Unite response to OfGem Curate – Demand Connections Reform consultation

1. Introduction

1.1. This submission is made by Unite, the UK's largest trade union with over one million members across all sectors of the economy, including manufacturing, financial services, transport, food, agriculture, construction, energy, utilities, information technology, service industries, health, local government and the not-for-profit sector. Unite also organises in the community, enabling those who are not in employment to be part of our union.

1.2. Of particular interest to this inquiry Unite represents almost 40,000 Energy and Utilities workers including engineers working to maintain the power distribution network throughout Great Britain and Ireland. Unite also represents around 55,000 members in the Food Drink and Agriculture sector of the union.

1.3. Unite has no financial interest in any of the projects and hence this response is drafted solely with the impacts the proposals will have on workers involved in the connection of the facilities to the grid and with an eye to ensuring that the proposals do not disrupt the need for energy security in the UK.

1.4. Unite would like to ensure that the substantial electrical power and water coolant requirements that these data centres will require can be met, without disruption to the electrical supplies to other customers for power and without causing ecological disruption to water courses.

1.5. As stated in the consultation *"Between November 2024 and June 2025, contracted demand in the connection queue increased from 41 GW to 125 GW. Of this, around 73 GW are data centres"*. Unite believes that like every other request for a grid connection the data centres should not be allowed to jump the queue and potentially disrupt the battle faced by the UK to move away from polluting energy sources to a more sustainable future that is not determined by global events, and the profiteering of energy companies.

1.6. NESO's[1] Curate focus to reduce the number of speculative, non-viable projects from the queue is commendable. What is needed however is more engineering teams able to connect the cables and ensure the distribution of power from where it is generated to where it is needed and end the practice of paying windfarms not to generate electricity in Scotland while at the same paying gas fired power stations to generate electricity down south where the demand for electricity is at its highest.

[1] National Energy System Operator for Great Britain

1.7. Unite also calls for the planning permission process to be speeded up to enable the grid to expand at the pace needed to keep up with demand as a nationally important piece of infrastructure.

1.8. Unite also believes that concentrating generational capacity in one area and then connecting cables to move that power around the UK is inherently wasteful given the losses suffered through electrical transmission over distance. Therefore, Unite calls for any data centre demand to be matched with a subsequent increase in generational capacity within the same geographical area.

1.9. Unite is also concerned about the levels of water extraction required by data centres and where the data centre disposes of the thousands of litres of hot water it will generate. Unite would hope that the data centres are working closely with neighbouring housing developments to help them offset their heating and hot water bills or some other way to exploit this resource as opposed to simply dumping the outflow into water courses were the temperature increase could disrupt and fish spawning/breeding[2]. Every degree of warming increases the pressure on fish stocks and therefore pressure on the food supply chain of multiple species including our fishing industry.

1.10. One of the other ways to see benefits from the creation of so much heat, is its use to capture CO_2 via the warming of the amines that are used to capture the CO_2 from traditional carbon capture towers or from one of Carbon Clean's CycloneCC™ facilities. At least in this way the data centre will be contributing to the battle against climate change rather than contributing to it by releasing large volumes of hot water and draining the net of power at a time when the UK is already a net importer of energy.

1.11. In this response Unite sets out the reasons why it fears that the power demands of a data centre will continue to grow.

1.12. Unite is keen to ensure that only viable data centre projects are given a place in NESO's queue for grid connectivity and that connections are not delayed by yet another zombie project, that is speculating on potential investor interest without any realistic benefit to UK plc.

1.13. Unite firmly believes that because of the data centres enormous drain to the energy network and water resources, that they should pay a premium for their water and energy to cover the cost of supply, or build their own desalination and filtration facilities and their own generation with the excess feeing back into the grid. This is especially true if they were to be allowed to jump the queue. In any event it would be prudent of any data centre to have enough energy storage facilities on site to cover off the potential energy supply shortfalls caused by their addition to grid demands. Following two long dry summers and warnings from the scientific community to allow data centres access to water extraction and mains

[2] Fish and their embryos are far more sensitive to heat during the mating season than at any other time in their life cycle, making warming waters a major threat to population survival see:- https://fishfocus.co.uk/rising-water-temperatures/

supplies is far from ideal when farmers crops are dying in the fields and there is the very real possibility of the UK running out of drinking water for its population.

2. Questions

Data centre commitment fee: mechanism design

Q1. Do you agree with our proposed data centre commitment fee, based on Option 1A? Please provide reasons for your answer.

2.1. Unite agrees that a commitment fee would help remove the wheat from the chaff and remove some of those who are merely speculating.

2.2. The queue for grid connectivity is already sizable, caused in part by the lack of trained staff retained by the grid to maintain it and bring it up to a situation where we have enough generational and storage capacity to supply all of the demands from those willing to utilise the supply network.

2.3. At present Unite is concerned that if the demands for connection to the grid made by data centres are realised that the UK would be even more reliant on imported energy decreasing our energy security. Unite would therefore recommend that grid connectivity is prioritised toward supply and storage over additional requests for supply. Any superfluous requests for grid connections reduce the capacity to deliver other projects, deter investment into new schemes and only serve to reduce capacity to deliver what is required.

2.4. Unite would stress the simplest solution would be to increase the number of trained staff to carry out the work, which would have the added benefit of ending the culture where 16-hour days are the norm.

Q2. Do you agree with our qualitative assessment? Please provide reasons for your answer.

2.5. Unite agrees with the basis of a qualitative assessment but feels that more criteria to include a determination of what the project intends to do with all the heat it has extracted from the data centre, favouring projects that help tackle climate change or community home heating projects over simply dumping gallons of hot water into water courses.

Data centre commitment fee: value and calibration

Q3. Is it reasonable to assess the impact of the fee on a hypothetical data centre IRR for a viable project? If not, what alternative basis for an assessment of the impact of the fee on a viable data centre would be more appropriate?

2.6. Unite feels that assessing a projects viability on its Internal Rate of Return (IRR) discount calculation of its net present value (NPV) cash flows, so they equate to zero

annualised return on investments is a method that only focusses on the financial strength of a project as opposed to the combination of IRR with its value to communities, increased property values and a far more none quotative valuation of economic and social good.

2.7. If for example the data centre is to be located in the centre of the country far from a substantive water supply, the drain on the local resources from its operation may have a negative impact on its neighbours with respect to access to water, especially in drought situations such have been felt in 2025 and 2026 in some areas of the UK.

2.8. Clearly, if the project addressed the issue of water access, by providing a reservoir and assisted communities with say, the diversion of the facilities hot water to assist with community heating, then, wouldn't it have a greater intrinsic value, than one whose aim is centred on the amount that project could realise for its investors?

2.9. Unite might suggest that a better assessment of the value of any new project should be based on additional employment opportunities, lowering the carbon footprint, helping its community out of fuel poverty, in short what the new project could do for its neighbours rather than the investors and big business.

> Q4. Assuming your data centre project will progress to energisation, what would be the impact on your IRR if the data centre commitment fee value is set at 2.5% or 7.5% of the average capital costs per MW? Provide reasons and relevant evidence to support your answer.
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> Q5. Do you agree with the proposed estimate of approximately £9.5 million per MW as the average capital cost of building a data centre? Please provide reasons for your answer.

2.10. Unite has no intention of setting up or operating a data centre and therefore the answers to Q4 and Q5 are "no comment".

> Q6. Do you agree that capital expenditure is a more appropriate basis than development expenditure for calculating the commitment fee? Please provide reasons for your answer.

2.11. Unite feels that capital expenditure is a powerful indicator of the level of commitment to a project, but capital expenditure would include the amounts paid to consultants, individuals to develop proposals, managers to coordinate the development strategy, etc. as opposed to actual moneys paid on the foundations of a development other than moneys to secure equipment and materials for the construction of facilities etc.

2.12. Unite has too many projects come and go which piqued the interest of investors to garner the support and patronaged of MPs, MSP's, MWA, MNIA etc and many a councillor even to the extent of drawing up plans and gaining local public support only to end up no more than a "*seemed like a good idea at the time*" on reflection. Too many schemes have promised the earth but only left communities with

disappointment. Even with money and investment used to purchase land there are no guarantees that schemes will ever transpire into reality. The Swansea Tidal Lagoon project for example.

> Q7. Do you agree that a fee range of 2.5% to 7.5% of average capital costs is proportionate to the policy objective? What value would best balance impact while avoiding undue burden? Please provide reasons for your answer.

2.13. Unite would strongly disagree that capital costs are proportionate to policy objectives. Unite is aware of many a scheme that did not cost an enormous sum that in turn resulted in a greater than expected return granting more than what the policy envisaged. By way of contrast there are more than enough examples of eyewatering capital costs achieving far less than the ideal policy objective. One only has to look at HS2 with its bespoke trains, that were required to be lowered so they could fit under a bridge in Birmingham instead of lowering the track bed or increasing the clearance by raising the bridge so that off the shelf trains could be used on the route. If ever there was an example of waste and criminal incompetence HS2 has to be it.

> Q8. Would a fee at the lower end of the proposed range be sufficient to deter speculative or non-viable projects? Please provide reasons for your answer.
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> Q9. Would a fee at the upper end of the proposed range risk deterring viable, nonspeculative projects? Please provide reasons for your answer.

2.14. As with Q4 and Q5 earlier Unite has no intention of setting up or operating a data centre and therefore cannot judge if such a fee would act as an effective deterrent to the pursuit of a viable or speculative project as each investor may and hence Unite cannot pass comment.

> Q10. Do you agree with our assumptions that projects that are speculative/nonviable at point of application (or already in the queue) will not be able to secure such a fee based on any of the selected range? Please provide reasons for your answer.
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> Q11. If you disagree with Question 10, what assumptions can be improved and how? Please suggest what additional data Ofgem would need to make an informed decision.

2.15. Unite, like many, would be hard pressed to respond to this question as it is bases on a fee whose rate has yet to be determined, against the tenacity and will of the parties supporting any speculative project. The determination over the viability of a project or any non-viability can only, in truth, be determined on the day such a project switches on.

2.16. There are many factors not just access to revenue that determine if a project is or is not viable. The UK Government determined that a project is viable when[3] it passes a feasibility review covering technical capacity, financial return, legal compliance, operational fit, and timeline limits. Unite would argue that a project does not *operationally fit* if it does more harm to the community in which is being built than it delivers, regardless of the other business case supporting a project.

> Q12. Do you agree that the commitment fee should apply only to data centre projects equal to or above 40 MW that connect to the transmission system or have a transmission impact? Please provide reasons for your answer.
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> Q13. Is 40 MW the appropriate threshold for determining applicability? If not, what threshold should be used and why?

2.17. Unite believes that a commitment fee would be a necessity for projects requiring 10 MW. Overhead and underground power connections can only supply so much energy to one location without a major overhaul. To put this level of power demand into context, a typical large hospital complex requires, at peak 20MW. If new hospitals could not be built in an area because someone had speculated that there was going to be twice the level of electrical demand, possibly because of an AI Data centre, to power a collection of machines over treating people, Unite would imagine, there would be a national uproar.

2.18. Unite feels that any proposal for any grid connection proposal that could draw 10MW or more should be required to pay a substantial fee to secure a place on the waiting list, with the cost increasing commensurate with the amount of Watts they require.

2.19. Unite feels that this level of demand should be accompanied with the requirement that any roof space, walls and even windows[4] be utilised to generate as much solar energy as possible, to offset their grid needs (ideally employing the latest in PV-T panels[5]). While it is recognised that one major issue with data centres is the volume of water used to cool the servers, keeping any solar panels in their operational window in the summer ensures that the PV panels work even in the midst of a heatwave.

> Q14. We have used judgement to set a fee based on the impact of a fee on a hypothetical data centre's IRR. Are there examples of how this fee is calculated

[3] See:- https://www.gov.uk/guidance/viability

[4] There are several photo voltaic (PV) films that are available that can be added to buildings which have the twin benefits of generating electricity and providing insulation by reducing solar radiation entering the building and hence reducing the heat in the summer whilst helping prevent heat from escaping in the winter.

[5] A PV-T panel is a solar panel cooled by running a glycol mix through the pipes in order to not just obtain the maximum in electrical generation but also provide any complex with heat for hot water systems. The Virtu PVT panels for example are designed for use on flat roofs or walls to capture as much energy as possible from an arrangement of 300mm wide or 220mm wide tubes, while panels like the Solimpeks PV-T EXCELL 590 W panel is more your typical PV style panel, which boasts 22% electrical efficiency and 43% Thermal Efficiency.

and set in other jurisdictions (for example, USA, Spain, Ireland), that we could base it on to meet our objectives? Can you provide evidence that the regimes are consistent with the UK, and if not, what impact should that have on the calculation of the fee?

2.20. Unite understands that Spain uses a fee-based system and economic performance requirements, established under regulations like Royal Decree-Law 7/2026, to control speculative applications and manage capacity allocation for grid connectivity. Rather than relying solely on free queues, holders of demand access permits pay a periodic Capacity Reservation Charge (PRC) to the grid operator, which acts as an economic deterrent against permit hoarding. Permit holders for demand (and storage) pay a recurring monthly Reservation fee to the grid operator based on reserved capacity while the facility remains non-operational.

2.21. By way of contrast, Unite understands Greece uses financial guarantees, security bonds, and specific priority queue rules, rather than an auction or fee-based bidding system to manage grid connection congestion and weed out speculative applications. This is typically set at €100,000 per megawatt paid to the Independent Transmission Operator.

2.22. In France, on the other hand, RTE and Enedis, manage connection queues through technical feasibility studies, proportional capacity cost-sharing schemes (such as S3REnR), and financial guarantees designed to deter speculative projects rather than explicit bid-pricing auctions.

2.23. Germany manages overcrowded grid connection queues and deters speculative or duplicate applications through standardized framework tools like the maturity-based procedure[6]. It does also have a proposed reservation fee[7] payable under the government's Grid Package[8] which is benchmarked at around €1,500 per MW which is tied directly to the reserving grid connection capacity, to ensure that developers have involvement in providing the power. Developers must also commit to a one- off connection and infrastructure cost fee to reflect the strain and size of their asset placement.

2.24. Unite understands that Italy now controls the grid connection backlogs by replacing a first-come, first-served queue with a merit-based allocation system administered by Terna, requiring robust financial securities, connection fees, and priority rules based on project readiness rather than speculative batch filing. They mandate the payment of an upfront connection estimate and collateral guarantees.

Q15. Is there any key element that we did not consider that would improve the quality of our analysis to establish the appropriate data centre commitment fee? Please provide reasons for your answer.

[6] (Reifegradverfahren)
[7] (*Reservierungsgebühren*)
[8] (*Netzpaket*)

2.25. Unite feels that as data centres will be a very large drain on supply capacity that they should be required to generate at more than half of that power themselves via solar farms or other low carbon forms of power generation. Therefore, Unite would recommend that the proposal should include provisions for where the bidder believes the grid will be able to obtain the required level of supply in the local area connections. Clearly their level of demand would clearly be reduced if the data centre produced a proportion of its own supply.

2.26. Additionally, as any data centre will generate a very large amount of hot water, Unite would like to see details of where this water is to be obtained from, especially when there is a drought, and what the data centre proposes to do with all that heat. Clearly projects to improve the environment and the local community should be strongly prioritised over those that plan to be a drain on resources so they can provide AI capacity.

> Q16. Do you agree with our proposed threshold of 40 MW for which projects should be in scope of the commitment fee? Please provide the reasons for your answer.

2.27. Unite feels that 40MW is far too high and would suggest that fees should start at 1 MW and scale proportionally with size as happens in Greece or Germany, with a similar level of financial commitments to providing more than 50% of the power it consumes, support local community heating schemes & or a positive environmental/community project to reduce the projects carbon footprint.

2.28. Unite believes this threshold requirement is appropriate as it is the level stated in the proposed Schedule 2 (essential services and threshold requirements), to be inserted after paragraph 10 in the NIS Regulations by Cyber Security and Resilience (Network and Information Systems) Bill section 11 § 2[9].

> Q17. Do you agree with our proposal to apply the data centre commitment fee from offer acceptance to energisation? Please explain your reasoning.

2.29. Unite feels that a fee should be payable proportional to the size of the project and the length of time it remains on the queue for grid connectivity. This fee could be offset if the project paid for staff, training etc, to enhance the grid capacity and speed up the connection to that project and others in the area.

> Q18. Do you agree with our proposed definition of data centre, including the proposed approach for self-declaration and verification? Please provide the reasons for your answer.

[9] This can be found at https://bills.parliament.uk/publications/66772/documents/8423

2.30. Unite Does not believe that organisations should mark their own homework. Therefore, Unite has no problem with self-declaration but it has a problem with verification that the organisations claims are correct.

> Q19. Which adjustment process do you prefer regarding the fee value: review at NESO or Ofgem discretion, or periodic review? Do you agree with the frequency proposed for the periodic review? Please provide the reasons for your answer.

2.31. Unite would prefer option 2 over option 1 as option 1 involves having two bodies, NESO and Ofgem who could authorise adjustments meaning that parties could make a request for an adjustment from NESO, get refused due to some very valid reasons and then apply to Ofgem who could overrule NESO and vice versa. Option 2 where only NESO can approve amendments to proposals within the scope of their original proposal. In that way you have just the one party to also be capable of determining what resources are needed where. If there are two parties it makes any strategic planning more complex.

> Q20. Do you agree with our proposal to adjust the applicability threshold for the data centre commitment fee? Please provide the reasons for your answer.

2.32. Unite feels that if a party makes a proposal for a project and then expands or contracts the scale of that proposal that the fee should be increased as appropriate to the scale of the increase, back dated to the commencement of the original proposal and a fee applied to make the adjustment for every 0.1MW of additional capacity required. If the scale of the project diminishes the rate of the commencement fee should not be refundable.

2.33. Unite believes, that in doing so, it deters speculative proposals decreasing in scale to nothing, and it also prevents place holder proposals from joining the queue only to be expanded upon at the last minute to avoid paying the appropriate commencement fee and place holder fees throughout the duration to eventual switch on or cancellation of the project. By having a fixed regime where the appropriate fee has to be paid from the outset it is far easier to plan. Additionally if the final decision to allow the amendment or not is down to NESO, there is a level of control to evaluate if the grid can meet the additional capacity or not.

> Q21. Do you agree with our proposed sanction pre-energisation? Please provide the reasons for your answer.

2.34. As stated previously[10], Unite does not believe an organisation should mark their own homework. The scenarios as presented in the consultation are both based on the incorrect self-declaration of the data centre proposers. In both cases the consultation wants to punish the Data centre for what may be an innocent mistake that would have been picked up if they were not obliged to check their own homework. In one case the mistake is discovered pre-energisation of the connection

[10] At 2.30.

and in the second post-energisation. Unite feels that if NESO or Ofgem had checked the declaration and picked up the error, then the grid would know what to expect.

2.35. If on the other hand, the data centre proposal was deliberately misleading, then the proposal should have the connection supplied only up to the limit of the proposal and charged for that scale of connection. If the data centre then attempts to draw more energy, the supply should be disconnected, and the data centre should be warned that they will be rationed to that scale of connection as punishment for the deception. In this way the self-declaration can be enforced and punishment exacted where it will do the most damage to the scheme.

> Q22. Do you agree with our proposal to treat the data centre commitment fee as a security and accept existing types of securities? Do you agree with our proposal to pass forfeited securities to consumers through TNUoS charges? Please provide the reasons for your answer.

2.36. Unite believes that commitment fee is what it states on the tin. Other forms of security should only be accepted if they can easily be liquidated and converted into a form that can be shared to consumers if the securities are forfeited. Letters of credit from a qualified bank and cash would be acceptable but performance bonds are worth less than their stated value if the company is unexpectedly liquidated. The value of a performance bond from a liquidated company may typically be 10% of the original value. Therefore, Unite would suggest that if performance bonds are to be used as capital to cover the commitment fee, then the commitment fee should be ten times its normal value to provide security against such a scenario. Unite suspects that companies would then more readily provide cash or a secured letter of credit from a bank to the value of the commencement fee. Performance fees from banks are worth nothing if a company liquidates so these should not be an acceptable form of security.

2.37. Unite feels that forfeiture of the fees are to be passed on to consumers through the Transmission Network Use of System (TNUoS) charges is a good way to reduce these fees to all consumers and the benefit should become evident in each calendar years invoices or the payment of these funds as a rebate rather than being absorbed by the next years increases.

> Q23. Do you agree with our proposal in relation to the treatment of hybrid projects regarding the data centre commitment fee? Please provide the reasons for your answer.

2.38. Unite agrees with the proposals on the treatment of hybrid projects. A nondisclosure of the data centre use should be treated as misrepresentation which should lead to termination of the contract. If the proposal has two or more elements each element should be treated with the appropriate commencement fees and regime.

Q24. Do you agree with our proposal in relation to change of use and modification applications? Please provide the reasons for your answer.

2.39. With respect to Scenario 1 which relates to a connection application which sets out to be a non-data centre application but then changes to include a data centre element should be charged the commencement fee and any monthly fee, plus the appropriate amount of interest, from the date of the application, not the amendment and be subject to the approval of NESO, with respect to the availability of grid capacity. If NESO do not believe the project can be accomplished given their revised connection requirements, then the change should be treated as a new application and the place in the queue forfeited. To do otherwise invites companies to make non-data centre applications to avoid any monthly charges and for them to see the benefit of the commencement fee in their bank as opposed to that of the Government.

2.40. With respect to Scenario 2 where the project self-identified as a data centre application but then changes to a non-data centre application, Unite feels, that the project should be treated as a speculative bid and that any fees paid should be forfeit. This should not prevent the project from remaining in the queue in its current position if there is a remaining element which would benefit and increase the available supply capacity in that area.

2.41. In Scenario 3 an existing data centre makes a bid for additional capacity. In such a situation, Unite believes that the bid for this additional capacity should be treated in the same way as any other bid for connection capacity, to a data centre. This includes the application of a commitment fee, self-declaration and assessments plus any monthly fees applicable. NESO should assess the suitability of the scheme alongside the original criteria as if it were a totally separate project.

2.42. In Scenario 4 an existing data centre reduces its required supply requirements. Unite feels that if the data centre has been operating on the higher power demands and is capable of reducing its capacity requirements, then it has found ways to become more sustainable. This should be celebrated rather than punished and hence any savings in monthly fees could be returned. In this way it encourages data centres to reduce its operational requirements.

2.43. If, however, the developer in scenario 4 has never operated at the stated level of demand then it should forfeit the amount of capacity securities to consumers through TNUoS charges including any appropriate fees applicable with respect to the reduced capacity of the project.

Q25. Do you agree with our proposal in relation to treatment of self-terminating projects following an increase of the data centre commitment fee? Please provide the reasons for your answer.

Q26. What option do you prefer regarding other cancellation charges following self-termination: Option 1: being required to pay them or Option 2: not being required to pay them? Please provide the reasons for your answer.

2.44. Unite agrees that projects should be allowed to self-terminate without the requirement to pay the data centre commitment fee if they do so before the offer is accepted or the data centre commitment fee is implemented. Up to this point no resources have been put into place so no expense would have been spent by the OfGem or NESO. In such cases Unite feels that the effort and expense to put together a data centre application and hence Unite feels that Option 2 should apply and other cancellation charges/securities should be returned where the customer self-terminates in response to the introduction of the data centre commitment fee. However, if the return of securities should not occur just because the data centre commitment fee has increased, if anything the increase of these fees should highlight the level of commitment to the project.

Q27. Do you agree with our proposal in relation to exemptions and grace periods? Please provide the reasons for your answer

2.45. Unite believes that if there is a short period between the introduction of the fee and the energisation of a project then it would make sense to not require the production of securities only for them to be returned shortly after. In the similar situation where there is an increase in the fees, the difference between the former fees and the increased fees should not apply to projects within six months of energisation.

Q28. Do you have specific concerns or comments related to the proposals discussed in Chapter 5? Please provide the reasons for your answer.

2.46. Unite has no specific concerns other than those raised above regarding the content of Chapter 5 regarding the Data centre commitment fee.

2.47. Unite does feels that there should be a monthly charge levied to remain in the queue for a connection to the grid with this financial charge used to provide enough pressure on NESO and OfGem to force them to put pressure on grid providers to hire and train the additional staff needed to stop the long hours culture that has developed within the role of grid expansion and maintenance. If Ofgem and NESO cannot show positive progress in reducing connection times while at the same time reducing the hours jointers and other workers are performing over and above their standard core average 40 hour week then these fees should be returned. Unite believes that neither of these organisations is doing enough to protect the very workers that keep the grid working and able to respond to demands and especially to the loss of grid connections after a major storm incident.

Q29. Do you agree with our proposed data centre queue management milestone measures?

2.48. Unite feels that the completion of milestones is a good way to prove that a request for a connection is more than mere speculation and therefore agrees that there should be investments made and development work implemented while in the

queue for a connection. Clearly, a project should be at a stage that is capable of utilising the grid connection if one is to be provided. Therefore, Unite approves of this method of managing data centre applications.

2.49. Unite also feels that just because the project is ready to be energised, does not mean that the grid will have the power to energise the project without placing the UK supply / demand balance in jeopardy and increasing our energy instability. Unite strongly believes that there needs to be enough sustainable domestic electrical generation and storage in place to handle the demands of a data centre before energisation of any connections to the project.

2.50. Unite believes that if the respondents, a developers track-record highlights a history of speculative applications that end up going nowhere, then these should be treated less favourably than a developer that delivers on every occasion.

2.51. Unite believes that restrictions to reduce opportunities for gaming and to encourage projects to commit to a credible commercial route should already be in place but if these are not enough, actions should be taken to increase the level of restrictions. Unite feels, however, that restrictions should not be imposed that are so limiting as to discourage developers from making an application to build a data centre and obtain a grid connection to power it.

> Q30. Which of the three options for binding compute offtake evidence do you consider most appropriate, and why? Do you agree with our minded to position of a requirement for at least 20% of compute capacity for at least one year?

2.52. Unite feels that having to provide evidence that the data centre capacity will be used is a good way to remove speculation and the field of dreams approach of "*you build it and they will come*". Therefore, proof of firm commitments from credible companies or organisations that they will utilise the data centres capacity is needed.

2.53. As there will no doubt be an increase in demand for these capacity requests over time, however, requiring 20% of the capacity to be filled prior to energisation would mean that projects would only be built that could reach 20% of capacity even before they start operations. If this happens it will mean smaller data centres and a far larger number of requests for increased capacity as the data centre becomes utilised to a greater degree over time. For this reason, out of the options available Unite would favour Option 1, which only requires proof of binding commitments for some compute capacity, with no minimum duration of arrangement. Unite would have preferred if there was some evidence of the duration of the arrangements for compute capacity but this was not an Option within those presented.

> Q31. For the compute offtake threshold, should the percentage threshold or minimum contract duration should be higher, lower, or designed differently for different data centre business models?

2.54. Unite obviously feels that the longer the commitment for compute offtake the better when it comes to show that the facility will utilise the grid capacity and resources it has been allocated. Unite believes that a duration of a contract for one year shows that the data centre project has a customer willing to commit if the data centre has the capacity to deliver on its promises, but equally there is a lot of time and expense being allocated to the grid providing the scale of connection that may be required and hence Unite feels that the data centre should be required to show at least one major commitment for a duration longer than one year.

> Q32. For the long-lead procurement requirement, should the requirement cover transformers and switchgear only, or should other long-lead electrical equipment be accepted?

2.55. Unite feels that the long-lead procurement requirement should include the addition of any infrastructure needed to provide the connection and supply just the data centre. Unite feels that if the data centre power demands the construction of a new power line, be that overground with its pylons or the burial of a cable, then this cost and the cost of energising that line should also be added to the account regarding the amount that would need to be covered by the developer.

> Q33. For the long-lead procurement requirement, should equipment be assessed against indicative voltage-linked ranges, or should NESO and distribution network operators assess whether it is appropriate to the project's particular connection and design?

2.56. Unite would hope that NESO and the developer would already be in discussions over the procurement requirements for the project and work hand in hand towards a workable compromise between what the developer wants and what NESO and the grid can provide to energise the developer's systems.

> Q34. Do you agree with our proposal to require data centre projects to demonstrate financial capability through either an investment-grade credit rating or legally enforceable credit support committed to the project?

2.57. As stated earlier, Unite stated in this response[11] that cash or a letter of credit would from a bank could be acceptable collateral to cover the data centre commitment fee. Unite does not believe a credible bank would issue such a line of credit to a project that does not have an investment grade credit rating or way of covering that line of credit. As such, Unite feels that the production of a letter of credit from such a bank should be acceptable evidence that the bank has confidence that the business is viable.

> Q35. For financial capability, should a credit rating held by the developer, project company or a financially supporting parent company be accepted, and what

[11] At 2.36 to this response.

evidence should demonstrate that parent-company support is committed to the relevant project?

2.58. Unite believes that the credit rating held by the developer, project company or financial supporting parent company is not evidence that the project itself is viable given the support could be withdrawn at any time. Unite believes that the only measure of the financial credibility of the project should be the ability of a creditable financial institution to have enough faith in the projects ability to cover its financial commitments enough to issue them with a letter of credit. If the financial institution is wrong, then they are not the type of projects developers would be taking the financial hit and hence it is in their interest to ensure that the project has the financial capability to see the project through to operational returns.

Q36. Are investment grade credit ratings, BBB− from Standard & Poor's or Fitch and Baa3 from Moody's, appropriate minimum ratings?

2.59. Unite would suggest that if a company has a credit score of less than 40 out of 100 or had a greater than 10% likelihood of failure from Moody's Fame or a CCC score from S&P Global Ratings is a clear sign of a company in trouble especially if the credit watch outlook is negative.

Q37. What alternative forms of credit support should be accepted, including letters of credit, cash deposits, collateral, committed financing facilities or other equivalent security?

2.60. Unite would only suggest letters of credit from reputable companies, such banks or building societies that have been in business for more than a decade should be seen as acceptable.

Q38. Should the amount of credit support be linked to the project's capacity, expected capital cost, remaining development expenditure or another measure, and how should it be calibrated?

2.61. Unite believes that the size of the credit facility should be proportionate to the scale of the project's capital costs and remaining development expenditure.

Q39. Do you agree that evidence relating to EN 50600, TIA-942 or Tier Certification of Design Documents should satisfy the proposed technical capability requirement at M6.Dc? Are there other standards or certifications that should be accepted, and why?

2.62. Unite feels that EN 50600,[12] and Telecommunications Industry Association (TIA)-942 Design Certification[13] or Tier Certification of Design Documents should satisfy the proposed technical capability requirement at M6.Dc.[14] as highlighted in the consultation, by this stage all the technical criteria has been locked in so that there is enough information to demonstrate to a potential investor enough to secure the financial resources needed.

> Q40. If you don't agree with our proposed technical and financial capability tests, how would you change them? What other financial and technical capability tests could we use?

2.63. Unite agreeds with the broad technical and capability tests that OfGem and Neso could use.

> Q41. Do you agree with our proposal to structure the data centre queue management milestones framework around distinct Self-operation and Lease or Sale Pathways? Please explain whether the proposed pathways accurately reflect data centre business models and identify any models that would not be appropriately accommodated.

2.64. As explained earlier Unite[15] has no intention of setting up or running a data centre but given the very nature of computing, as defined by Moore's Law[16], it would assume that the target audience would be looking for a data processing capacity that evolves over time to incorporate the very latest in data processing speed and accuracy. Unite would therefore assume that a data centre is either owned by a company who needs the processing power and has therefore invested in its own data centre, a company that needs processing power for a short duration before they obtain their own data centre, built to their specifications, or a company who has built a data centre larger than they need currently needs, (as they are looking to expand) who that is willing to lease out the unused capacity to a third party.

2.65. Unite believes that the nature of a data centre that it one which will increase in processing capacity rapidly over time, which could result in a request for more power. It also means that the equipment installed on energisation will be out of date in six years as by then the processors will be up to eight times as fast.

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[12] The British Standard EN 50600 series cover planning and business risk analysis (EN 50600-1), building construction (EN 50600-2-1), power supply and distribution (EN 50600-2-2), environmental control (EN 50600-2-3), telecommunications cabling infrastructure (EN 50600-2-4), and security systems (EN 50600-2-5).

[13] TIA-942 Design Certification is available at rating levels from Rated-1 (Basic Site Infrastructure) to Rated-4 (Fault-Tolerant Infrastructure). The certification covers architecture, electrical, mechanical and telecommunications infrastructure.

[14] M6.Dc is the is the point at which the data centre project must agree a construction plan demonstrating how it will progress its works to meet the relevant commissioning and completion dates.

[15] At 2.10

[16] **Moore's Law**, an observation made by Gordon Moore, the co-founder of Intel, in 1965. It states that the number of transistors on a microchip doubles roughly every two years, leading to exponential growth in computing power and lower costs. Sadly it also leads to more heat and power consumption too.

2.66. Back in 1976 server chips did not exist but the Zilog Z80 (released in July 1976) ran on a single 5 Volt (V) supply and consumed roughly 0.3 to 0.45 Watts (300–450 mW) depending on the clock speed. By the time the first servers were built (by 1986) Intel 80386 (i386)[17] had been widely deployed in 1986 servers (like the Compaq Deskpro 386), this 32-bit chip consumed roughly 2.0W to 3.0W operating at 16 MHz to 20 MHz.

2.67. In 2000 your typical server blade contained processors with a clock speed18 of 500 MHz to 1GHz, holding a single-core Central Processing Units (CPU's) requiring 30 W to 50 W per chip and 128 MB up to 1 GB of Randon Access Memory (RAM) backed up by 10GB to 30GB hard drives. By 2010 the chips had 4 to 8 cores running at 2.26 GHz to 3.0 GHz typically requiring 60W to 130W per CPU with memory requirements jumping to a baseline 12 GB to 384 GB or 1TB on specialized full-hight enterprise nodes19. By 2020 the number of processing cores on a single chip had increased to between 28 and 56 cores with clock speeds up to 4.0GHz requiring 85W to 150W per CPU and high-speed six-channel Double Data Rate 4 (DDR4) short-term RAM configurations, running at speeds up to 2,933 mega-transfers per second (MT/s)[20]. Today we are looking at a single high-performance server blade packing in 288 or more CPU cores Modern AI processors demand 700W to 1,200W per chip today operating at 4.5Ghz to 5.1 GHz clock speed depending on the thermal limits of the material.

2.68. Over the past 50 years we have gone from less than a third of an Watt per chip to over 1.2 thousand Watts with pace increasing year on year. 26 years we have gone from 30W to 50W per chip to 700W to 1.2kW per CPU in power demands and if Moore's Law continues to hold, this demand for ever more powerful processors will be insatiable.

2.69. It is therefore desirable to have access to the latest processors at the fastest speeds and the only way to guarantee that access is to build your own data centre with the latest highest specification equipment, to ensure the maximum life out of that equipment, provided of course that the company has the money to build it. Leasing access may provide the companies needs for now but if a new data centre opens in four-years then the company may wish to change allegiances. Thankfully computer racking space may enable the replacement of the old with new, but that would require more power.

2.70. Therefore, Unite believes that the lifespan of a data centre will be limited unless it has the capacity to upgrade to the latest in computer power. This means that if the

[17] launched late 1985

[18] Number of calculations it could perform per second.

[19] An enterprise node is a large-scale device, server, or software instance within a corporate Enterprise Network Concept | CCNP Architecture Explained that processes, stores, or routes business data. It acts as a heavy-duty connection point for company operations, security management, and scaled data sharing.

[20] . It measures the data transfer rate of computer memory like RAM. It tells you how many millions of times data moves into or out of the memory chip each second.

data centre is able to secure a lease covering multiple years or is being built to serve a single customer (google for example) then it is likely that that data centre will be around for a while and given priority over one who has only a limited number of interested parties signed up to use its facilities.

> Q42. Do you agree with our proposed timing for each evidence requirement, including pathway selection and MoU at M0.5.Dc, long-lead procurement at M2.Dc and firm compute offtaker evidence at M6.Dc? Please provide evidence on when viable, non-speculative projects can ordinarily supply each form of evidence.

2.71. As stated above Unite feels that if there is enough evidence of one or more Memorandums of Understanding (MoU) at the fifth data centre progression milestone (or the second milestone if there is a long lead procurement time) then this is a very good indicator that the project is not or is now no longer speculative in nature.

> Q43. Do you agree with our options for the thresholds at which the data centre queue management milestones are implemented, and do you agree with our proposed threshold of 10 MW rated IT load? Please provide your reasoning and supporting evidence.

2.72. As highlighted above[21] a single blade in a server CPU in 2026 could draw 1.2kW of electrical energy from the grid. So a threshold of 10MW might be on the low side as 10MW is only enough to power 8,333 of these CPU's. If

> Q44. Do you agree that the data centre queue management milestones should apply to relevant projects connecting at both transmission and distribution? Please explain whether any differences between the transmission and distribution connection processes require a different approach.

2.73. Unite feels that the capability to demonstrate the viability of a transmission and distribution connection should subject to milestone requirements as it clearly reviews if a project is on track or is slipping behind.

2.74. Unite feels that a core part of the milestone should be an assessment of the number of workers and the average number of hours per day provided by this workforce to demonstrate just how seriously the management of the transmission and distribution connection take the welfare of their workers. Unite firmly believes that a 16-hour hard stop is too many hours for any worker to be expected to perform in a working day and that management need to demonstrate they are investing in the workforce by providing training to new recruits.

2.75. Sadly, none of us are getting any younger and Unite believes that the energy sector is facing a looming crisis due to the age profile of its workers. If the transmission and

[21] At 2.66

distribution business is not supported by enough workers who will be there to make the final connections, thus enabling supply to the data centre then the whole projects timeline will be in jeopardy.

> Q45. Do you agree with the proposed approach to applying the data centre queue management milestones to existing and future projects? Please identify any circumstances in which different treatment would be appropriate.

2.76. Unite feels that with certain tweaks to keep the milestones in line with the current technology demands and performance, the milestones would be an appropriate way to quantify just how many projects were at each milestone and hence enabling a greater understanding of the energy demands that each project will have o the grid, be that positive, if there is a parallel generation element or negative with respect to available generation and distribution capacity.

> Q46. Do you agree with the proposed approach to the submission, assessment and ongoing validity of milestone evidence? What process should apply where evidence is incomplete, has expired, is no longer effective or needs to be replaced?

2.77. Unite believes that the proposed approach is a valid one to assess the submission, assessment and ongoing validity of milestone evidence. Unite feels that if evidence is incomplete, expired or is no longer effective or is in need of replacement, that the project cannot be allowed to progress beyond that milestone. Clearly if the project has stalled to that degree one has to ask just how valid is that project and how committed are its backers. If this happens the project should be seen as failing to achieve that milestone until the next review of the project and as such other projects that are able to demonstrate milestone achievement should be able to overtake the stalled project in the queue. If the project cannot achieve the next milestone in the lead up to completion and provide the requirements with six months of milestone failure, then the project should be required to start again from scratch and be treated as a fresh application.

> Q47. Do you agree that failure to provide satisfactory evidence by the applicable deadline should result in the project being treated as having failed the relevant queue management milestone? Please identify any circumstances in which a project should instead be allowed to remedy the failure, and how this could work.

2.78. Unite believes that such a hard and fast rule regarding the deadlines for milestone completion, focusses the mind toward achieving that goal. If there is to be some leniency as to why evidence was submitted late then that leniency has to be for a very justified reason that cannot include industrial action, given management of staff is entirely at the control of the HR department. As before[22] if the project fails to achieve a milestone it should be given the opportunity to remain in the queue for six months with other projects allowed to overtake it if those alternative projects can achieve

[22] See 2.76

their milestones. After six months stalled projects should then be required to start again.

2.79. Unite believes that if there has been evidence of deliberate misrepresentation including the provision of misleading evidence should result in the project being dropped by NESO and OfGem and the guilty parties banned from any involvement with a future bid for a data centre connection, including the forfeiture of any securities provided up to this point.

> Q48. Do you agree with our proposed exemptions and transitional arrangements for existing data centre projects? Please identify any circumstances in which a different exemption or transitional period would be appropriate.

2.80. Unite feels that if the data centre already has a connection agreement in place or is about to energise its systems within six months of implementation of the additional data centre milestones then it should be exempt from this process.

> Q49. Do you agree that the proposed legal text changes as set out in the ancillary documents give effect to the policy intent as set out in this consultation? Please provide reasons for your answer.
>
> Q50. Do you have any suggestions or comments regarding potential legal text changes to regulatory documents that we did not consider? Please provide reasons for your answer.

2.81. Unite would highlight that the changes as highlighted in the consultation supporting legal text changes are only enough to facilitate the base-line introduction of the data centre milestone process. If, for example, as suggested in the consultation, the process is to be expanded to incorporate transmission and distribution of electricity to prospective data centres, then further changes would be required. Similarly if there are other changes required brought about by the outcome of the consultation then these too would require further amendments.

2.82. Unite would also highlight that there should be some leniency given for factors beyond the control of the developers, such as changes to the political climate, acts of god, increases in energy costs caused by international incidents that they clearly would not envisage at the outset of the process which could have a material impact on the viability of a milestone.

3. Conclusion

3.1. Unite believes that the number of options and speed of connections to the grid is heavily impacted by the lack of investment into not just the infrastructure but also the availability of staff trained to perform the vital functions of connecting the wires together. At present jointers are working unsustainable hours and performing an unprecedented number of tasks in the time they have in a day leaving little time for sleep or a social life. It comes to something when there is

meant to be a hard stop after 16 hours of work and health and safety notices advising 20-minute power naps in their van followed by the consumption of a Red Bull before returning to work if they feel fatigued[23].

3.2. Unite is extremely concerned that workers tempted to drive after such extensive shifts, or worse over the course of a week of such activity, are putting their lives and the lives of other road users in danger. Yet the practice of allowing such activities to continue, to keep the lights on and keep the delays to the waiting list, of grid connection to a minimum.

3.3. Unite feels that it is critical that there is enough realistic energy generation capability supplied to the grid in the event where the wind drops, we face darkness or even heavy cloud cover to cover off the energy supply demands of a data centre whilst still providing power to other customers without dipping into imported energy from outside the UK. Unite therefore believes that data centres need to wait in the queue until there is a realistic prospect of available supply could outstrip demand.

3.4. Since 2020 the UK has lost that capability and hence is vulnerable to the international markets which will always prioritise supply to their own customers before supplying the UK. In recent years we have faced the prospect of rolling blackouts in London due to the lack of generational capacity and only avoided this by paying Centrica far more than the rate per kWh for releasing power from a battery storage facility in Belgium.

3.5. It is criminal that the last Conservative government left the UK with a serious and long lasting shortage of generational capacity but considering how they left the rest of the public sector, especially hospitals, the pay of medical staff, schools and their failures to address water industry debt and the blatant profiteering of several industries, especially in the energy industry, this should have come as no surprise.

3.6. Unite further believe it is no good paying wind farms not to generate electricity in Scotland if we then need to use fossil fuels in the south of the country. This clearly demonstrates that there is also a desire to ensure that there is enough power transmission capacity to supply the data centre too.

3.7. Data Centres need to be guaranteed a supply of energy to ensure they have the power needed to complete their calculations and processing, and they will not function if the power falls below a set threshold. Consequently, as data centres will be a constant drain on the generation and distribution network, it is only right to insist that the data centre does all it can to reduce its negative impact on the grid. The supply needs of such a facility will also fluctuate depending on the complexity of the operations and the number of CPU cores are devoted to the task, therefore there needs to be capacity that can act as a

[23] Health and Safety advice sent out to linesmen and jointers working in excess of 12 hour days by Western Power.

buffer and absorb excess generation or deliver enough additional power, instantaneously.

3.8. Unite believe that the addition of such a huge variable power drain is going to give the grid nightmares and hence Unite would strongly suggest that that OfGem & NESO only provides a data centre with the energy to power their systems after the UK has the capacity to meet and exceed their needs.

3.9. If the computer continues to follow Moore's Law then the computer will grow and require ever larger amounts of energy. Unite firmly believes that until such time that we are able to supply unlimited amounts of energy not just to power processors but run the cooling system that stops the server blades bursting into flames.

3.10. There, undoubtably, many ways in which Ofgem could remove speculative Data Centre projects from the queue and prioritise others but Unite would stress, whatever options are settled on, more investment is needed into the people to make the network operational and sustainable in the long term.

3.11. Unite believes that the amount of water required from the cooling system should only be extracted from areas where the abstraction will not impact the ecosystem and leave enough for human & animal life to thrive. As the supply of fresh water is also critical for our food chain this must also be prioritised over any abstraction by a data centre and its conversion into a form that can be used to cool the processors. It needs to be recognised that not all the power needed by a data centre is to power the CPU's. Vast amounts will also be needed to desalinate sea water or clean fresh supplies of debris before it enters the server room. When this now heated water leaves the heat has to go somewhere and Unite feels this is best to use the hot water to either produce power or do some good in the community in which it resides by providing pre heated water to people's homes and businesses.

3.12. It is very possible that the customers for the processing power of the data centre will want ever more speed and after only a short window of operation this capacity will be superseded by a more powerful centre next door that wants more electrical and computing power and hence the power demands from each individual centre is short lived. Unite therefore recommends that the design of the grid connection capacity is one that can be easily upgraded to suit the needs of the replacement datacentre and the one following rather than design it to deliver to just enough to meet the current needs of the site.

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