause 3[67] if they submitted the planning application prior to 20 Dec 2024, and we believe it is unlikely that the GB 2035 onshore wind permitted capacities will be met in the near term.

[67] Page 40, Section 6.2, Gate 2 Criteria Methodology

Treatment of Hybrid projects

Transmission data

5.22. A project can have a single connection point to the electricity network but have multiple generation and storage technologies using that connection e.g. a solar and battery project, with a single connection to the electricity system.

5.23. The NESO dataset is based on TEC register data. In the TEC register each data entry corresponds to a grid connection or 'project' and can be made up of multiple generation and storage technologies on the TEC register.

5.24. The NESO dataset does not contain a capacity for each technology comprising a hybrid site, instead it shows the transmission entry capacity which could be shared by multiple technologies.

5.25. In the NESO dataset, and for the purpose of our analysis comparing queue capacity to the CP2030 Action Plan permitted capacities, hybrid projects have been classified to a single technology e.g. hybrid solar and battery projects being classified as solar.

5.26. There are 570 transmission connected hybrid projects in the NESO dataset out of 1595 total projects. 453 of these are hybrid solar and energy storage projects, with a total capacity of 175GW. 451 of these projects, equal to 171GW have been classified as solar for the purpose of our analysis. 69 projects are hybrid projects containing onshore wind equal to 23GW of capacity, of which 38 projects equal to 5.4GW has been classified as onshore wind for the purpose of our analysis, 23 projects equal to 9.7GW has been classified as Solar, and 8 projects equal to 8.0GW has been classified as Battery.

DNO data

5.27. DNOs have included hybrid projects in the capacities for the relevant technologies where known.

5.28. SSE provided capacity for hybrid solar and battery projects. We have included this capacity in the total capacity for solar when using the data to assess the impacts of TMO4+. This is consistent with the assumptions used for transmission data.

Impacts

5.29. The potential issue with the approach taken in the NESO dataset is that it may incorrectly assign all the grid capacity for a project to a single technology type, whereas some or all of that capacity may need to be assigned to different technology type for the purposes of TMO4+ queue formation. This was a logical, if high-level assumption to take; most hybrid sites have an on-site battery for optimisation purposes.

5.30. To take an extreme example. if all the (transmission entry capacity) TEC of hybrid solar and battery projects that were assigned to the solar technology type were instead assigned to the battery technology type, we could expect the total capacity of transmission batteries in the queue to increase by 167GW to 299W (more than double), and the total capacity of solar to decrease by an equal amount.

5.31. Alternatively, if the TEC for a hybrid solar and battery project with an assigned solar technology type corresponded to equal installed capacities for both technologies e.g. a 100MW grid connection with 100MW of installed solar capacity *and* 100MW of installed battery capacity, we would expect the capacity of batteries in the queue to increase by 167GW with no loss in capacity of solar in the queue, meaning the total size of the queue would increase by 167GW (~21%), meaning the total generation capacity in the connection queue could be over 900GW.

5.32. If hybrid projects have been misclassified, this could result in a larger queue than first anticipated, in more capacity receiving a Gate 2 or Gate 1 offer than estimated in our original analysis.

5.33. Regen data is based upon data from planning registers and have separated out the capacity of solar and battery components of a hybrid project where this is clear in planning data. Therefore, if misclassification of hybrid projects was present in a significant way in the data, we would expect to see a noticeable divergence in estimated capacity of solar and battery in the transmission queues between the Regen data and the NESO data.

5.34. When comparing the total capacity of solar and battery projects in the transmission queue in the NESO dataset to Regen data, do not see this divergence. We see that the total capacities are approximately equal (176.1GW vs 176.3GW, and 127.5GW vs 132.5GW for Solar and Battery respectively), which indicates that the risk of misclassification of transmission

solar and battery hybrid projects has not manifested as a significant impact on the total estimated capacity in the queue.

5.35. We do believe misclassification of hybrid projects which include onshore wind, could be impacting on the total capacity of onshore wind in our analysis of the transmission queue. We have identified 5 projects equal to 1.1GW of TEC, that have been classified as solar but data available online indicates that onshore wind potentially represents the largest source of export capacity.

5.36. The result of the above potential misclassification of hybrid projects containing onshore wind as solar, is that we may be over inflating the capacity of solar in the queue and underestimating the capacity of onshore wind in the queue (by 1.1 GW for each). For onshore wind in Scotland in particular, we received feedback stating that we had underestimated onshore wind in Scotland and as a result has underestimated the capacity of onshore wind which would receive a Gate 2 offer. We recognise this difference, but see this as a small deviation and does not significantly alter our conclusions on impacts for either of these technologies.

5.37. Additionally, as pointed out by some respondents to our consultation, hybrid projects could have different planning statuses for different technologies within a project, and there is a risk that the readiness status assigned to a project may not align to the technology type assigned to the same project.

5.38. For example, a hybrid project could have planned consent for the battery portion of the project, but not the solar portion, but this project could be assigned a readiness status of 'Consented' and assign the capacity to 'Solar'. If there was widespread misclassification of planning status for hybrid project, it would mean our analysis would inaccurately estimate the capacity of projects in the Gate 2 and Gate 1 queue for both solar and battery energy projects.

5.39. As discussed above in the section on planning status we do see some discrepancies with the planning status for solar, batteries and onshore wind when compared with Regen. We have not been able to determine whether these planning issues are resulting from out-of-date planning date, planning data being assigned to the wrong technology, or a combination of both.

5.40. Full clarity on the impact of TMO4+ on hybrid projects will not possible until NESO begins to collate data from parties, where the hybrid projects will be assured of being categorised correctly by providing evidence. We have taken

comfort that the total solar & battery capacities between the two different data sources are similar, meaning we have not seen any evidence that shows significant misclassification. As a consequence, there is a risk that there in an increased capacity of well-progressed battery storage (planning submitted) moving to the Gate 1 queue, due to the classification of hybrid projects as solar. However, the assessment of the sensitivity is not conclusive of a significant misclassification and there is no obvious change to our Impact Assessment calculation methodology required, and we have considered the potential underestimate of planning submitted battery storage receiving Gate 1 offers within our assessment. We recognise there is a small capacity differential between onshore wind and solar due to hybrid projects, but also do not see this as having a material impact and similarly does not change our conclusions on the impacts of the relevant technologies.

Summary

5.41. We have utilised queue data provided by NESO and DNOs, to assess the impacts of TMO4+ on the queue.

5.42. The transmission project data provided by NESO utilised a combination of RFI data collected between May and October 2024, and assessment of planning status carried out by Regen in August 2024 to inform the readiness status of transmission projects.

5.43. DNOs utilised their own internal data, including data on queue management milestones, to inform readiness status of projects.

5.44. We expect that the readiness status in the NESO and DNO data will have progressed, and therefore we would expect the queue to be more advanced than presented in our analysis.

5.45. Capacity of hybrid projects in the data has been allocated to one technology for the purpose of assessing TMO4+ criteria, and therefore our analysis may over or underestimate the capacity of certain technologies, it may also mean that the planning status for one technology type within a hybrid project may be being applied to the wrong technology type.

5.46. Finally, when comparing our data with data provided by third party sources during consultation, it appears that our data underestimates the capacity of onshore wind in the distribution queue.

Appendix 6: Removed Projects Data

These tables refer to the specific analysis we undertook to identify the estimated total number of solar and battery transmission specific projects (rather than overall capacities) which our analysis indicates would be moved to the Gate 1 queue (Chapter 2).

T1 - N. Scotland	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	54	62	87%
Solar	6	13	46%
Total	60	75	80%

T2 - S. Scotland	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	97	126	77%
Solar	18	38	47%
Total	115	164	70%

T3 - N. England	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	17	29	59%
Solar	14	24	58%

Total	31	53	58%

T4 - N. Wales + Mersey	**Number of Removed Projects by Region and Technology**	**Total Projects**	**Removed Projects as % of Total Projects**
Battery	32	61	52%
Solar	39	71	55%
Total	71	132	54%

T5 - Midlands	**Number of Removed Projects by Region and Technology**	**Total Projects**	**Removed Projects as % of Total Projects**
Battery	22	36	61%
Solar	64	96	67%
Total	86	132	65%

T6 - Central England	**Number of Removed Projects by Region and Technology**	**Total Projects**	**Removed Projects as % of Total Projects**
Battery	15	28	54%
Solar	29	56	52%
Total	44	84	52%

T7 - E. Anglia	**Number of Removed Projects by Region and Technology**	**Total Projects**	**Removed Projects as % of Total Projects**
Battery	5	14	36%
Solar	14	22	64%
Total	19	36	53%

T8 - S. Wales	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	43	60	72%
Solar	22	41	54%
Total	65	101	64%

T9 - S.W. England	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	12	21	57%
Solar	18	30	60%
Total	30	51	59%

T10 - S. England	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	23	29	79%
Solar	18	25	72%
Total	41	54	76%

T11 - S.E. England	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	29	44	66%
Solar	35	50	70%
Total	64	94	68%

GB Wide	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Battery	349	522	67%
Solar	277	474	58%
Total	626	996	63%

By Technology and Planning Status	Number of Removed Projects by Region and Technology	Total Projects	Removed Projects as % of Total Projects
Batteries - Planning Submitted	38	67	57%
Batteries - Has Land Rights (RFI)	159	168	95%
Batteries - Land rights unknown	152	158	96%
Solar - Planning Submitted	0	72	0%
Solar - Has Land Rights (RFI)	26	94	28%
Solar - Land rights unknown	251	257	98%
Total	626	816	77%