Impact assessment

Annex I: CMP448 Impact Assessment

Team:	Connections team
Associated documents:	Connection and Use of System Code (CUSC) CMP448: Introducing a Progression Commitment Fee to the Gate 2 Connections Queue and Annex II: additional assessment of CMP448 code modification
Coverage:	Full coverage of reasons for decision in the associated documents.
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Policy objectives of the proposal

The CMP448 proposal aims to introduce a progression commitment fee (PCF) between the period of accepting a Gate 2 connection offer and achieving queue management milestone 1 (M1: submitting planning permission), as this is the longest period unviable projects could remain in the queue without the requirement to provide a financial commitment. The removal of unviable projects in the queue at the earliest opportunity will ensure a more reliable connections pipeline that improves the efficiency and economy of network planning and support the achievement of Clean Power 2030 Action Plan (CP2030) targets. The proposed fee is designed to incentivise regular assessment of project viability if the connections queue is in poor health and CP2030 may be at risk.

Policy options considered

The options considered include the original solution as intended by the proposer (known as the Original Proposal) and the two Workgroup Alternative CUSC Modifications (hereafter "WACMs") to this proposal. The latter are: a) WACM 1 that reduces the value of the fee by 90% (compared to NESO's original proposal) and sets the fee value at £0/MW for the first six months and; b) WACM 2 that retains the value of the fee of the Original Proposal but discounts the amount owned to NESO by 75% if the project has initiated project termination or capacity reduction prior to achieving M1. Ofgem's preferred option is the Original Proposal as it provides an incentive to regularly assess project viability and commit to the network capacity originally contracted, which is absent in the status quo. The Original Proposal also provides a stronger incentive compared to the WACMs accompanying the CMP448 proposal.

Long-Term Benefits of CMP448

The introduction of a Progression Commitment Fee (PCF) under CMP448 is expected to deliver several long-term benefits, some of which are difficult to quantify but strategically significant, these are:

- Improved Investor Confidence: by incentivising regular viability assessments, the PCF enhances the predictability and reliability of the connections queue, supporting investor certainty.
- Enhanced Strategic Network Planning: a connections queue composed of more committed projects provides clearer signals for network build, improving planning efficiency and reducing the risk of allocating resources inefficiently.
- Acceleration of Low-Carbon Deployment: faster progression of viable projects through the connections queue supports earlier connection dates, enabling quicker deployment of clean energy assets aligned with CP2030 targets.

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- Reduced Consumer Costs: efficient use of network capacity and reduced delays in connections can lower overall system costs, which ultimately benefit consumers through lower network charges.

Impact on Projects in the Connections Queue

The PCF affects different project types in distinct ways:

- Solar and Battery Projects: these face relatively higher proportional impacts due to lower DEVEX values, but the PCF remains within manageable bounds for most developers.
- Onshore Wind: moderate impact, with PCF costs ranging from 0.71% to 9.9% of DEVEX depending on scenario.
- Offshore Wind: least impacted due to higher DEVEX and longer development timelines; PCF costs are below 3.1% of DEVEX.
- Smaller Developers: may face challenges due to limited access to finance and higher relative costs, though the PCF is designed to test viability rather than discriminate by size.

View of Benefits and Costs

The PCF introduces a financial commitment during a critical stage of project development (between Gate 2 offer and Milestone 1). While this creates additional cost and administrative burden, the benefits of the PCF justify the intervention:

Benefits:

- More efficient queue management and reduced delays.
- Stronger incentives for developers to assess viability early.
- Better network build signals and reduced speculative planning.
- Potential consumer savings through improved network utilisation.

Costs:

- PCF financing costs range from 0.71% to 15.5% of DEVEX depending on project type and scenario.
- Administrative effort for developers and NESO to manage PCF administration.
- Despite these costs, the governance mechanism (including Ofgem’s veto power over PCF activation) ensures the PCF is only applied when necessary to protect CP2030 delivery and consumer interests.

Risks and Uncertainties

Several risks and uncertainties are acknowledged:

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- Barriers for Smaller Developers: Limited access to capital may make PCF financing more challenging, potentially impacting competition and diversity in the queue.
- Administrative Burden: developers may face increased effort in managing PCF-related securities and viability assessments.
- Overestimation of PCF Value or queue in scope: could lead to unintended exits of otherwise viable projects or reduced effectiveness of the policy.
- Underestimation of attrition rates: may result in a smaller, less diverse connections pipeline.
- Consumer Impact Uncertainty: while benefits are expected, exact monetary gains for consumers are difficult to quantify due to data limitations.

Despite these uncertainties, the proposal is aligned with Ofgem's strategic objectives and is expected to deliver net benefits to consumers and the energy system.
The Original Proposal of CMP448 delivers net benefits over the status quo by addressing a gap in the current framework, where cancellation charges can apply at a much later stage in the development stage of a project. In doing so, the Original Proposal ensures a more reliable and efficient connections pipeline, ultimately benefiting consumers through reduced system costs and improved network utilisation. Compared to the other alternative options (WACM1 and WACM2), the Original Proposal provides a stronger behavioural incentive. WACM1 significantly reduces the PCF value and introduces a six-month grace period, weakening its ability to influence timely project exits. WACM2 retains the PCF value but discounts liability upon early termination, which may encourage delayed exits close to the M1 milestone. The Original Proposal strikes a better balance between incentivising viability assessments and maintaining financial proportionality, resulting in a 'healthier queue', improved network build signals, and enhanced consumer outcomes through more efficient use of network capacity and accelerated deployment of clean energy assets aligned with CP2030 targets.

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1. Introduction

Section summary

Under the new reformed connections process (known as TMO4+), projects in the queue are not required to assess regularly their viability. This means that projects receiving a Gate 2 offer can become less viable in the future and the persistence of those projects in the queue can still cause delays and provide an unclear network build signal. The CMP448 proposal builds on the benefits introduced by TMO4+, aiming to introduce a dormant project commitment fee after projects have signed a Gate 2 agreement, which will be activated if the connection queue is deemed in 'poor health'[1] and risk to undermine CP2030. The proposal complements the TMO4+ Decision and has the potential to improve the efficiency of the connections process, whilst also increasing certainty for network build and investor confidence.

Problem under consideration

1.1 Connections Reform (known as TMO4+) does not require projects in the connections queue to regularly reassess their viability. This is because the criteria that need to be satisfied to receive a connection offer are based on project readiness and alignment with Clean Power 2030 Action Plan (CP2030)[2] permitted technology capacities, which are assessed at the point of initial Gate 2 connection application. Therefore, there could be instances where some projects meet those criteria initially and receive an offer, then subsequently their project becomes less viable, for example due to changes in market conditions, costs assumptions and risk appetite, or financing issues. The presence of unviable projects (even if marginally unviable) in the connections queue longer than needed can still cause inefficiencies in the connections process as well as in the transmission and distribution systems, providing an unclear network build signal. A connection queue made of more committed projects would provide much more certainty on the network capacity that needs to be built to connect projects and deliver CP2030. In turn, this will result in better outcomes for consumers because a proportion of network and generation costs are ultimately borne by consumers through network charges and bills. For more information about TMO4+ and a description of CMP448 see our Minded-to Consultation document.[3]

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[1] Queue health is a concept used by NESO as part of CMP448 to indicate the prevalence of less viable or stalled projects in the connections queue. A queue in 'poor health' would contain a high amount of less viable or stalled projects and a queue in 'good health' would contain a low amount of less viable or stalled projects

[2] Clean Power 2030 Action Plan (CP2030) is a document setting out a pathway to a clean power system by 2030. NESO has provided independent advice to HM Government, developing a range of pathways, including an analysis of the location and type of new investment and infrastructure needed to deliver it

[3] See Ofgem Minded-to Consultation: Connection and Use of System Code (CUSC) CMP448: Introducing a Progression Commitment Fee to the Gate 2 Connections Queue, pages 8-13

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1.2 The CUSC modification Proposal CMP448 incentivises regular assessment of project viability by introducing a progression commitment fee (PCF) as part of the cancellation charges and securities regime established in section 15 of CUSC. Given the connections reform is still under implementation, it is uncertain to ascertain the amount of projects that will not progress in the future Gate 2 queue. However, it is conceivable that a number of unviable projects will persist and to minimise the inefficiency this problem can cause the proposal complements the TMO4+ reform package.

Scope of Impact Assessment

1.3 This Impact Assessment assesses the CMP448 proposal, including the Original Proposal as intended by the Proposer (NESO), and the two Workgroup Alternative CUSC Modifications (WACMs). In this document these alternative solutions will be referred to respectively as WACM1 and WACM2.[4]

1.4 Ofgem is under a statutory duty to conduct an Impact Assessment when an important change is proposed.[5] 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, complies with these obligations by assessing the benefits, risks, and costs of implementing CMP448, as well as comparing this with the status quo.[6] One of the key drivers of this Impact Assessment is also to present the additional analysis provided by NESO which has been prepared after the Workgroup stage of CMP448.

1.5 This Impact Assessment considers the likely impacts of the proposal and, to the extent possible, the impacts are quantified. Using the data referred to in the paragraphs below, we have assessed the rationale for the design of the proposal and the PCF value, including the WACMs. We have also assessed the impact on four technology archetypes and estimated the queue in scope of the PCF, including scenarios for when the PCF could be activated, based on national and regional views. Finally, we have also assessed the impact on consumers, considering a mix of quantitative and qualitative views.

Key data sources used

1.6 To support our Impact Assessment, we asked NESO to provide the impact analysis that led to the development of the proposal and was discussed during Workgroups. NESO has also provided additional analysis considering the impact on project

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[4] For a detailed explanation of WACM 1 and WACM 2 see our Minded-to Consultation: Connection and Use of System Code (CUSC) CMP448: Introducing a Progression Commitment Fee to the Gate 2 Connections Queue, pages 12-13 and in our Final Decision, page 4

[5] As set out in Utilities Act 2000, section 5A

[6] See Impact Assessment Guidance | Ofgem

archetypes on national and regional level and the qualitative impacts on consumers which NESO conducted after the statutory Code Admin Consultation (CAC) required by CUSC. To complement our understanding of impacts, we have also requested that the impact analysis NESO prepared included both WACMs as appropriate. Therefore, one of the drivers for this Impact Assessment is to allow the scrutiny of the analysis that has not been discussed during the Workgroup stage of CMP448. The main data sources used in the NESO analysis are:

1. The Call for Input (CFI)[7] that shaped the CMP448 proposal – which provided information including but not limited to: a) project type and size, b) cost of capital, developer expenditure and how is funded, c) project expectations on how to raise finance to cover the PCF.
2. Connections queue data – an internal NESO dataset containing connections queue data.
3. Request for Information (RFI) data - The RFI responses received by NESO as of December 2024.
4. Clean Power 2030 capacities – Official data published in the Clean Power 2030 Action Plan, as of December 2024 regarding CP2030 capacities to 2030 and 2035. It includes the following levels: national, England & Wales, Scotland, Transmission and Distribution networks.
5. FES 2024 - Electricity supply data from FES24 Databook.
6. Interconnector and OHA projects – official data listing existing and future interconnector projects (as of December 2024).
7. NESO's internal datasets of the Contract for Difference Register and Capacity Market Register.
8. TEC Register data - Transmission entry capacity data extracted from NESO website.

Limitations of the data

1.7 Ofgem recognises that there are limitations on the completeness and accuracy of the data used, particularly because some of it is likely to have changed by the time of any implementation. However, Ofgem considers that by applying different scenarios, as part of its predictive exercise, the data is sufficient for us to reach reasonable conclusions on likely final impacts. Where we have made assumptions, we have stated where and what these are.

1.8 It is important to note that because the implementation of TMO4+ is currently underway and connections offers are being processed at the time of writing, 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.

[7] The CFI has been published on 05 November 2024. The proposal form is available in NESO website at: [Call for Input Financial Instrument Proposal - NESO]

1.9 This data is therefore the best available reflection Ofgem can obtain of projects and consumer impacts that are projected to be in scope of the CMP448 proposal. Thus, although the reformed connections queue is not known exactly, the data is accurate enough that key trends and impacts resulting from the theoretical activation of a PCF can be assessed.

2. Appraisal of Impacts

Overview of the proposal

2.1 For a more detailed explanation of the proposal see our Minded-to Consultation: Connection and Use of System Code (CUSC) CMP448: Introducing a Progression Commitment Fee to the Gate 2 Connections Queue, pages 11-14.

PCF Design

PCF profile

2.2 For the purpose of this impact assessment, we have considered the impacts of the PCF design which includes the PCF profile, its value and the activation metric.

2.3 NESO explained that the rationale for the PCF profile of six-monthly increase considered feedback from the CFI, as it provides an incentive to regularly assess project viability and leave the queue at the earliest opportunity if the need arises. To support this aim, the increments of the fee happen more frequently than the typical timeframe of queue management milestones.[8] We consider this is a sensible approach that ensures a more regular self-assessment of projects which is also aligned with the current securities arrangements with a bi-annual cadence as per CUSC section 15. Furthermore, as NESO pointed out in its analysis, this cadence works well with the timing of the gated application windows and has the potential to ensure a more efficient replacement of projects that are incentivised to exit the queue. This would result in minimal impact on Users and NESO from an administrative perspective.

2.4 We consider that an effective financial incentive to assess project viability could be beneficial to improve the status quo. However, this should happen at the earliest opportunity during the development stage of a project and minimise an overlap of securities that Users are required to provide when their project is progressed enough. A decision affecting project viability should also be largely in the developer's control. The duration of the PCF encompasses the period between Gate 2 Offer acceptance and the project's M1 date. After the project have passed M1 it will no longer be required to secure the PCF. In NESO's view this is the longest period that an unviable project could remain in the queue without adequate financial incentive

[8] As per CUSC section 16, the achievement of these milestones is necessary to avoid project termination

to leave proactively. We reviewed the current CUSC arrangements and agree with NESO's view for the reasons explained in the paragraphs below.

2.5 Milestone M1 has the second longest duration after Milestone M3 (Land Rights), which is typically achieved before M1. Furthermore, the achievement of M3 is among the minimum requirements to apply for a Gate 2 offer. Considering the reformed connections process, the achievement of M1 is calculated backward from the project completion dates or forward from the date M3 is achieved, respectively this can take up to four or five years.

2.6 After the achievement of Milestone M2 (Secure Consent)[9] the period to meet the remaining queue management milestones becomes shorter towards the project completion date with periods varying between 3 to 21 months from the project completion date. Therefore, having an additional PCF at those stages would bring marginal benefits as projects are already incentivised to progress more frequently to avoid terminations and an additional financial liability on top of this incentive can also be perceived as disproportionate to demonstrate project commitment. Furthermore, M2 is largely beyond developer's control and achieving planning consent or not is a key factor for project viability. If the PCF was activated for failure to meet M2 it would have added a disproportionate burden at a point where project viability depends on the planning authority decision. Prior to achieving M1 instead, the developer is mostly in control over its project progression, and this constitutes an intermediate step in the development of a project and one of the earliest opportunities to proactively assess project viability. For a detailed breakdown of User progression milestones arrangements see CUSC section 16.3.[10]

2.7 We further considered the status quo under the User Commitment Methodology in CUSC, as per section 15, to establish whether this framework gives enough financial incentive to timely assess project viability during an intermediate stage of development of a project and we do not believe this is the case. Connections customers are required to pay a cancellation charge and secure that amount. This security regime is designed to protect the investment made by TOs to build the necessary network infrastructure to safely connect the User to the national electricity transmission system and to incentivise the progression of projects. Based on the status quo, the payment of cancellation charges has a trigger date, which is typically three financial years prior to when Users start to pay connection charges. The trigger date therefore implies an advanced development stage, where it is most likely that the developer has passed M2. Therefore, the securities related to current cancellation charges do not provide an incentive to assess project viability soon enough and even if the PCF could be activated at this stage it would bring marginal benefits to ensure a proactive exit from the queue, as securities already apply. Under the User Commitment Methodology the amount and start of security payments will depend on specific aspects of the project, taking into consideration attributable

[9] The duration of M2 is 30 months, or 2.5 years from the project completion date
[10] As set out in CUSC Section 16 - Queue Management Process

works and how much TOs have spent on the specific project. If the TOs are spending straight away the developers could be required to secure an amount 30 days after they sign their agreement.

2.8 Considering WACM 1 and WACM 2, the concept of the PCF profile based on an incremental fee with six-monthly increase and a cap which is applicable between Gate 2 offer acceptance and M1 date, is the same as original proposal. Therefore, the evaluation discussed in this section applies to both WACMs. However, because both WACMs reduce the PCF liability upon termination or capacity reduction this can have an impact on the overall incentive to influence the behaviour of exiting the queue or minimising capacity reduction.

PCF Value

2.9 Once activated, the original proposal sets the minimum and maximum PCF value respectively at £2,500/MW and £10,000/MW per project. In our view this aspect avoids discrimination on the basis of technology but the value of the PCF per se has an impact on the overall cost of the project.

2.10 NESO has established the PCF value using a “real option” analysis. This concept is mentioned in the Final Modification Report (FMR) of CMP448. NESO has shared with Ofgem the methodology and rationale underpinning the “real option” analysis, which has been produced after the conclusion of the Workgroup stage of CMP448. In that methodology NESO explains:

- Assumptions to calculate the value of the “real option”,
- Equation to calculate the “real option”, and
- how the proposed PCF value considers the “real option” to incentivise a proactive assessment of project viability to decide whether remaining in the connections queue.

2.11 The concept of the “real option” analysis and its methodology assumptions to calculate the PCF value are summarised in Appendix 1.

Calculation of “real option” value

2.12 Ofgem considers the assumptions discussed in Appendix 1 reasonable to calculate the “real option” and sufficient to estimate the value of the “real option”. To do that, NESO calculates the value per £1 of discounted pre-commissioning costs, and then scales the result by the NPV of pre-commissioning costs of £500,000/MW, to obtain the option value in £/MW. As per the assumptions:

- today’s NPV of all post-commissioning cashflows is 98% of the NPV of all remaining pre-commissioning development expenditure (DEVEX, hereafter) and (capital expenditure (CAPEX, hereafter) costs, and

- the change in project NPV over six months is normally distributed with a mean of zero and a standard deviation of 3% of the NPV of all remaining pre-commissioning costs.

2.13 This means that the ratio of the post-commissioning cashflows to pre-commissioning costs after six months is a normally-distributed random variable with mean 0.98 and standard deviation 0.03. The distribution of this "project value" is illustrated in the graph below.

Figure 1 - Distribution of Future Project Values

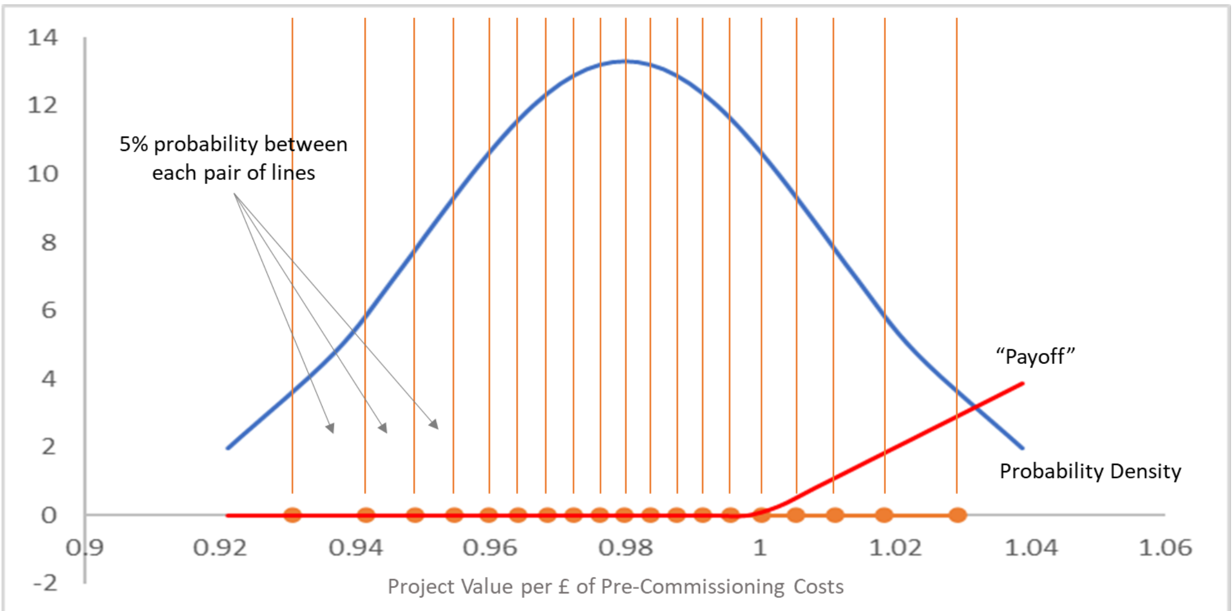

Figure 1 - 'Distribution of Future Project Value' depicts a graph that shows how future project value is expected to behave compared to pre-commissioning costs. The x-axis shows project value per £ of pre-commissioning costs (0.90 to 1.06). The y-axis shows probability density and payoff (-2 to 14). The probability density curve is tracked with a blue line. Payoff is tracked with a red line. Vertical orange lines divide the probability density into 20 equal areas and mark 5% probability intervals. The graph shows that financial return only begins when the project becomes profitable.

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Table 1 – Distribution of Future Project Value

Project Value per £ of Pre-Commissioning Costs	Approximate Payoff	Approximate Probability Density curve
0.92	0	2
0.94	0	6
0.96	0	10
0.98	0	13
1	0	10
1.02	1	6
1.04	4	4

2.14 NESO assumes that after six months the project will stop if the project value is less than 1 or it will otherwise progress if the value is greater than or equal to 1. The value of the "real option" is the expectation of the payoff, expressed in a mathematical and probability-weighed form. The project payoff curve is represented by a red line. Depending on where the project value sits in the probability distribution, NESO defines the payoff of the "real option" as:

- zero if the project value is less than 1; and
- if the project value is greater than or equal to 1, then the payoff is the amount of the project value in excess of 1 (which is the NPV of the project per £1 of pre-commissioning costs).

2.15 The probability distribution[11], as illustrated in figure 1, allows us to estimate the value of the "real option" and subsequently the PCF value. To do that however it is necessary to estimate the payoff at the midpoint between each of the areas of the probability density (the orange lines in the graph above). These 20 areas have equal area, each with 5% probability, which means that the option value is estimated as the sum of the 20 payoffs, each multiplied by 5%. NESO uses the Black-Scholes formula to estimate the individual payoff area, as this analytic equation is commonly used in finance to calculate the value of an option.

2.16 The Black-Scholes formula has the following equation:

$$C = N(d_1)S_0 - N(d_2)Ke^{-rt}$$

[11] In statistics, a probability distribution is a function describing the likelihood of different outcomes in a random experiment. The probability distribution summarises how probabilities are distributed across all possible values that a random variable can take

2.17 The PCF value is given by the following equation:

$$PCF = CS_1$$

2.18 Where:

- $S_1 = 500,000$ (the NPV of all pre-commissioning CAPEX and DEVEX costs, £/MW of capacity);
- $S_0 = 98\%$ (the present value of all future post-commissioning cashflows, as % of future pre-commissioning costs, discounted to today);
- $K = 1$ (Required value of future post-commissioning cashflows in 6 months necessary for project to continue, as % of future pre-commissioning costs, discounted to today);
- $Sigma = 3\%$ (Standard deviation of 6-month change in project NPV per £ of discounted remaining pre-commissioning costs);
- $t = 1$ (Measurement of Time, 6-month periods);
- $r = 0$ (Interest rate, as %);
- $$d_1 = \frac{\ln\frac{S_0}{K} + (r + \frac{\sigma^2}{2})t}{\sigma\sqrt{t}}$$
- $$d_2 = d_1 - \sigma\sqrt{t}$$

"Real option" and PCF value

2.19 Based on the parameters above, the Black-Scholes calculation gives the following values:

- **C** = 0.004437, which is option value per £ of pre-commissioning capex and devex, discounted to today
- **PCF** = 2,218.647, which is the "option to delay" (or real option) value per MW of project capacity

2.20 The PCF value set at £2,500/MW is a result of all of the assumptions described in the previous subsection (Methodology assumptions). This is the initial value for the first six months post-activation. This means that the PCF will start at £2,500/MW, will increase by £2,500/MW every six months until it reaches £10,000/MW. We consider that the PCF value and profile provide a sufficient incentive to assess project viability regularly, as the PCF value sits above the "real option" value. Furthermore, NESO had originally proposed a flat fee of £20,000/MW applicable at Gate 2 entry, however it lowered that figure, following the feedback received in the CFI which suggested that a termination fee of £20k/MW could disproportionately impact small developers, who may find it more challenging to secure against a £20k/MW fee at early stages of development. We agree with the views expressed in the CFI and consider that the proposed choice of an incremental fee, capped at £10K/MW, does not disproportionately impact small size developers, this is based on the assumption that the PCF value has been set out to sufficiently test the viability of projects incentivising a regular assessment of their viability and does not discriminate against the technology or size of the project. We consider the impact on small developers further below in section 3, specifically in the subsection covering the impact on competition.

WACMs Considerations

2.21 WACM1 reduces the PCF value set out in the Original Proposal by 90% and sets the PCF at £0/MW for the first six months once the PCF is activated[12] and we consider that WACM1 would significantly reduce the burden to finance the PCF for all projects in the queue (compared to the Original Proposal). However, WACM1 does have the potential to undermine the benefit CMP448 is trying to achieve, that is to say, to regularly assess project viability and self-terminate early if the project becomes unable to connect. This is because despite WACM1 still incentivising a regular assessment of project viability (since there are six-monthly increases and a cap on the PCF value) the value could be too low to incentivise the correct decision on project viability soon enough, and a decision could be further delayed by six months as the PCF will be initially set to £0/MW.

2.22 The value of the "real option" in the Original Proposal, based on project CAPEX costs of £500,000 per MW of solar and battery projects, showed that the value of the "option to delay" is £2,218.65/MW.[13] Following the PCF activation, WACM1 proposes to have the first increment at £250/MW and a maximum PCF value of £1,000/MW which sits well below the value of the "real option" calculated in the Original Proposal. The methodology for the PCF value of WACM1 is not detailed in the WACM form submitted to Ofgem, and assumes that a developer spends typically £1m on a transmission-connected battery development of 400MW. We can infer that this equals to developer costs of £2,500/MW. The proposer of WACM1 also argues that the Original Proposal of CMP448 will result in a PCF of £4m for a 400MW project, which in the Proposer's view represents a 400% increase in typical development costs. We do not have enough information about how the Proposer reached this conclusion, but we can assume that this amount is based on financing the PCF at its maximum value of £10k/MW. The Proposer also argued that the financing rate of the PCF is assumed to be 15% over two years, resulting in £1.2m additional project costs. However, we do not have enough information about the methodology and assumptions to validate the PCF value of WACM1, and we anticipate that most developers in the queue would not be required to securitise the maximum amount of the PCF after two years, as this would be required typically for large and more complex projects such as offshore wind. We also assume that a battery project typically would follow the standard Town and Country Planning route and is required to meet M1 within two years from the date it has achieved M3 to avoid termination, as per current CUSC arrangements. In this scenario, if the PCF is activated a battery project is more incentivised to assess project viability and exit the queue earlier

[12] The legal text of CMP448 defines this period as the "First PCF period"
[13] Value rounded up to the second decimal point

under the Original Proposal, compared to WACM1. Furthermore, a viable project would have the PCF securitised amount returned once it has achieved M1.

2.23 WACM2 retains the PCF profile and value of the Original Proposal, therefore the impact of this WACM against both the Original Proposal and WACM1 will be assessed considering the PCF liability exposure due to termination at or before the M1 date. This aspect will be covered in the session covering the impact of the PCF on project archetypes.

Activation Metric

2.24 We agree with NESO's view that it is uncertain to establish how common the problem of projects not progressing will be in the Gate 2 connections queue. Therefore, we consider that a proposal designed to activate the PCF if non-progression is prevalent will minimise the impact on developers and improve the reliability of the connections queue in the event the PCF is activated, which will be beneficial for TOs network infrastructure planning.

2.25 NESO proposes to measure the activation metric across Great Britain (GB) and across all technology types. We consider this is a reasonable choice that ensures that developers do not shift away investments on specific technologies or regions and are not discriminated by technology or region.

2.26 The activation metric is based on a cumulative figure that measures queue health with respect to project progression to queue management milestone M1, linked to capacity termination and self-terminations will not count towards the metric.[14] We consider that this metric is a strong indication of the prevalence of unviable projects in the connections queue. Furthermore, this metric will be measured during an initial five-year period, from the date of implementation to 31 December 2030 inclusive (should CMP448 be approved), and then for each five-year period thereafter. NESO will also regularly measure and publish the metric figure every six months. We anticipate that an activation metric regularly published provides transparency to industry in relation to when the PCF is likely to be activated.

2.27 Finally, we consider that a cumulative metric value allows NESO to target a total "allowable" threshold, which can take into account in-year variation and cumulative impacts of attrition over time. A cumulative total over a five-year period also aligns the metric period with the window to achieve CP2030 (31 December 2030).

Activation Threshold

2.28 The PCF can be activated only after a pre-defined activation threshold is met. The activation threshold is set at 6.5GW of terminated capacity. This predefined value represents 5% of the additional capacity (ie capacity that is not already installed) that is required to be connected before the end of 2030 in order to meet CP30

[14] This is because self-termination based on project unviability is the behaviour incentivised by the proposal

targets. NESO has estimated this capacity using the DESNZ 2030 Capacity Range compared to installed capacity in 2024.[15]

2.29 However, even if the threshold is met, NESO will decide whether to activate the PCF or not and Ofgem will have the power to override NESO's decision. We consider that this activation threshold and governance would support the achievement of CP2030 whilst improving investors' confidence. This is because the PCF will be activated only when CP2030 is potentially at risk and if NESO and Ofgem believe that a decision to activate the PCF will not deteriorate the market conditions of the time, as these could have influenced project terminations. These include, for example, supply chain constraints or external economic shocks.

2.30 If the PCF is not activated by the end of the initial metric period, NESO will review the activation threshold ahead of each subsequent five-year period. This is a sensible solution to improve the efficiency of the proposal to evaluate the appropriate level of capacity termination as a proxy of project unviability for a healthier queue.

WACMs Considerations

2.31 WACM1 and WACM2 retain the activation metric and threshold of the PCF as per the Original Proposal. Therefore, the same arguments discussed above apply to both WACMs.

Impact on Project Archetypes

Costs of financing the PCF for project archetypes

Overview of the analysis

2.32 NESO has estimated the cost of financing the PCF as a proportion of DEVEX. To evaluate the impact of the PCF on projects, NESO has made several assumptions and based its analysis on the information provided by respondents of the CFI. NESO has provided an illustrative PCF financing scenario as well as an impact analysis on four project archetypes considering lower-bound, middle-case and upper-bound scenarios. This analysis also includes the impact of the WACMs. Furthermore, to ease the comparison across WACMs and the Original Proposal, NESO has also produced an analysis that considers the PCF liability exposure due to termination at or before the M1 date.

Illustrative financing scenario

2.33 NESO's assumptions are the following:

- **Total DEVEX is £10k/MW**. This is a low figure selected from the CFI responses, to illustrate a potential worst-case scenario of the PCF financing cost as a percentage of DEVEX.

[15] As set out in Clean Power 2030 Action Plan: Connections reform annex, pages 9 and 10

- **Financing Period is 24 months** from joining the Gate 2 queue to passing Milestone M1.
- **Security Financing rate is 8%** per annum.

2.34 With these assumptions, NESO has estimated that the additional cost to finance the PCF will be £1,000/MW or 10% of DEVEX.

2.35 Ofgem recognises that there may be limitations in the quality of data used, since the main data source for this model is based on the responses of the CFI. However, because there is no legal requirement for developers to provide such information and Ofgem or NESO do not have detailed information of projects costs and or profitability, Ofgem is satisfied that for the impact evaluation of this proposal that NESO has used the best available data.

2.36 The DEVEX input used in this analysis considered low and upper bounds of DEVEX by pounds per megawatt. Considering the average of bounds for each project, these values range from DEVEX £1.2k/MW to DEVEX £300k/MW, as shown in table 2.

Table 2 – Range of CFI DEVEX Input (CFI DEVEX estimates for Batteries, Solar, Onshore Wind and Offshore Wind)

DEVEX (£k/MW)	Range of Developer DEVEX Inputs to the CFI
0-50	38
51-100	2
101-150	0
151-200	1
201-250	0
251-300	1

2.37 Considering the assumed financing rate, the CFI responses that reported overall cost of capital ranged from 7% to 13%, excluding outliers. NESO selected an 8% nominal figure based on the assumption that the financing costs for acceptable securities would be based on the cost of debt, and that 8% is a conservative estimate. Ofgem assumes that the average project in the queue would finance the PCF via debt.[16] However, the Authority does not have financial data for each project in the queue, including weighed cost of capital (WAAC) and their preferred financing methods (ie financing by equity or debt), therefore cannot evaluate if the 8% nominal figure is conservative or generous. That being said, the Authority is satisfied that this nominal

[16] Debt financing means borrowing money that must be repaid with interest. This interest is subject to an interest rate and is often calculated considering the repayment time

figure is reasonable to evaluate the financial impact of the PCF on the average projects in the connections queue. This is because, as shown in more detail in the middle-case scenarios presented in next subsection, NESO's analysis uses an 8% financing rate over 2 years for solar projects, 1.5 years for battery projects, 2 years for onshore wind, and 3.5 years for offshore wind, reflecting the fact that larger projects like offshore wind typically have longer financing periods, due to their scale and developer's intricacy. Therefore, in our view the financing cost of the PCF presented in the middle case scenarios, as intended in the Original Proposal and both WACMs, is not unduly burdensome for the average developer in the connections queue.

2.38 During the development stages of the CMP448 proposal, Workgroup members[17] requested NESO to provide an additional impact analysis on the costs of financing the PCF that considered an extended financing rate up to 20% over five years. The result of that analysis is reported in the FMR of CMP448.[18]

2.39 The security financing rates reported vary from 6% to 20% and the financing periods consider six months (0.5 years) to five years. Based on those ranges the PCF security financing costs range from £75/MW to £8500/MW. We consider that each project in the queue will have its own financing rate and financing period. Therefore, in our view what NESO presented provides a more comprehensive picture of the likely impact of financing the PCF, albeit we cannot be certain of which rate will apply to each project and what is the financing period. That being said, considering the extreme cases of the ranges considered, in our view large projects are more likely to have longer financing periods and lower financing rates because are typically developed by developers with better access to capital and lower risk profiles. On the other hand, small projects could face higher financing rates and shorter financing periods because of higher perceived risk and less negotiating power with lenders.

Cost of financing the PCF considering project archetypes

2.40 In addition to what has been presented during the CMP448 workgroups, NESO has evaluated the additional impact of the PCF on four project archetypes. These are: solar, battery, onshore wind and offshore wind, representing the four main categories of technologies in the connections queue. For each of the project archetypes NESO has considered a lower-bound, middle-case and upper-bound scenario. This analysis is inclusive of the impact of both WACMs.

2.41 The assumptions underlying the impact on project archetypes are shown from tables 3 to 6.

[17] CMP448, as many other industry code modifications, required the establishment of workgroups. These are composed by interested parties and experts to support the development of the code modification proposal.
[18] See CMP448 - Final Modification Report, page 41

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Table 3 – Solar Project Archetype

Assumptions Scenario	Financing Rate	Financing Period (Years)	Total DEVEX £/MW[19]
Lower Bound	6%	1	£20,339
Middle Case	8%	2	£20,339
Upper Bound	14%	3	£20,339

Table 4 – Battery Project Archetype

Assumptions Scenario	Financing Rate	Financing Period (Years)	Total DEVEX £/MW
Lower Bound	6%	1	£14,393
Middle Case	8%	1.5	£14,393
Upper Bound	14%	2	£14,393

Table 5 – Onshore Wind Project Archetype

Assumptions Scenario	Financing Rate	Financing Period (Years)	Total DEVEX £/MW
Lower Bound	6%	1	£31,830
Middle Case	8%	2	£31,830
Upper Bound	14%	3	£31,830

[19] In tables 2 to 5, the total DEVEX/MW is based on the average value calculated using the CFI responses that have provided such data

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Table 6 – Offshore Wind Project Archetype

Assumptions Scenario	Financing Rate	Financing Period (Years)	Total DEVEX £/MW
Lower Bound	6%	2	£191,667
Middle Case	8%	3.5	£191,667
Upper Bound	14%	5	£191,667

2.42 Based on those assumptions, NESO has calculated the financial impact that the PCF security will have on the project archetypes as a percentage of DEVEX. Tables 7 to 9 show the result of these impacts for each scenario considering the Original Proposal and the WACMs.

2.43 Tables 7 to 9 consider PCF liability exposure as a percentage of DEVEX. The concept of PCF liability is related to the amount a developer is required to pay if it exits the Gate 2 queue after the PCF has been activated and prior to meeting M1. The liability analysis is an additional lens to assess the impact of WACM2. The reason is that WACM2 only impacts liability upon self-termination rather than PCF financing costs, therefore NESO has provided this additional analysis to show a more direct comparison of the WACMs against the Original Proposal. The results shown in tables 7 to 9 consider the maximum liability, however given that the PCF profile is subject to six-monthly increases and a cap, the PCF liability will follow the same pattern of six-monthly increments until it reaches its maximum value.

Table 7 – PCF Security impact of Original Proposal

PCF Cost as percentage of DEVEX

	Solar	Battery	Onshore Wind	Offshore Wind
Lower Bound	1.11%	1.56%	0.71%	0.39%
Middle Case	4.9%	4.2%	3.1%	1.1%
Upper Bound	15.5%	12.2%	9.9%	3.1%

Maximum Liability exposure as percentage of DEVEX

	Solar	Battery	Onshore Wind	Offshore Wind
Lower Bound	24.6%	34.7%	15.7%	5.2%
Middle Case	49.2%	52.1%	31.4%	5.2%
Upper Bound	49.2%	69.5%	31.4%	5.2%

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Table 8 – PCF Security impact of WACM1

PCF Cost as percentage of DEVEX

	Solar	Battery	Onshore Wind	Offshore Wind
Lower Bound	0.04%	0.05%	0.02%	0.02%
Middle Case	0.3%	0.2%	0.2%	0.1%
Upper Bound	1.2%	0.7%	0.8%	0.3%

Maximum Liability exposure as percentage of DEVEX

	Solar	Battery	Onshore Wind	Offshore Wind
Lower Bound	1.2%	1.7%	0.8%	0.4%
Middle Case	3.7%	3.5%	2.4%	0.5%
Upper Bound	4.9%	5.2%	3.1%	0.5%

Table 9 – PCF Security impact of WACM2

PCF Cost as percentage of DEVEX

	Solar	Battery	Onshore Wind	Offshore Wind
Lower Bound	1.11%	1.56%	0.71%	0.39%
Middle Case	4.9%	4.2%	3.1%	1.1%
Upper Bound	15.5%	12.2%	9.9%	3.1%

Maximum Liability exposure as percentage of DEVEX

	Solar	Battery	Onshore Wind	Offshore Wind
Lower Bound	6.1%	8.7%	3.9%	1.3%
Middle Case	12.3%	13.0%	7.9%	1.3%
Upper Bound	12.3%	17.4%	7.9%	1.3%

2.44 For completeness, considering middle case scenarios, NESO has provided examples with absolute values and assumptions, with are reported in tables 10-13.

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Table 10 – Illustrative Solar middle case scenario with absolute values

Parameter	Original Proposal	WACM 1	WACM 2
Total TEC (MW)	200	200	200
Total DEVEX (£)	4,067,857	4,067,857	4,067,857
PCF cost as % of DEVEX	4.9%	0.3%	4.9%
Max: PCF liability as % of DEVEX	49.2%	3.7%	12.3%
Total PCF financing cost (£)	200,000	12,000	200,000
Total PCF financing cost (£)	2,200,000	180,000	2,200,000

Table 11 – Illustrative Battery middle case scenario with absolute values

Parameter	Original Proposal	WACM 1	WACM 2
Total TEC (MW)	150	150	150
Total DEVEX (£)	2,158,952	2,158,952	2,158,952
PCF cost as % of DEVEX	4.2%	0.2%	4.2%
Max: PCF liability as % of DEVEX	52.1%	3.5%	13.0%
Total PCF financing cost (£)	90,000	4,500	90,000

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Table 12 – Illustrative Onshore Wind middle case scenario with absolute values

Parameter	Original Proposal	WACM 1	WACM 2
Total TEC (MW)	100	100	100
Total DEVEX (£)	3,183,000	3,183,000	3,183,000
PCF cost as % of DEVEX	3.1%	0.2%	3.1%
Max: PCF liability as % of DEVEX	31.4%	2.4%	7.9%
Total PCF financing cost (£)	100,000	6,000	100,000

Table 13 – Illustrative Offshore Wind Solar middle case scenario with absolute values

Parameter	Original Proposal	WACM 1	WACM 2
Total TEC (MW)	1,000	1,000	1,000
Total DEVEX (£)	191,666,667	191,666,667	191,666,667
PCF cost as % of DEVEX	1.1%	0.1%	1.1%
Max: PCF liability as % of DEVEX	5.2%	0.5%	1.3%
Total PCF financing cost (£)	2,200,000	180,000	2,200,000

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Key considerations

2.45 Considering the Original Proposal, the PCF security financing costs across the scenarios range from 0.71% to 15.5% of project DEVEX. This indicates that the cost of financing the PCF security is unlikely to be unduly burdensome on developers. The upper bound scenarios for solar and batteries exceed 10%, but this should not unduly impact project viability. The Original Proposal also has the highest liability between 5.2% and 69.5%, widely varying across all project archetypes. This means that the Original Proposal provides the strongest incentive for developers to proactively exit the queue in a timely manner, when compared to both WACMs.

2.46 WACM1 significantly reduces the PCF security financing costs between 0.02% and 1.2% of DEVEX across all archetypes, compared to the original proposal. This happens because it introduces a six-month grace period with a PCF charge set at £0/MW, capping also the PCF at £1,000/MW, which is 10% of the value of the Original Proposal. WACM1 significantly reduces also the maximum PCF liability across all archetypes and with a significantly reduced range of exposures across technologies. The maximum liability exposure is between 0.4% and 5.2% of DEVEX. The reduced financing cost and liability is likely to weaken the incentive for developers to proactively exit the queue, consequently reducing the benefits the PCF would have on timelines for viable projects to connect to the grid. Therefore, we consider that whilst WACM1 has the lowest impact on the PCF financing costs and liability, it may lack the strength to sufficiently influence the developer behaviour to restore the queue to a healthy state, should the queue be unhealthy.

2.47 WACM2 retains the PCF security financing costs of the Original Proposal but has a reduced liability exposure compared to Original Proposal. This is because it introduces a 75% liability discount if a project initiates self-termination at least 90 days prior to the M1 date. WACM2 has a wide maximum liability range, between 1.3% and 17.5% of DEVEX, which varies widely by technology type. We consider that a 75% discount for early self-termination incentivises a proactive assessment of project viability better than WACM1. However, as opposed to the incentive of the Original Proposal, the discount could also incentivise projects to exiting the queue close to the 90 days prior to the M1 date. This may undermine the proposal's objective of encouraging timely exit, should the queue become unhealthy.

Activation Forecasting

Overview of the analysis, methodology and assumptions

2.48 The CMP448 solution (inclusive of all WACMs) sets the PCF activation threshold at a cumulative total of 6,500MW for an initial metric period lasting until the end of 2030. This value represents the equivalent of approximately 5% of the additional network capacity (intended as capacity that is not already installed) that is required to be connected before the end of 2030 to meet CP2030 targets. In the Proposer's view, the activation threshold should be sensitive enough to ensure that it:

- will be met if there is a high prevalence of project non-progression;
- will not be met if this issue is not prevalent in the future Gate 2 queue.

2.49 Therefore, NESO has developed the activation forecast analysis to inform the value of the activation threshold. To do that NESO used a range of average project attrition rates (considered as a proxy for queue health) for those projects in scope of the PCF, to indicate when the activation threshold would be met. However, as per CP2030, GB has technology capacity constraints at both regional and national levels, impacting the activation forecasting. For this reason, NESO estimated the proportion of the Gate 2 queue[20] that will be in scope for the PCF, providing both a national (GB) and regional view to apply the modelled attrition rates based on national and regional capacity limits. The regional analysis has not been presented to workgroups.

2.50 The methodology followed by NESO to forecast the PCF activation threshold included the following steps: Estimate the profile of the Gate 2 queue.

1. Estimate the profile of the Gate 2 queue.
2. Estimate the profile of the Gate 2 queue that will be in scope for the PCF.
3. Approximate the distribution of M1 dates of projects in the Gate 2 queue in scope for the PCF.
4. Estimate likely average attrition rates that would be required for the activation threshold value of 6.5 GW to be met during a specific time period.

2.51 To estimate the activation threshold, NESO has made several assumptions. Considering the estimation of the Gate 2 composition, NESO has assumed that the projects in the current queue will apply for and be allocated network capacity based on:

- The Allowed capacity for each technology type in 2035 as set out in CP2030. This means that any MW capacity above the allocated capacity will not be allocated a position in the Gate 2 queue (not accounting for zonal substitution of rebalancing).
- The project maturity. This means that those projects that already have planning consents will receive capacity ahead of those that do not.
- Connection date. This means that projects with earlier connection dates will receive capacity ahead of those with later dates. Projects with connection dates between 2026-2035 inclusive are included in the analysis.

2.52 The data source for this analysis is listed in paragraph 1.6 above and includes the numbered bullet points 2 - 8.

[20] At the time of writing, the composition of the Gate 2 queue is not known yet

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2.53 The activation threshold does not change across the Original Proposal and all the WACMs in the CMP448 proposal. Therefore, the impact of the results of this analysis applies equally to original proposal, WACM1 and WACM2.

2.54 Based on the assumptions above NESO estimates the proportion of the queue in scope of the PCF accounting for CP2030 capacity targes at GB and regional level, considering base case and high case scenarios. The proportion of the queue changes across scenarios and GB and regional levels. At GB level NESO estimated the capacity to be in scope of the PCF between 86.3GW and 115.6GW representing respectively 54% and 72% of the estimated queue. At regional level instead, the estimated capacity in scope of the PCF ranges between 86.3GW and 115.6GW representing respectively 77% and 88% of the expected queue in scope of the PCF. This indicates also that there is a significant proportion of capacity in the projected Gate 2 queue that has not met M1 and that could include less viable projects. Therefore, having the PCF to incentivise regular assessment of project viability earlier than the status quo, could increase the benefits introduced by TM04+.

2.55 Using the calculated capacity in scope NESO has then estimated the distribution of the M1 dates to inform when the PCF threshold could be activated in both the base and high case analysis at GB and regional levels. NESO has also calculated average attrition rates that are necessary to meet the activation threshold from the 1st semester of 2026 (1H26) until the necessary time period that would lead to 6.5GW of cumulative attrition (that is, meeting the activation threshold).

2.56 Using the results of the national (GB) activation analysis, NESO has calculated that to meet the 6.5 GW activation threshold at the earliest opportunity, project attrition needs to be 33% or above. If the attrition rate is below 6% instead, no PCF activation will be required during the initial measurement period, hence indicating a "healthy queue".

2.57 A breakdown of the activation analysis and results is provided in the subsequent sections.

Estimated proportion of Connections Queue in scope for the PCF

National (GB) view

2.58 The actual Gate 2 composition is currently unknown. Using data from NESO's Impact Assessment NESO has estimated 587GW of network capacity present in the existing queue with connection dates between 2026 and 2040.[21] However, the total

[21] As set out in Impact Assessment Data (December 2024) which includes data from NESO FES Publication (2024), Transmission Connections Registers (September 2024), ENA distribution Databook (June 2024), Connections Reform Annex, NESO RFI Responses, NESO internal data sets, Regen NESO Transmission Pipeline Report

incremental capacity estimated by NESO up to 2035 to meet CP2030 targets is 161GW. This queue will then be filtered to produce the new Gate 2 queue as part of TMO4+ and the contracted connection date could change via that process. Figure 2 shows the estimated queue composition by M1 status and table 14 presents the actual queue composition by M1 in megawatts.

Figure 2 – Queue composition by M1

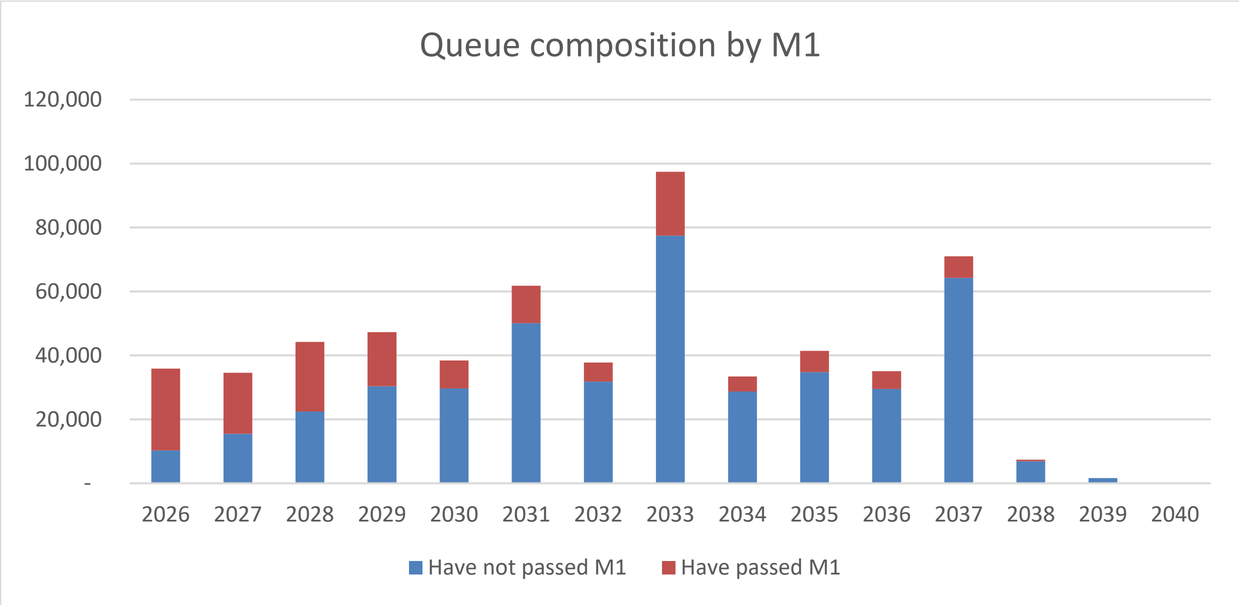

Figure 2 - 'Queue composition by M1' depicts a bar graph that shows the estimated queue composition from 2026 to 2040, tracking projects that have and have not passed Milestone 1. The x-axis shows a date for each year between 2026 and 2040. The y-axis projects capacity in MW and ranges from 20,000 to 120,000 in increments of 20,000. The blue colouring on the bar signifies projects that have not passed M1. The red colouring of the bar signifies projects that have passed M1. 'Have not passed' accounts for a larger share for every year from 2029-2040.

Table 14 – Queue Capacity (MW) with Connection Dates from 2026 to 2040

Year	Have not Passed M1 (MW)	Have Passed M1 (MW)	Total (MW)
2026	10,276	25,594	35,870
2027	15,500	19,070	34,569
2028	22,435	21,817	44,252
2029	30,359	16,898	47,258
2030	29,637	8,766	38,403
2031	50,099	11,678	61,777
2032	31,795	5,953	37,747
2033	77,461	19,972	97,432
2034	28,706	4,688	33,394
2035	34,791	6,653	41,444
2036	29,515	5,568	35,083
2037	64,231	6,768	70,999
2038	6,900	510	7,410
2039	1,625	-	1,625
2040	200		200
Total (MW)	**433,530**	**153,933**	**587,463**

2.59 This incremental capacity (161GW) is estimated by subtracting the current installed capacity (previously built capacity) and capacity with connection dates before 1 January 2026 from the 2035 Maximum Capacity scenario, as reported in the totals of table 15.

Table 15 – Estimated proportion of connections queue, Base and High Case National

Plant Type	Previously built capacity	Capacity with connection date 2024-2025	Calculated CP2030 maximum capacity (up to 2035) [22]
Batteries	4,550	6,856	29,000
LDES	2,900	-	10,000
Solar	16,940	4,556	69,000
Onshore Wind	15,640	1,741	37,000
Offshore Wind	14,800	4,888	89,000
Unabated Gas	35,600	2,890	-
Low carbon dispatchable power	4,300	-	25,000
Nuclear	1,230	1,120	6,000
Interconnectors	9,800	-	24,000
Other Renewables	-	185	-
Total	**105,760**	**22,236**	**289,000**

2.60 When estimating the proportion of the queue in scope NESO has considered base case assumptions and high case assumptions taking into account the available capacity for each technology type, and the proportion of the existing queue that has already met M1 for each technology type.

2.61 The **Base case assumptions** assume that all projects currently in the queue apply for and receive capacity in the Gate 2 queue, resulting in **86.8GW (54%)** of projects in scope for the PCF, of which **66.3GW** have M1 date before 2030.

2.62 The **high case assumptions** assume a lower success rate of projects moving from the current queue to the Gate 2 queue. This results in **115.6GW (72%)** of projects in scope for PCF, of which **92.9GW** have an M1 date before 2030. Figures 3 and 4 show the distribution of M1 dates on both base and high case analyses; where the vertical axis represents the capacity in megawatts and the horizontal axis represents the time period.[23]

[22] Values calculated by NESO as part of the activation analysis for CMP448 and based on CP2030 capacity limits

[23] In both charts, the horizontal axis represents the year and the semester. To this extent 26H1 should be read as "1st semester of year 2026", and so on

Table 16 – Incremental capacity and M1 distribution of capacity in scope of the PCF

Plant Type	Incremental capacity needed up to 2035[24] base case (MW)	Incremental capacity needed up to 2035[25] high case (MW)	M1 Distribution up to 2030 base case (MW)	M1 Distribution up to 2030 high case (MW)
Batteries	1,804	-	-	-
LDES	9,459	3,154	1,500	1,500
Solar	9,395	25,007	9,373	24,980
Onshore Wind	37,669	12,312	9,327	11,860
Offshore Wind	-	44,148	36,362	43,378
Unabated Gas	19,659	-	-	-
Low carbon dispatchable power	-	20,130	1,122	1,122
Nuclear	8,800	-	-	-
Interconnectors	-	10,800	8,630	10,030
Other Renewables	1,804	-	-	-
Total	**86,785**	**115,550**	**66,314**	**92,870**

[24] Ibid.
[25] Ibid.

Figure 3 – Base case Assumptions: M1 Distribution Date by Technology

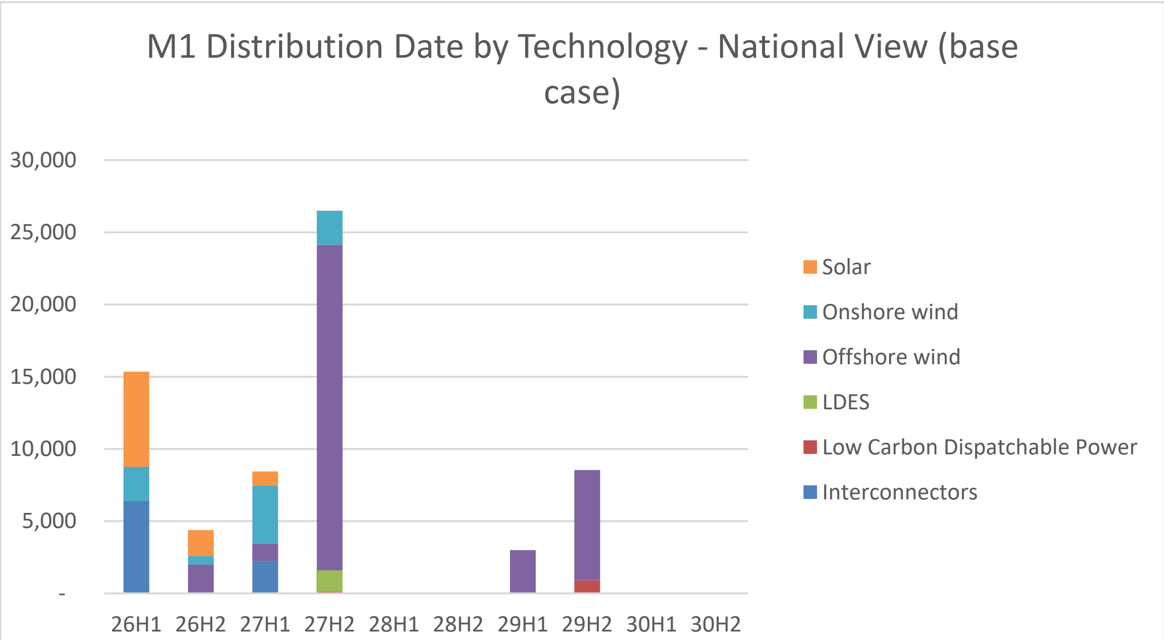

Figure 3 - 'Base case Assumptions: M1 Distribution Date by Technology' depicts a bar chart that compares the distribution dates of six technology types with the total MW in the Gate 2 queue in scope for the PCF, from a national perspective. The x-axis contains ten separate time periods, ranging biannually from 2026 to 2030. For example, 26H1 should be read as “1st semester of year 2026". The y-axis represents the total MW in the Gate 2 queue in scope for the PCF. The orange colouring represents solar, the light blue colouring represents Onshore Wind, the purple colouring represents Offshore Wind, the green colouring represents LDES, the red colouring represents Low Carbon Dispatchable Power, and the dark blue colouring represents Interconnectors. The chart highlights shift in the technology types over time, with Offshore Wind representing the largest share of MW in scope for the PCF in the second half of 2027.

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Table 17 – Base case Assumptions: M1 Distribution Date by Technology (National View)

M1 Date (MW Connecting)	26 H1	26 H2	27 H1	27 H2	28 H1	28 H2	29 H1	29 H2	30 H1	30H 2
Interconnectors	6400		2230							
Low Carbon Dispatchable Power			2	100				910	60	50
LDES				1500						
Offshore Wind		2000	1200	22535			3000	7627		
Onshore Wind	2366	590	4012	2359						
Solar	6580	1791	1002							
Total MW Connecting	15346	4381	8446	26494			3000	8537	60	50

Figure 4 – High case Assumptions: M1 Distribution Date by Technology

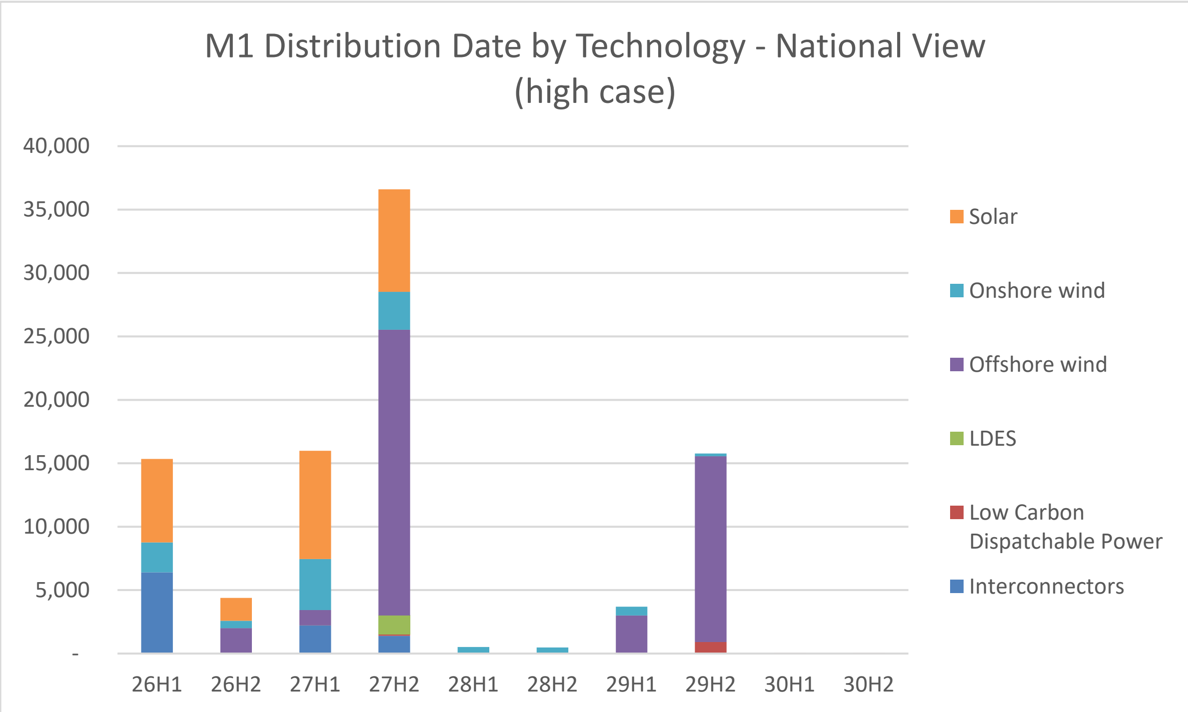

Figure 4 - 'High case Assumptions: M1 Distribution Date by Technology' depicts a bar chart that compares the distribution dates of six technology types with the total MW in the Gate 2 queue in scope for the PCF, from a national perspective. The x-axis contains ten separate time periods, ranging biannually from 2026 to 2030. For example, 26H1 should be read as "1st semester of year 2026". The y-axis represents the total MW in the Gate 2 queue in scope for the PCF. The orange colouring represents Solar, the light blue represents Onshore Wind, the purple colouring represents Offshore Wind, the green colouring represents LDES, the red colouring represents Low Carbon Dispatchable Power, and the dark blue colouring represents Interconnectors. Offshore Wind shows significant peaks in the second half of 2027. Solar also shows peaks from 2026 to 2027.

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Table 18 – High case Assumptions: M1 Distribution Date by Technology – National View

M1 Date (MW Connecting)	26 H1	26 H2	27 H1	27 H2	28 H1	28 H2	29 H1	29 H2	30 H1	30 H2
Interconnectors	6400		2230	1400						
Low Carbon Dispatchable Power			2	100				910	60	50
LDES				1500						
Offshore Wind		2000	1200	22535			3000	14643		
Onshore Wind	2366	590	4012	2987	514	483	690	219		
Solar	6580	1791	8537	8072						
Total MW Connecting	15345	4381	15981	36594	514	483	3690	15772	60	50

2.63 The distribution of the M1 dates informs when the PCF threshold could be activated in both the base and high case analysis. In both analyses, forward-calculated milestones have been excluded, because of limitations in the data available about planning type.

2.64 The main difference between base case and high case scenarios is that:

- **In the Base Case scenario**:
    - under the capacity limits applied, there are no projects in scope of the PCF (pre-M1) connecting in 2032, hence no M1 dates in 2028.
    - there is no "extra space" within capacity limits for 2035 for additional applications to enter the queue, other than via replacement.[4]
- **In the High Case scenario**:
    - there is only "extra space" for LDES within capacity limits for 2035 for additional applications to enter the queue, other than via replacement.[26]

[26] NESO has allocated network capacity to technology capacity limits ordered by connection date. Therefore, exact technology limits have not been met

Regional view

2.65 The regional activation analysis covers the regional capacity limits for Solar, Onshore Wind, and Batteries in Distribution and Transmission zones and does not consider zonal substitutions or rebalancing that will occur when the queue is formed. This fact may result in an overestimation of the capacity in scope for the PCF.

2.66 The regional analysis has excluded approximately 11GW of capacity, in both base and high case, because the data available presented some mismatch at either Transmission or Distribution regions.

2.67 The results of this analysis show that the total space needed to meet CP2030 up to 2035 is approximately between 124 and 141 GW (based on the base case or high case) when accounting for regional capacity limits, representing approximately between 77% to 88% of the expected queue in scope of the PCF. The national (GB) analysis however considered less space to be filled (86.8 GW and 115.6 GW for the base and high case scenarios respectively). The additional space considered in the regional analysis is required to be filled by new applicants. This means that total space to be filled by new applicants is approximately between 37-40GW (based on the base case or high case) in the regional analysis, as opposed to 0GW of the national (GB) analysis.

2.68 In the regional analysis, NESO has followed the same methodology of the GB analysis but applied it to regional technology limits. The difference in the results between GB and regional analysis is because some technologies could be over-subscribed on a national level, but in certain regions there is still space for that technology when considering regional limits. Then, NESO has considered the projects with the correct technology categorization of each region, in order of connection date, which may have later connections dates compared to the GB analysis. Hence the regional analysis has different and later distribution of M1 dates.

2.69 The expected space to meet CP2030 up to 2035 in each transmission and distribution region is shown in table 19. The new capacity (expected capacity required) that will need to be filled by new applicants in the Gate 2 queue is shown in table 20.

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Table 19 – Expected remaining space (MW) to CP2030 2035

Regional Zones	**Base Case Scenario (MW): Batteries**	**Base Case Scenario (MW): Solar**	**Base Case Scenario (MW): Onshore Wind**	**High Case Scenario (MW): Batteries**	**High Case Scenario (MW): Solar**	**High Case Scenario (MW): Onshore Wind**
T1 - N. Scotland	-	-	N/A	-	263	N/A
T2 - S. Scotland	-	227	N/A	-	427	N/A
T3 - N. England	-	-	N/A	-	-	N/A
T4 - N. Wales, the Mersey and the Humber	-	-	N/A	957	-	N/A
T5 - Midlands	-	-	N/A	-	-	N/A
T6 - Central England	-	-	N/A	-	1,061	N/A
T7 - E. Anglia	65	-	N/A	65	-	N/A
T8 - S. Wales and the Severn	-	-	N/A	-	-	N/A
T9 - S.W. England	-	-	N/A	-	-	N/A
T10 - S. England	-	-	N/A	-	-	N/A
T11 - South-East England	-	-	N/A	-	-	N/A
D1 - SSEN - SHEPD	-	622	N/A	-	758	N/A
D2 - SP Distribution	-	1,005	N/A	-	1,068	N/A
D3 - ENWL	-	2,139	N/A	-	2,139	N/A
D4 - NPG	-	3,121	N/A	-	3,722	N/A
D5 - SPEN Manweb	-	1,918	N/A	15	1,918	N/A
D6 - NGED	-	14,128	N/A	-	14,616	N/A
D7 - SSEN - SEPD	1,212	6,198	N/A	1,212	6,198	N/A
D8 - UKPN	-	8,913	N/A	-	9,474	N/A
Scotland			3,328			5,793
England and Wales			13,512			13,964
Regional Sub-Totals	**1,277**	**38,272**	**16,840**	**2,249**	**41,643**	**19,757**

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Table 20 – Expected capacity required (MW) to be filled by new applications not already in the Gate 2 queue to meet the CP2030 2035

Regional Zones	Base Case Scenario (MW): Batteries	Base Case Scenario (MW): Solar	Base Case Scenario (MW): Onshore Wind	High Case Scenario (MW): Batteries	High Case Scenario (MW): Solar	High Case Scenario (MW): Onshore Wind
T1 - N. Scotland	-	-	N/A	-	68	N/A
T2 - S. Scotland	-	26	N/A	-	226	N/A
T3 - N. England	-	-	N/A	-	-	N/A
T4 - N. Wales, the Mersey and the Humber	-	-	N/A	549	-	N/A
T5 - Midlands	-	-	N/A	-	-	N/A
T6 - Central England	-	-	N/A	-	191	N/A
T7 - E. Anglia	65	-	N/A	65	-	N/A
T8 - S. Wales and the Severn	-	-	N/A	-	-	N/A
T9 - S.W. England	-	-	N/A	-	-	N/A
T10 - S. England	-	-	N/A	-	-	N/A
T11 - South-East England	-	-	N/A	-	-	N/A
D1 - SSEN - SHEPD	-	28	N/A	-	17	N/A
D2 - SP Distribution	-	186	N/A	-	248	N/A
D3 - ENWL	-	1,901	N/A	-	1,901	N/A
D4 - NPG	-	34	N/A	-	375	N/A
D5 - SPEN Manweb	-	1,709	N/A	15	1,709	N/A
D6 - NGED	-	9,757	N/A	-	10,245	N/A
D7 - SSEN - SEPD	1,212	6,198	N/A	1,212	6,198	N/A
D8 - UKPN	-	5,960	N/A	-	6,521	N/A
Scotland			296			53
England and Wales			9,932			10,384
Regional Sub-Totals	**1,277**	**25,799**	**10,288**	**1,841**	**27,698**	**10,437**

2.70 Considering the base case scenario, the total capacity is 66.7GW, as opposed to 66.3GW capacity in GB base case. This occurs because Solar and Onshore Wind regional capacities have led to an increased queue relative to GB limits. Figure 5 shows the distribution of M1 dates in the base case of the regional analysis.

2.71 In the high case scenario instead, the total capacity is 79.7GW, as opposed to 92.9GW capacity in GB high case. This occurs because Solar and Onshore Wind regional capacities have led to a decreased queue relative to GB limits. Figure 6 shows the distribution of M1 dates in the high case of the regional analysis.

Figure 5 – Distribution of M1 dates in the regional analysis (base case)

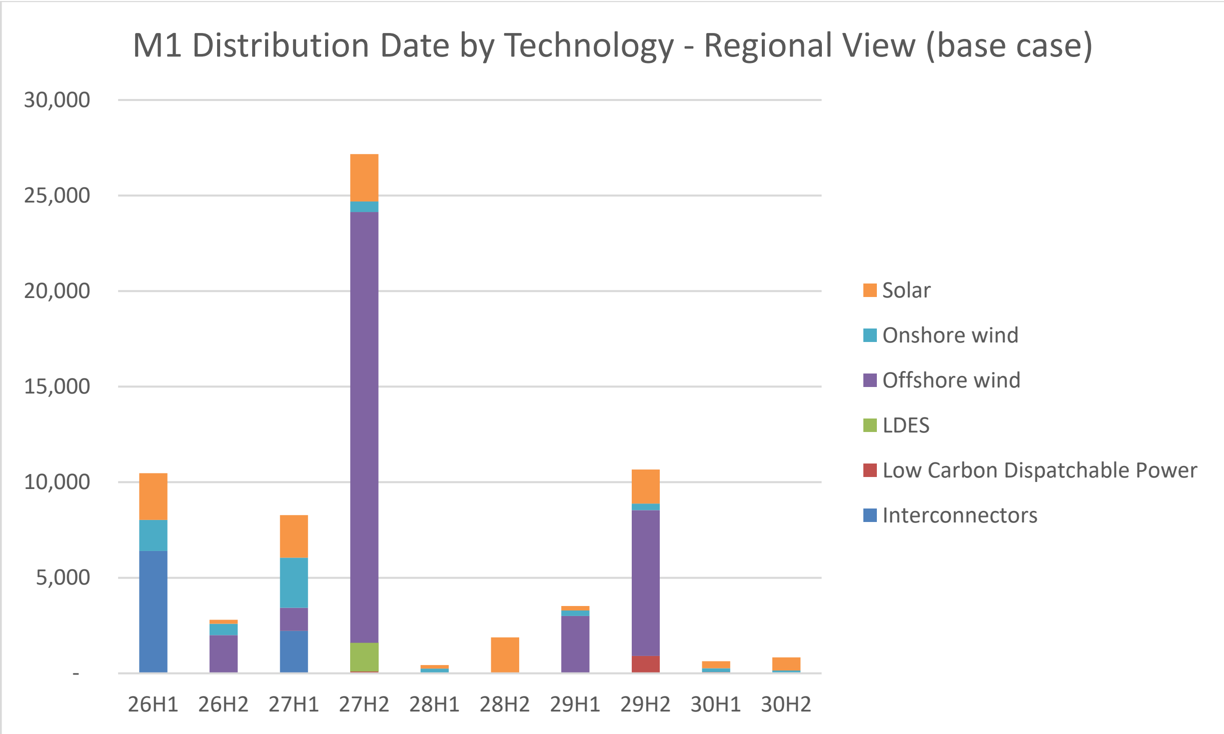

Figure 5 - 'Distribution of M1 dates in the regional analysis (base case) depicts a bar chart that compares the distribution dates of six technology types with the total MW in the Gate 2 queue in scope for the PCF, from a regional perspective. The x-axis contains ten separate time periods ranging biannually from 2026 to 2030. For example, 26H1 should be read as "1st semester of year 2026". The y-axis represents the total MW in the Gate 2 queue in scope for the PCF. The orange colouring represents Solar, the light blue represents Onshore Wind, the purple colouring represents Offshore Wind, the green colouring represents LDES, the red colouring represents Low Carbon Dispatchable Power, and the dark blue colouring represents Interconnectors. Offshore Wind shows considerable peaks in the second half of 2027 and the second half of 2029.

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Table 21 – Distribution of M1 dates in the regional analysis (base case) – Regional View

M1 Date (MW Connecting)	26 H1	26 H2	27 H1	27 H2	28 H1	28 H2	29 H1	29 H2	30 H1	30 H2
Interconnectors	6400		2230							
Low Carbon Dispatchable Power			2	100				910	60	50
LDES				1500						
Offshore Wind		2000	1200	22535			3000	7627		
Onshore Wind	1627	590	2618	554	250	30	290	345	208	100
Solar	2247	211	2228	2484	183	1855	231	1785	362	687
Total MW Connecting	10474	2801	8278	27173	433	1885	3521	10667	630	837

Figure 6 – Distribution of M1 dates in the regional analysis (high case)

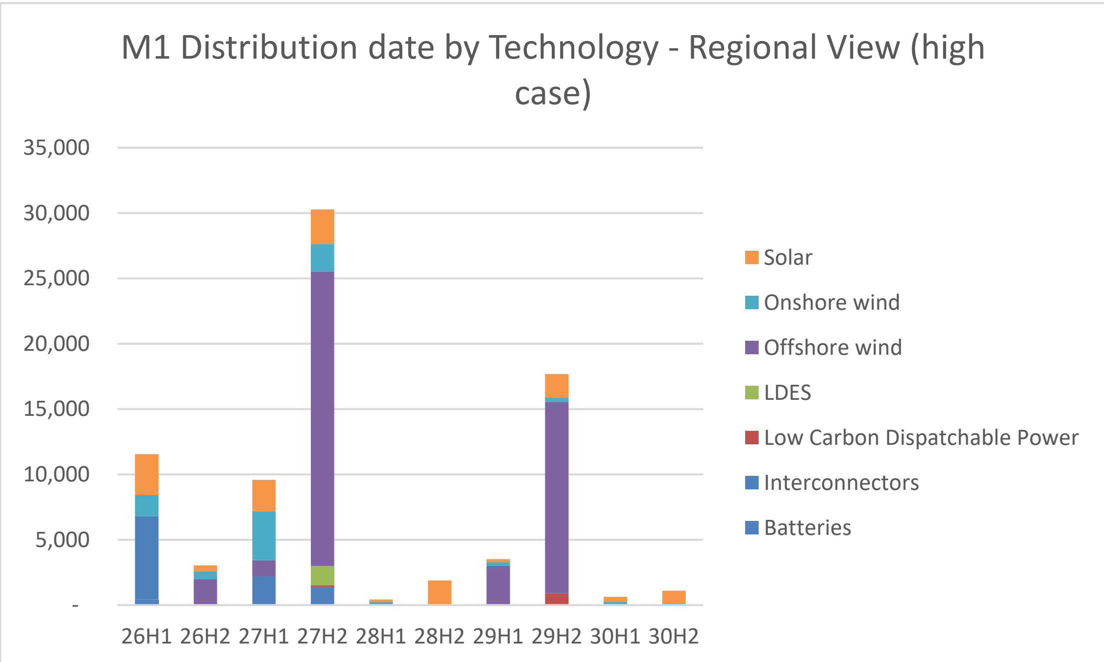

Figure 6 - 'Distribution of M1 dates in the regional analysis (high case) depicts a bar chart that compares the distribution dates of six technology types, with the total MW in the Gate 2 queue in scope for the PCF from a regional perspective. The x-axis contains ten separate

time periods, ranging biannually from 2026 to 2030. For example, 26H1 should be read as "1st semester of year 2026". The y-axis represents the total MW in the Gate 2 queue in scope for the PCF. The orange colouring represents Solar, the light blue represents Onshore Wind, the purple colouring represents Offshore Wind, the green colouring represents LDES, the red colouring represents Low Carbon Dispatchable Power, and the dark blue colouring represents Interconnectors. Offshore Wind shows considerable peaks in the second half of 2027 and the second half of 2029.

Table 22 - Distribution of M1 dates in the regional analysis (high case) – Regional View

M1 Date (MW Connecting)	26H1	26H2	27H1	27H2	28H1	28H2	29H1	29H2	30H1	30H2
Batteries	408									
Interconnectors	6400		2230	1400						
Low Carbon Dispatchable Power			2	100				910	60	50
LDES				1500						
Offshore Wind		2000	1200	22535			3000	14643		
Onshore Wind	1627	590	3766	2115	250	30	290	345	208	100
Solar	3122	451	2378	2631	183	1855	231	1785	362	947
Total MW Connecting	11557	3041	9576	30281	433	1885	3521	17683	630	1097

2.72 The diagrams in figures 7 and 8, provide an example of why the overall Gate 2 capacity changes when comparing national (GB) and regional limits. The example focuses on solar technology for both base and high case.

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Figure 7 – Solar example capacity change between national and regional (base case)

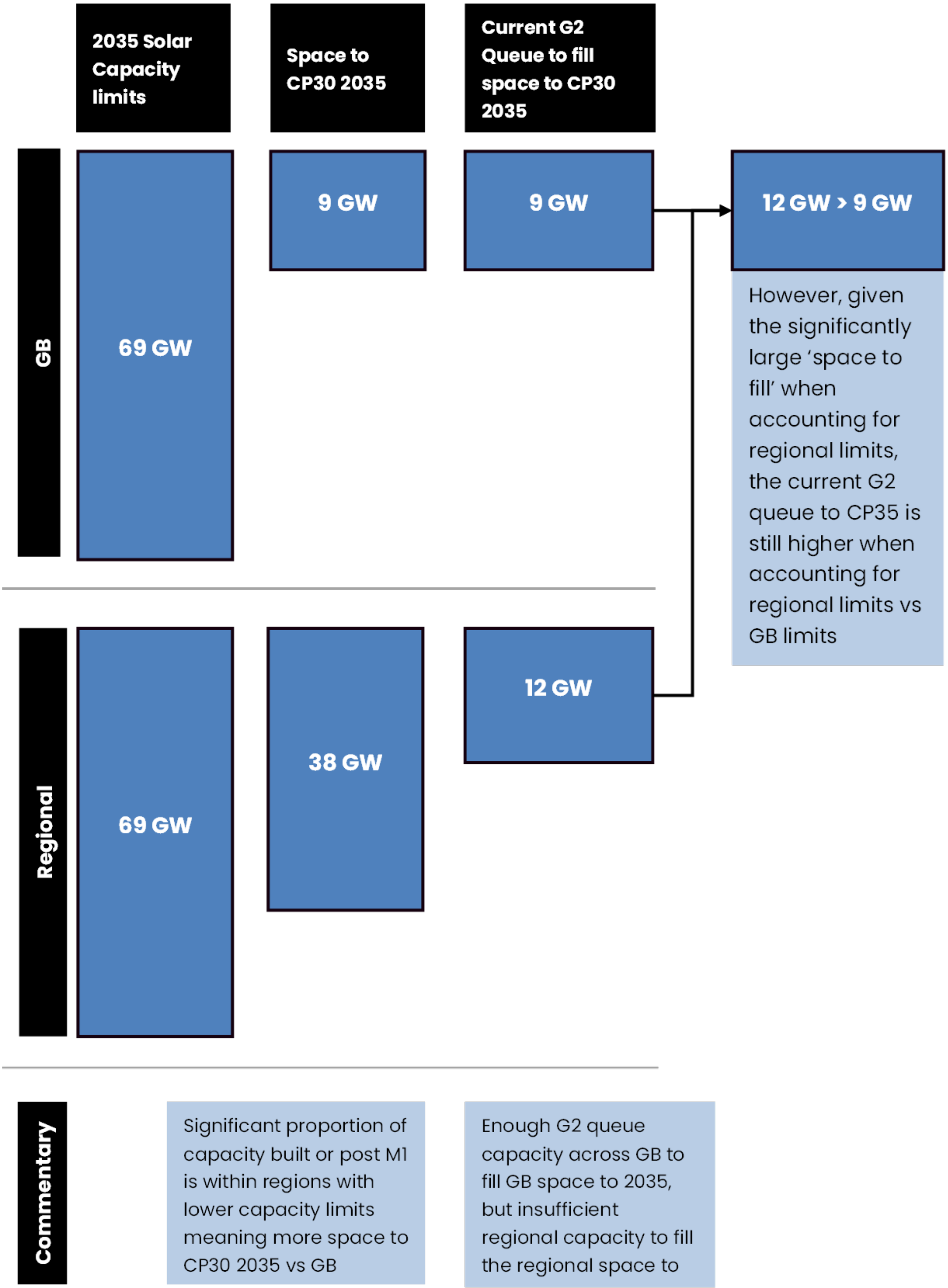

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Figure 7 provides a comparison of the expected change in solar capacity between a national and regional case, from a base case perspective. From a GB perspective, the 2035 solar capacity limit is 69GW. The space to CP30 2035 is 9GW. The current Gate 2 Queue to fill space to CP30 2035 is 9GW. From a regional perspective, the 2035 solar capacity limit is 69GW. The space to CP30 2035 is 38GW. The current Gate 2 Queue to fill space to CP30 2035 is 12GW. The figure finds that the current Gate 2 queue to CP35 is still higher when accounting for regional limits compared to national limits. The figure also contains two commentary boxes. One notes a significant proportion of capacity built is in regions with lower capacity limits, resulting in more available space in GB than in regional areas. One notes there is enough Gate 2 queue capacity across GB to fill GB space to 2035, but not enough within individual regions.

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Figure 8 – Solar example capacity change between national and regional (high case)

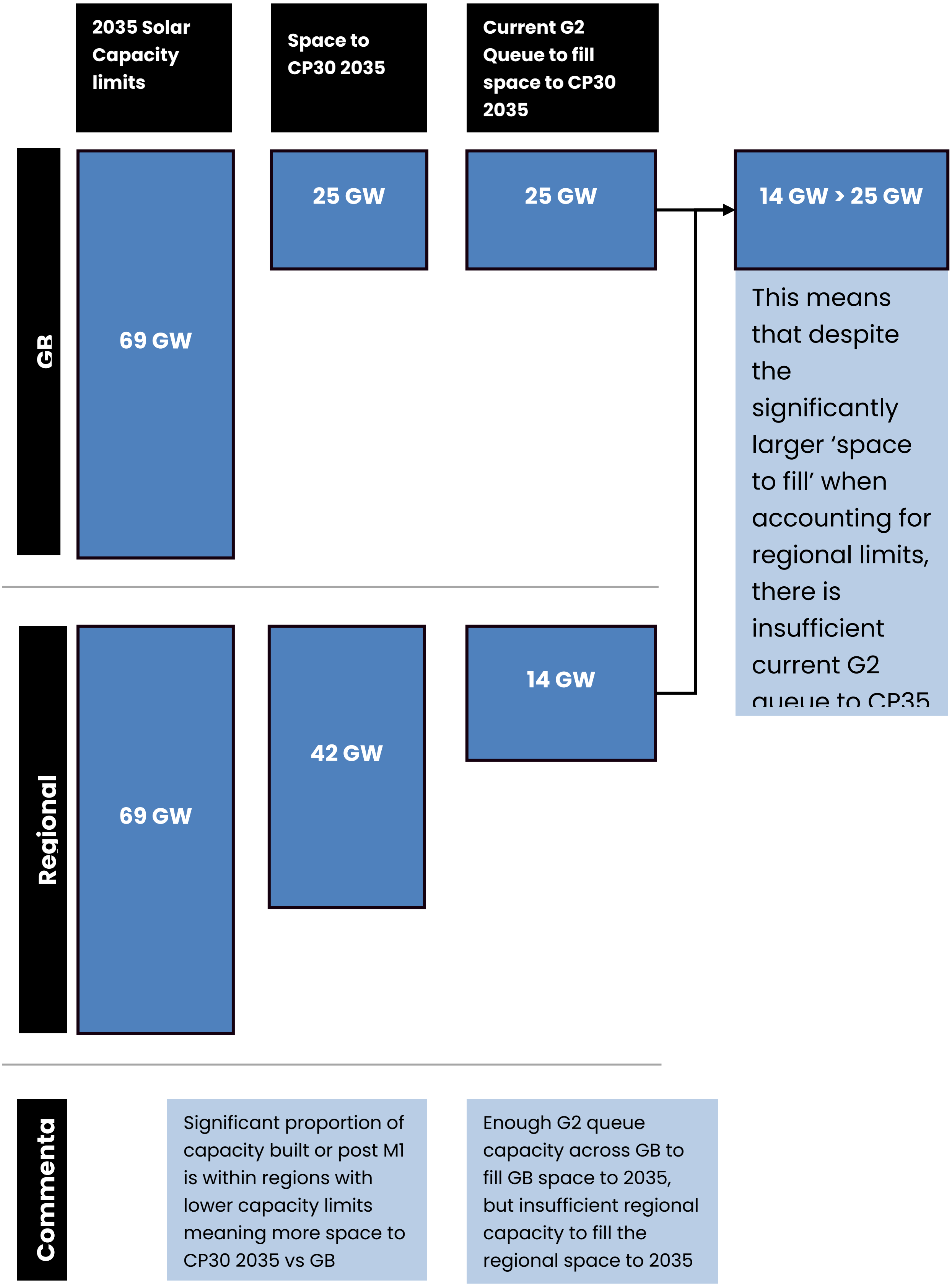

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Figure 8 provides a comparison of the expected change in solar capacity between a national and regional case, from a high case perspective. From a GB perspective, the 2035 solar capacity limit is 69GW. The space to CP30 2035 is 25GW. The current Gate 2 Queue to fill space to CP30 2035 is 25GW. From a regional perspective, the 2035 solar capacity limit is 69GW. The space to CP30 2035 is 42GW. The current Gate 2 Queue to fill space to CP30 2035 is 14GW.The figure finds that as the capacity in the regional queue is lower, there is more allocation to fill but a lack of queued capacity compared to a national level. The figure also contains two commentary boxes. One notes a significant proportion of capacity built is in regions with lower capacity limits, resulting in more CP30 2035 space compared to a national level. One notes there is enough Gate 2 queue capacity across GB to fill GB space to 2035, but not enough capacity to fill the regional space to 2035.

Context, approach and assumptions

2.73 The activation analysis that modelled the expected queue in scope of the PCF and the distribution of M1 dates needs to be used against a range of average project attrition rates. NESO uses these rates as a proxy for queue health, because project terminations influence the amount of capacity planned to be built, also indicating the capacity that needs to be built to meet Clean Power 2030. Therefore, using average attrition rates alongside the expected queue in scope of the PCF is necessary to test the value of the activation threshold. This will ensure that the activation threshold can be met quickly enough if the queue is unhealthy but it will not be met if the queue is healthy over the measurement period of the activation metric.

2.74 For the purpose of this analysis, NESO defines attrition as the termination of projects in the Gate 2 connections queue failing to meet queue management milestone 1 (M1).

2.75 To avoid making assumptions regarding probable attrition rates in the Gate 2 connections queue, NESO has calculated average attrition rates that are necessary to meet the activation threshold from the 1st semester of 2026 (H126) until the necessary time period that would lead to 6.5GW of cumulative attrition (that is, meeting the activation threshold). This method allows NESO to estimate average attrition rates for the activation metric in any given six-month period that would contribute to the cumulative activation metric based on project terminations.[27]

2.76 Ofgem considers this approach reasonable because we recognise that calculating attrition rates for an expected Gate 2 queue is a complex exercise requiring to take many complex assumptions, that are disproportionate for the purpose of assessing the quality of the PCF activation threshold. We have also considered the possibility to use historical attrition rates, but we do not believe these will be fit for purpose to model future attrition. This is because historical attrition rates and their underlying assumptions were established for the previous connection process, which did not

[27] Terminations following failure to meet M1

contemplate a gated process and the requirement to meet readiness and strategic alignment criteria (ie CP2030 and future strategic planning tools including the SSEP)[28].

2.77 The data source used in this analysis is the data book of the Connections reform data Impact Assessment (as of December 2024), filtered for allowed capacity for each technology type in 2035 as set out in CP2030, project maturity and connection dates.

National activation threshold results

2.78 Using the results of the national (GB) activation analysis, NESO has calculated that to meet the 6.5 GW activation threshold at the earliest opportunity, project attrition needs to be 33% or above. If the attrition rate is below 6% instead, no PCF activation will be required during the initial measurement period, hence indicating a "healthy queue". If attrition rates are between 6% and 33%, the activation threshold could be met depending on the percentage of attrition associated in each year. A breakdown of the calculated attrition rates over the PCF measurement period for the national analysis are shown in shown in table 23.

Table 23 – Required Average Attrition rates (national view)

Period When PCF is Activated	Estimated Average Attrition Rate to Activate 6.5GW Threshold	Estimated Average Attrition Rate to Activate 6.5GW Threshold
	Base Case Gate 2 Queue	**High Case Gate 2 Queue**
1H26	33%	35%
2H26	26%	27%
1H27	18%	15%
2H27	10%	8%
1H28	10%	8%
2H28	10%	8%
1H29	9%	7%
2H29	8%	6%
1H30	8%	6%
2H30	8%	6%

[28] The Strategic Spatial Energy Plan (SSEP) is a comprehensive plan to identify specific locations in GB for future energy infrastructure that will ensure strategic alignment with national energy needs

Regional activation threshold results

2.79 Considering the regional activation analysis, NESO has calculated that to meet the 6.5GW activation threshold at the earliest opportunity, project attrition needs to be 32% or above. If the attrition rate is below 5% instead, no PCF activation will be required during the initial measurement period, hence indicating a "healthy queue". A breakdown of the calculated attrition rates over the PCF measurement period for the regional analysis are shown in table 24.

Table 24 – Required Average Attrition rates (regional view)

Period When PCF is Activated	Estimated Average Attrition Rate to Activate 6.5GW Threshold	Estimated Average Attrition Rate to Activate 6.5GW Threshold
	Base Case Gate 2 Queue	**High Case Gate 2 Queue**
1H26	34%	32%
2H26	27%	26%
1H27	17%	16%
2H27	8%	7%
1H28	8%	7%
2H28	7%	7%
1H29	7%	7%
2H29	6%	5%
1H30	6%	5%
2H30	6%	5%

Final considerations

2.80 Based on the results of the activation analysis, Ofgem anticipates that a cumulative figure of 6.5GW can be met quickly enough (within six months) if there is an unhealthy queue (ie 32% or above of projects are terminated due to failure to meet M1) and that the PCF will not be activated if project attrition is equal or below 5%.

2.81 NESO acknowledges that the estimated activation scenarios for the PCF are likely to be conservative, as the remaining space in the gate 2 connections queue to 2035 (as per CP2030) is likely to be overestimated. This is because the estimated capacity in scope (when considering regional limits) is higher than what it can be anticipated in practice, since NESO's analysis did not consider zonal substitutions and project protections and rebalancing because of the complexity involved.

2.82 Zonal substitutions are an attempt that NESO will perform in case there is undersupply caused by zonal imbalance against the Clean Power 2030 action plan. This means that in case of undersupply, NESO will determine if the issue will be resolved by adjusting the capacity allocated to the same technology in adjacent zones.[29]

2.83 NESO will not remove 'protected' projects[30] even if the regional capacity limits is exceeded and will re-balance zonal capacities to account for those projects to maintain alignment with GB-wide total permitted capacities.[31]

2.84 Ofgem acknowledges that the regional capacity in scope of the PCF can be overestimated and therefore attrition rates to test the activation threshold can be underestimated. However, we are satisfied that the analysis uses best available data. Furthermore, the PCF activation governance as proposed in both Original Proposal and all WACMs of CMP448 grants NESO and the Authority a discretionary power to whether activate the PCF or not after the activation threshold has been met. We anticipate that this design will allow NESO and the Authority to take opportune decisions around the PCF activation that consider the data available at the time and wider factors, including investment and market conditions. The activation analysis that considered attrition showed that in the early years of the new queue formation a high percentage of attrition would be required to meet the activation threshold. We anticipate that such a scenario would have a negative impact on the system requiring developers to assess project viability. This is because the connections pipeline would be at risk of delivering CP2030, hence the queue would be in "poor health". This could potentially result also in an inefficient network infrastructure if network companies have started enforcement works to accommodate connections that would not connect. That being said, we consider this scenario to be unlikely, especially because a proportion of projects connecting in 2026 should be already in the final stages of project development or close to energisation (hence more committed and viable), and unlikely to exit the connections queue. The lower percentages of attrition rates needed to materialise during the final stages of the first PCF metric period (ie 2028-2030) would also have an impact on developers. This is because the connection pipeline at that stage would be in the "critical path" to deliver CP2030 and the projects connecting by 2030 would need to ensure they are sufficiently viable. In such a scenario, a lower percentage of attrition rates (ie 5%-8%) may indicate that the PCF could be activated and projects would be more incentivised to regularly assess their viability closer to the CP2030 target.

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[29] This mechanism is established in the Connections Network Design Methodology (CNDM), under section 5

[30] The categories of projects protections are established in the Gate 2 Criteria Methodology, under section 6.2

[31] This mechanism is established in the Connections Network Design Methodology (CNDM), under section 5.14

Impact on Consumers

2.85 NESO has assessed the impacts of the PCF on consumers qualitatively, considering the benefits that the PCF activation will have on developers in the form of benefits of DEVEX of projects outweighing PCF financing costs.

2.86 Furthermore, NESO has also assessed other costs and benefits of the PCF considering project developer behaviour and three different scenarios.

Consumer impacts considering PCF financing costs and DEVEX financing benefits

2.87 NESO prepared an analysis on the likelihood of consumer benefit from the PCF which has been discussed during the workgroup stage of the proposal. This analysis considers aggregate costs and benefits to the consumer based on the additional generation capacity required until 2035 to meet CP2030 targets.

2.88 The analysis of consumers benefits of DEVEX of projects and PCF financing costs focuses on a subset of the potential costs and benefits to consumers, namely the direct impact of PCF activation on developer costs (and savings) that could pass through to consumers.

2.89 The assumption underpinning this analysis is that to see net benefits for consumers, the benefits of DEVEX of projects following the PCF activation must outweigh PCF financing costs.

2.90 The PCF financing costs are derived from the application of the PCF financing rate to the value of the PCF until a project passes M1. Compound interest payments on PCF financing costs until connection are also considered.

2.91 The DEVEX financing benefits are derived from projects spending less time in the queue on average. The PCF is expected to drive earlier connection dates on average relative to an unhealthy queue. This enables projects to spend less time in the queue on average and therefore reduces the total DEVEX financing costs on average and this is seen as a benefit.

2.92 The extent to which DEVEX financing costs would be reduced is driven by two factors:

- The average proportion of DEVEX that can be spent closer to connection.
- The average duration of time that a proportion of DEVEX can be brought closer to connection.

2.93 The PCF financing costs consider that in a sufficiently unhealthy queue, the PCF will be activated. The cost of the PCF to viable projects is financing the PCF security which is required until passing M1. This cost includes compound interest payments on PCF financing costs until connection.

2.94 Therefore, it is conceivable to see a benefit for consumers if the PCF financing costs are less than DEVEX financing savings on average across the queue.

Other potential costs and benefits

2.95 Building upon the preceding analysis, NESO has also conducted a qualitative evaluation of the PCF's anticipated impact on consumers. The primary assumption underpinning the analysis centres around the findings that the benefits of introducing the PCF to the CUSC, will bring a neutral or net benefit to consumers which likely outweighs the cost.

2.96 To develop the additional qualitative analysis impacting consumers NESO has considered a subset of costs and benefits to be evaluated against the following scenarios: 1) no PCF activation, 2) post PCF activation, 3) a scenario where the threshold is met but the "health of the queue" is uncertain. Costs include: the cost of financing the PCF and developer cost of capital, administrative burden on developers and network operators. Benefits include: developer and network operator savings, CO2 reductions and increased economic output.

2.97 The analysis shows that there is to be minimal impact on consumers, in a scenario where the PCF had not been activated. The change that the PCF would bring to the established practices of developer behaviour within the connections queue, is found to bring the most benefit to consumers. Specifically, with the PCF in place, projects of a low quality that may not succeed in their planning application process may be incentivised to not join the Gate 2 queue. Moreover, projects that become less viable after entering the Gate 2 may self-terminate prior to achieve M1. Both scenarios may lead to viable projects progressing at an accelerated pace, leading to a connections process operating at an increased level of efficiency bringing consumer benefit. This is because projects remaining in the queue would spend less time in the queue potentially reducing their overall project costs.

2.98 Furthermore, a "healthier queue" would improve the efficiency of the connections process facilitating also network operating savings that would be passed onto consumers. By the PCF being activated in a queue where project developer wait times are long and ready projects not being prioritised, the cost and benefits of the PCF to consumers anticipated by NESO are found to be significant.

2.99 Receiving an earlier connection date, may lead to lower DEVEX costs. If the savings relating to reduced project financing in the analysis of aggregate costs and benefits to the consumer discussed in the section above are realised, these could equate to lower electricity prices for consumers.

2.100 Consumers may also be positively impacted by network operator savings - through operators incurring less costs to process connections applications and design them, improving the efficiency of resources and network capacity allocation in general and working with an increased degree of planning certainty. Consumer net welfare may also improve, with an efficient connections queue accelerating the displacement of fossil fuels leading to a reduction in CO_2 emissions.

2.101 The analysis acknowledges the cost of financing, securitising against the PCF and developers managing an increased investment risk. However, these risks and increased costs are found to more likely impact a subset group of developers with less viable projects. The activation mechanism, involving the Authority's veto power and corresponding statutory duties, is found to provide an additional layer of protection for consumers by ensuring they are not unfairly impacted by any unintended costs from an activation decision and ensures the PCF is only activated when it will bring consumer benefit.

2.102 WACM1 and WACM2 are also analysed in terms of perceived consumer benefit. Consistent with the Original Proposal analysis, it is found that there is to be minimal impact on consumers, in a scenario where the PCF had not been activated.

2.103 In an unhealthy queue scenario where the PCF is activated, both WACMs are expected to deliver fewer benefits than the Original Proposal. The value of the PCF holds the capacity to influence queue behaviour by incentivising unviable projects to exit the connections queue. Given both WACMs look to reduce the overall cost of the PCF, NESO considers both WACMs would hold a lesser influence over impacting the choice to exit and overall "queue health". Whilst developer costs are reduced, consumer benefits are negatively impacted as the discount reduces the behavioural incentive that is required to enhance queue health.

2.104 Given the above analysis, NESO find that the Original Proposal is likely to provide better consumer outcomes than WACM1 and WACM2. The enhanced level of queue health that the Original Proposal facilitates, will result in lower costs for consumers.

2.105 Ofgem has considered this additional analysis and have concluded that overall, it is likely that consumers would benefit from the CMP448 Original Proposal for two main reasons. First, the Original Proposal would ensure a more efficient connections queue made of more committed projects, providing a stronger incentive when compared to the status quo and both WACMs. The main benefits we anticipate for consumers are related to a better network build signal for network operators leading to a more efficient use of network capacity allocation and faster connections which would reduce overall network infrastructure costs. Secondly, the fact that the PCF activation is subject to Ofgem approval would ensure that Ofgem evaluation considers all the evidence and data available at the time to make a decision that protects consumers interests in the most optimal way.

3. Uncertainty and associated risks

Uncertainty associated with developers

3.1 In the context of developers, there are several uncertainties surrounding how the PCF may impact competition, investor confidence and project financing. If the value of the PCF is set too high, it could discourage queue applications, increase self-terminations and lead to a less diverse connections pipeline. Overestimating the PCF or overestimating the queue in scope for the PCF may also reduce the benefit of the PCF to improve the efficiency of the reformed connections queue, whilst an underestimation of attrition rates could create uncertainties surrounding investor confidence and an increased administrative burden for developers.

Impact on Competition and increase of project self-termination

3.2 We assume that most developers will finance the cost of the PCF by debt. This means that to cover the cost of the PCF developers will increase their debt and would pay an interest on that debt for as long as they are liable to pay or securitise the PCF. We consider that the PCF value may have an impact on competition in the generation of electricity if the value is too high to cause a barrier to entry or stay in the connections queue for specific projects. We have considered the impact on small and large developers with regard to the value of the PCF and have concluded that there could be a minimal impact on competition for small developers and large developers, although it is not quantifiable based on the data available. We have discussed extensively with NESO to evaluate the possibility to use better data and assumptions, however, given the lack of available data we have concluded that additional evidence will not be needed.

3.3 Large developers (typically offshore wind farms) would likely be exposed to the PCF for a longer period if activated. This is because these types of projects tend to be more complex and have a longer lead time. However, we consider that large developers with better access to finance and low financing rates will develop these projects. Therefore, we anticipate that there would be a minimal impact on competition for larger projects.

3.4 Evaluating the impact on small developers can be considered by assessing the size of the project, the developer's revenue and access to finance. The impact on competition would change, depending on what is the focus of the assessment (ie project size or access to finance and revenue). A small project size (ie 1 MW) could in theory afford the maximum PCF value of £10,000/MW on top of its developer expenditure. Conversely, a developer that has small revenues usually has access to limited or less favourable finance. Therefore, if its project has an average technology size an additional PCF liability can conceivably make the project less viable. We do not have data related to the profitability of each project in the connections queue and because the CMP448 proposal targets projects viability, we have concluded that the proposal does not discriminate against the size of the project but tests its viability. Therefore, small developers that have viable projects do not face a barrier and there would be a minimal impact on competition for smaller projects.

3.5 We also consider that the financial burden incurred by developers in financing and securitising the cost of the PCF, may adversely affect investor confidence given the increased financial risk. In turn, a lack of investor confidence may impact competition if projects are hesitant to proceed with entering the Gate 2 queue leading to a smaller overall connections pipeline. As stipulated, under the Original Proposal, the PCF will be subject to increases of £2,500/MW every six months, and this will be capped at£10,000/MW. The scheduled increases and cap will provide developers with a reassurance surrounding the financial obligations expected through the PCF and help manage any uncertainties relating to investor confidence. Therefore, we anticipate any concerns surrounding investor confidence negatively impacting overall competition are mitigated by the financial predictability of the PCF design.

3.6 Both WACMs introduce a PCF and with positive effects on competition over the status quo. However, under both alternatives the PCF value and its liability upon project termination is lower than the Original Proposal. As a result, the reduced burden of the PCF may discourage projects from regularly reassessing their viability, leading to an increased number of projects in the queue that are unlikely to reach completion. In turn, there is a risk these projects undermine the level of competition in the overall queue. We anticipate that the risk on competition is more prevalent through the implementation of the WACMs compared to the Original Proposal.

3.7 We acknowledge the financial burden introduced by the PCF, has the potential to facilitate an initial increase in project self-terminations. As project viability is regularly assessed, projects may deem the PCF unaffordable and choose to exit the queue. In turn, this may lead to a degree of instability within the progression of connections if replacement projects are regularly being sought. However, the scheduled viability assessment that the PCF implements is required to improve the status quo and facilitate the objectives of the TMO4+ reform package. In addition, the authority deems that an initial increase in project self-terminations under the Original Proposal as a strong indication that the queue has become saturated with projects that will not ultimately connect and that the PCF is working as intended. On this basis, we anticipate any concerns surrounding queue instability brought about by an increase in project self-terminations under the Original Proposal are mitigated.

3.8 Under both WACMs, we believe there is arguably a greater risk of self-termination being encouraged at the latest possible date and not being actioned in good faith given the reduced value and discount of the PCF. An increase in project self-terminations under either WACMs do not provide the same degree of reassurance relating to queue health as facilitated by the Original Proposal. For this reason, we anticipate the risks relating to delayed project self-terminations are more prevalent through the WACMs.

Impact Assessment

Overestimation of the PCF value

3.9 We acknowledge that NESO's assumptions related to calculate the PCF could result in an overestimation of the PCF Value, however we recognise that calculating a bespoke PCF for each project is impractical and therefore the proposed approach to establish a single PCF value for all projects in the queue is reasonable. That being said, Ofgem is cognisant that the calculated value of the PCF will inherently be "overestimated" or "underestimated" relative to any given project, depending on how the project's financial position compares to the assumptions to set the value of the "real option".

3.10 Ofgem notes that the methodology provided by NESO to estimate the PCF value based on the "real option" analysis did not consider impacts on Contracts for Difference (CfD).[32] In this regard we have considered that if developers see the introduction of the PCF as introducing a risk of high costs, they could factor this risk into CfD bids, potentially resulting in higher CfD strike prices. Ofgem and NESO do not have information about the profitability of each project in the queue to assess this risk and after engagement with NESO we have concluded that such assumptions would be hard to make in the absence of reliable data. That being said, we have concluded that the impact of such risk would be minimal. This is because projects willing to connect are already subject to pay securities to demonstrate their commitment towards energisation. Additionally, the PCF financing cost as a percentage of DEVEX should not add a disproportionate burden on project viability and the PCF security will be returned after the project has met M1.

Overestimation of the expected queue in scope of the PCF and underestimation of attrition rates

3.11 At the time of writing, Gate 2 offers have not yet been issued by NESO therefore the Authority is unable to determine the exact Gate 2 queue size. It has been confirmed by NESO that capacity in the Gate 2 queue will be allocated on a regional and technology-specific bases to meet the requirements set out in CP2030, for required capacity up to 2035. To estimate the expected queue in scope of the PCF, NESO have confirmed they have made several high-level assumptions to gauge the composition of the future Gate2 queue; allowed capacity for each technology type as set out in CP2030, project maturity and connection date.

3.12 If an overestimation of the expected queue in scope of the PCF occurs, there is a risk CMP448 has an overall reduced impact on TMO4+. The purpose of the PCF is to encourage regular assessment of project viability and with a lesser than expected number of projects liable, a lesser number may regularly carry out the required self-

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[32] CfD is a policy that supports investment in low carbon energy in GB. The CfD mechanism allows generators to receive a pre agreed strike price based on a competitive tender process, to reduce their exposure to lower electricity prices. As the wholesale price of electricity fluctuates, the generator is either paid a subsidy up to the strike price, or pays back any surplus above the strike price to the scheme, so that generators have the certainty of always receiving the value of the strike price. The cost, or benefit, is passed on to consumers through their bills

assessment. In turn, this could lead to an increased number of projects in the queue that are unlikely to eventually connect. This risk is partially mitigated by the existence of existing queue management milestones. However, these measures are not designed to incentivise a proactive assessment of a project's own viability and currently there is no financial incentive that ensures this behaviour in a timely manner. For this reason, we accept an overestimation of the expected queue in scope of the PCF presents a risk to limiting queue congestion. Regarding this risk of overestimation, in relation to the WACMs, we find the above risk equal for the alternative options considered.

3.13 A similar overestimation also presents the risk that certain developers may claim they are being unfairly financially disadvantaged by having to post security against the PCF, if a large proportion of other projects in the queue are not subject to the same additional financial obligation. The purpose of the security is to act as a safeguard from projects taking up queue allocation but who have no realistic prospect or intention of progressing. Whilst the Authority acknowledges that placing certain projects at a financial disadvantage compared to others does not contribute to a fair connections queue, the PCF security will be returned by NESO after the project has met M1. If the security was not to be returned under the Original Proposal or WACMs, the Authority accepts this would represent a plausible risk to the cost developers undertake when entering the queue.

3.14 Considering attrition rates pertinent to this analysis, the Authority acknowledges that whilst some levels of attrition are expected and required to meet the 6.5GW activation threshold at the earliest opportunity, an underestimation of attrition rates can present several uncertainties. If attrition rates are indeed underestimated and a higher number of projects exit the queue than predicted, this may lead to a less diverse connections queue and an overall smaller connections pipeline. Consequently, this could hinder progress toward achieving the CP2030 goals. The authority accepts this risk but is of the view that the governance mechanism of the PCF would act as an appropriate safeguard to consider optimal course of actions that promote a diverse energy mix and the achievement of CP2030 targets.

3.15 If attrition rates were to increase unexpectedly, investors may view the connections process as too high-risk and the financial pressures of the PCF as unmanageable. We believe this risk is managed by the Original Proposal being designed around a cumulative metric value allows NESO to target a total "allowable" threshold, which can consider in-year variation and cumulative impacts of attrition over time. Investors can be provided with a reassurance that the authority would monitor and respond to any adverse impacts of attrition. Moreover, we recognise the risk of an increased administrative burden that becomes prevalent alongside a higher than-expected number of projects exiting the queue and where replacement projects must be sought. However, when seeking replacement projects, the authority considers much of this administrative burden associated with selecting the most appropriate replacement candidate falls to NESO as opposed to the developer.

3.16 Based on the above analysis, the authority believes the risks are equal for all options considered.

Uncertainty associated with consumers

3.17 From a consumer perspective, the authority is unable to quantify a level of net consumer benefit the implementation of CMP448 will bring. Whilst the status quo is likely to result in increased consumer costs, overestimating both the value and impact of the PCF could allow unviable projects to remain in the queue for an extended period and ultimately contribute to increased network costs that could fall to consumers.

3.18 A primary aim of the connections reform process is to better facilitate the delivery of connections that contribute to the achievement of CP2030 targets and that bring overall benefit to consumers. However, certain data limitations bring a degree of ambiguity to the authority's assessment of evaluating overall consumer risk.

3.19 In electing to remain with the status quo, unviable projects are more likely to stay in the connections queue which will in turn contribute to an environment where the Gate 2 queue is not progressing efficiently. When this occurs, traditionally consumers experience higher costs which is inconsistent with the overall strategic aims of TMO4+. Given the risk posed by the status quo, and in a landscape where many consumers are already facing difficulty with energy costs, the Authority believes it is necessary proceed with CMP448. Although there is ambiguity surrounding the exact financial net benefit on consumers, the Original Proposal represents an improvement from non-intervention which helps mitigates the current risk consumers face.

3.20 In concluding that the PCF could create net benefit for consumers, NESO considered that DEVEX financing benefits due to PCF activation had to outweigh PCF financing costs. However, concerns were raised by the Workgroup that not all costs associated with the PCF had been considered. For example, uncertainty surrounding risk adjusted views from developers on hurdle rates. NESO are of the view that the benefits of introducing the PCF to the CUSC, will bring a neutral or net benefit to consumers which likely outweighs the cost. Whilst we acknowledge both the quantitative and qualitative analysis completed by NESO, the authority is unable to guarantee or determine the exact monetary impact CMP448 will have on consumers.

3.21 We acknowledge the risk that if the value and impact of the PCF have been overestimated, any net financial benefit may not reach the consumer. If the intended impact of the PCF is not realised, unviable projects may remain in the queue leading to an inefficient use of grid capacity. This may lead to increased system costs, passed down through network charges that would ultimately reach consumers. We also acknowledge the risk that the increased initial administrative burden created for network operators, through the securitising process, could lead to increased consumer costs. However, the authority acknowledges their duty to intervene when there is a disproportionate impact on consumers and believes the governance mechanism of the PCF would act as an appropriate safeguard. Thereby, we believe these risks are mitigated.

3.22 Regarding both WACMs, there is a risk that consumer net benefit would be less when compared with the Original Proposal, given both alternatives reduce the behavioural incentive that is required to enhance queue health. When considering the WACMs, the authority is of the view that similar ambiguity exists when considering the exact net consumer benefit.

3.23 Based on the above, the risks and uncertainties relating to consumer impact are equal for all options considered.

4. Monitoring and Evaluation

4.1 As defined by the Impact Assessment, the main policy objectives of the PCF are to incentivise a regular self-assessment of project viability that encourages a timely progression of projects, remove projects from the queue that will ultimately not connect and support CP2030 goals.

4.2 The analysis presented by NESO allows the Authority to evaluate the potential impacts of the proposal, indicating that the Original Proposal of CMP448 would complement the efficiency of TMO4+ ensuring a better network build signal by encouraging a culture of viability self-assessment. The analysis examined the PCF value and the cost of financing the PCF on developers, whilst considering four project archetypes. The analysis also evaluated the percentage of the connections queue that may be impacted by the proposal and considered whether the proposed activation threshold was sufficient to incentivise a regular assessment of project viability.

4.3 As outlined in the previous section, there are a collection of risks and uncertainties associated with the proposal that would require monitoring should the Original Proposal of CMP448 be implemented. This section sets out our plan to monitor and evaluate any decision to approve the proposal in the case the PCF is activated, including our expectations for future reviews.

Assumptions

4.4 In a situation where the PCF has not yet been activated, the authority can assess the operational costs incurred by NESO as well as the effectiveness of TMO4+ and User Progression Milestones. NESO estimates that the cost of monitoring the activation metric is small when compared to the cost of developing the proposal. This is because NESO already logs data related to queue management milestones terminations. Should the proposal be approved, only a small proportion of full-time equivalent units would be necessary to collect the required information and publish it on the NESO website. Furthermore, NESO estimates that once the system for the solution has been developed and implemented, it is expected that the enduring costs and effort of administrating the solution to be low if the PCF is not activated.

Evaluation Methodology

4.5 The Authority is only able to monitor the risks, uncertainties and unintended consequences outlined in section three, in a situation where the PCF has been activated. This is due to the uncertainties outlined not materialising in a circumstance of non-activation and being transparent about the inevitable limitations in the current data available. In deploying our evaluation methodology, the Authority recognises its responsibility to closely monitor for any unintended consequences that result from the activation of the PCF.

4.6 We believe an evaluation assessment comprised of an evidence assessment and a post implementation review is best suited to test how well policy objectives have been met and to what extent any unintended consequences that have come to fruition have been managed.

Evaluation Questions

4.7 The above leads to several evaluation questions:

1. What are the costs of the PCF once activated, compared to the costs in a scenario where the PCF has not been activated?
2. To what extent has the policy met its objectives and what metrics should be considered?
3. What is the impact on competition, specifically for small developers?
4. What are the causes of attrition rates?
5. Is it true network planning is better facilitated through the activation of the PCF?

Causal Chains

4.8 Considering TMO4+, the reformed connections process does not require projects in the queue to regularly reassess their viability and the existing queue milestones, in the view of the Authority, do not provide a sufficient check and balance on the duty of a project to proactively self-assess their viability.

4.9 The policy objective behind CMP448 is to encourage a project to regularly assess their viability. If this policy objective is met, the removal of projects which receive a Gate 2 offer but are unlikely to connect will be facilitated.

4.10 As a result, grid capacity will be made available for more viable projects, the allocation of network planning resources will be more efficient, and the connection of net zero projects will be accelerated.

Impact Assessment

4.11 The Authority accepts there are several consequences that may impact the policy objectives including:

- Higher than expected project attrition rates.
- Overestimation of PCF value of queue in scope.
- An adverse impact on competition, for developers of a certain size.
- An increase in project self-termination rates.

Monitoring: Evidence Collection

4.12 As discussed, should the PCF be activated, we believe only at this stage is the Authority able to monitor the ongoing effectiveness of any activation. Once the PCF is activated, 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, and other relevant governance established). The Authority will discuss with NESO and understand what best evidence is available at the time of activation to allow a sufficient response to be given to our evaluation questions.

4.13 The exact methods of evidence collection have not been confirmed by NESO at the time of writing, but several examples have been provided. The Authority deems the following evidence (including but not limited to) would likely be requested for consideration:

- Project attrition rates (pre and post M1).
- The size and types of projects choosing to terminate, as well as the size and types of projects choosing to remain in the queue.
- The timelines to secure replacements for terminated projects. A review of projects progressing at the rate required to achieve CP2030 goals.

4.14 If any changes to the PCF were required as a result of the evidence review or evaluation responses, a separate CUSC modification would be required. In addition, given the Authority's power provided through the activation governance mechanism we are confident there is sufficient flexibility to course-correct if and as required to maximise the impact of the PCF in achieving the intended objectives and mitigate any unexpected consequences.

Timing of Evaluation

4.15 Based on the above, we feel it is appropriate to conduct an evaluation in five years, given this matches the timeframe of the first PCF activation period.

Appendices

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Appendix 1 – "Real Option" analysis

Concept and assumptions

The "real option" analysis

1.1. The "real option" analysis is a common financial evaluation methodology to assess strategic decision-making in an uncertain business environment. The value of "real options" is calculated using models for financial option pricing, that consider the characteristics of the underlying real asset and the relevant uncertainties. The value of these options is also related to a variable that is subject to change. In this case the variable is the "option to delay" a decision to not progress with the project.

1.2. NESO assumes that a project in the Gate 2 queue prior to M1 could become unviable when it has a negative net present value (NPV), for example a project having forecasted future revenues smaller than the estimated future costs. Given market conditions tend to change, the NPV may become positive in the future, therefore the optimal choice for a project is to stay in the queue even if its NPV is slightly negative for as long as possible, to see if market conditions improve. On that basis, NESO assumes that although a project could presently be unviable, given its financial situation can change, developers would still have an opportunity to decide in the future to continue its development or stop. In NESO's view, this opportunity is the "real option" and its value is £2,218.65/MW. The PCF is then set at a higher value (£2,500/MW) than the "real option" to incentivise the intended behaviour.

1.3. Despite the PCF being intended to influence developers to regularly reassess their projects' prospects and (where unable to connect) decide to leave the queue early, it is hard to quantify the exact value for each project that would incentivise to leave the queue when the developer is pessimistic that the project will eventually connect, and if and when projects will take such a decision. Nonetheless, we anticipate that if a significantly large proportion of projects in the Gate 2 connections queue have an overestimated PCF, the incentive to leave the queue will be stronger for more projects. This would result in unviable projects leaving the queue sooner but could also cause the unintended consequence that some otherwise viable projects may exit the queue (ie those that have an NPV that is slightly positive). Conversely, if a significantly large proportion of projects in the Gate 2 connections queue have an underestimated PCF, the incentive to leave the queue will be weaker for more projects. This will have a lower impact to otherwise viable projects and unviable projects would likely leave the queue later (ie due to a later decision to voluntarily leave the queue or as a result of a milestone termination). If this was the case for a significant proportion of projects, the PCF would not solve the issue that it aims to address.

Impact Assessment

1.4. That being said, we consider the choice to use the "real option" analysis is a sensible approach to choose a PCF value, which provides sufficient financial incentive to assess project viability. This is because it is highly likely that developers perform financial analyses of future profitability to assess their viability. An additional liability that considers what projects can afford to pay until their project becomes unviable would ensure that the value of the additional financial liability is not too low (so that projects continue to remain in the queue even if less viable) or too high (avoiding that the additional financial liability per se makes the project unviable).

Methodology Assumptions

1.5. To calculate the "real option", NESO uses the following assumptions, noting that all the parameters should be considered "in the round":[33]

1) The NPV of all post-commissioning cashflows is 98% of the NPV of all remaining pre-commissioning DEVEX and CAPEX costs. The project NPV is therefore negative by 2% of the NPV of the remaining pre-commissioning costs.

2) The NPV of all remaining pre-commissioning DEVEX and CAPEX costs is £500,000 per MW of capacity.

3) The decision to exercise the option (to continue the project or to stop) will be taken in six months (represented by the six-monthly incremental profile of the PCF value).

4) Over these six months, the project NPV may change due to an increase in forecast revenues or a decrease in estimated costs. This change in project NPV is normally distributed with a mean of zero and a standard deviation of 3% of the NPV of all remaining pre-commissioning costs.

5) DEVEX is paused over the coming six months.

6) The project will continue after six months if the project NPV is positive, otherwise it will stop.

1.6. Ofgem considers these reasonable assumptions to calculate the "real option". The following paragraphs provide an evaluation of the assumptions that, in our view, strictly consider project viability.

1.7. Assuming a NPV that is negative by 2% of the remaining pre-commissioning costs means that the projected future cashflows are slightly negative. This assumption can be used as an indicator of project unviability for projects that are currently in the

[33] This means that the choice of each assumption considers the values of the other assumptions

queue. We consider it plausible that projects with a negative NPV of 2% could decide to stop their project only when this percentage increases further and would have already exited the queue if the NPV was more negative. This assumption is therefore aligned with the problem that we identified which is the presence of unviable (although marginally) projects in the queue.

1.8. NESO explains that the value of CAPEX costs of £500,000 per MW is taken from the data of an external consultancy that considered a mid-range value based on solar and battery projects. NESO decided not to use CAPEX costs for offshore and onshore wind projects in its assumption because these values are much higher overall and using them to calculate a “real option” could be detrimental for solar and battery projects (whereas this conservative value does not affect negatively offshore and onshore projects). We deem this approach sensible as it is aimed to be mindful of projects that could be more negatively impacted by a PCF value that is too high, which could make a project unviable even if it has a better or positive NPV (compared to the assumptions in this model). Furthermore, data containing the capital expenditure of each project in the queue is not available to Ofgem and there is no requirement for developers to provide this sensitive information. Therefore, its provision would be voluntary and its accuracy hard to verify. This means that the effort to obtain this data may be disproportionate considering the urgency of the CMP448 proposal and could marginally improve the estimate of this model. For this reason, even if Ofgem recognises the potential limitation of this assumption, we are satisfied that is sensible and based on NESO’s and Ofgem’s best available data.

1.9. We recognise that considering DEVEX pause for six months can be oversimplistic. However, NESO explains that this is a sensible approach that simplifies the calculation of the PCF value and avoid having to estimate an alternative, non-zero value (identified as a project’s unavoidable DEVEX burn rate, which is highly specific to the project). NESO recognises that this assumption will result, on its own, in an overestimation of the PCF value, as any requirement to commit DEVEX to an unviable project is itself an incentive to exit the queue. For this reason, NESO states that it has accounted for this bias in the choice of assuming that the present value of remaining CAPEX and DEVEX costs is £500K.

1.10. Furthermore, NESO’s methodology to calculate the PCF value depends on the assumption that a project will continue if its NPV is positive after six months but will stop if the NPV is negative. The PCF value is then set greater than the “real option”. We agree with NESO’s view that in reality it is unlikely that projects would take such a binary decision, as the decision to progress or not would depend on many factors including risk appetite, their own view of market conditions, the scope for changing the design and specifications of the project, etc. However, it is reasonable to believe that developers will eventually decide to stop their progression if the NPV is negative and a decision to do it after six months is aligned with the six-monthly increase of the PCF profile, therefore simplifying the calculation of the “real option” value.