

22 October 2024

## Position Paper on Transmission Impact Assessment (TIA) Thresholds

### 1. Purpose

The purpose of this document is to set out the position of the England, Wales and Scotland Transmission Owners in regard to revising the existing Transmission Impact Assessment (TIA) Thresholds for those embedded generators that qualify by capacity, to be assessed via the process. The document first provides the original ask as part of DESNZ and Ofgem's Connections Action Plan (CAP), before exploring the basis for the TIA Thresholds in England and Wales (Section 3), Southern Scotland (Section 4) and Northern Scotland (Section 5). Consistency across GB Networks is addressed and the impacts of ongoing industry initiatives (Sections 6 and 7, respectively) before making final recommendations (Section 8).

The TIA process that was written into CUSC via a Code Modification to CUSC (CMP298) in January of this year, was designed on the same terms and principles of the existing Appendix G process.

The Appendix G process was introduced as part of trials in England and Wales in early 2016 and sat alongside the existing Statement of Works (SoW) processes. The Appendix G process was developed to address two key concerns of the affected DNOs:

- The existing SoW process was not fit for purpose in managing the churn of small and medium embedded generation in E&W.
- The existing CUSC rules around SoW left it to the DNO to decide the size of the generator needing to be assessed – DNOs found this difficult and inconsistent against a landscape of increasing levels of Distributed Energy Resources (DER) so requested that any process developed gave a clear capacity in MW.

The Appendix G process first introduced the concept of a Relevant Embedded Power Stations (REPS) for the purposes of the process being applied to Small and Medium Embedded Power Stations (1 MW to 99MW in E&W). The TIA process today replicates this application to Small and Medium Embedded Power Stations for consistency and alignment with wider EU Code definitions and RFG.

### 2. Background

The Connections Action Plan (CAP) identifies the issue that the dependency of Transmission Works have on Distribution connected projects with some extracts from the CAP attached as an Annex. A desired outcome from the CAP is that Distribution customers have an earlier understanding of the impact on their projects of Transmission works and have other options for 'customer choice' driven earlier connection dates where network security and safety will allow.

Within the text there is explicit reference to reviewing the TIA thresholds:

*"We would also like to see the ESO and DNOs assess and review the thresholds for TIAs; to accelerate connection timescales for distribution customers."*

### 3. Review of TIA Thresholds in England & Wales

CUSC very clearly defines the classification of generators by size linking each size to specific commercial and technical requirements and processes but ultimately utilises definitions in the Grid Code to set the levels. Generator classifications in England & Wales are as follows, noting there are different classifications in Scotland:

- <50MW – small generator
- >=50 – 99.9 MW – medium generator
- >= 100MW – Large generator

These classifications are currently under review as part of the Grid Code GC117 code modification, which seeks to standardise the classification of generators, proposing a common single solution across the whole of GB. Note that an alternative has been raised to decouple the definitions in CUSC from those in the Grid Code.

Whilst CUSC makes reference to Small Generators (i.e., <50MW) the threshold for the TIA process is set at 1MW:

3. For the purposes of the **Evaluation of Transmission Impact** and unless otherwise indicated by **The Company** under **CUSC 6.5.1(b), Embedded Power Stations of 1MW and above will be deemed to have an impact on the National Electricity Transmission System** and must be included in Appendix G Schedule 1.

Therefore, based on these classifications all small (1MW and above) and medium embedded generators are required to be assessed via the TIA process.

#### 3.1. Scope

This piece of work is to review the TIA lower threshold (i.e., 1MW in England and Wales) to see if that threshold could be increased such that some embedded generation projects sit outside of the TIA process and what added benefits that might bring to connection dates and process requirements for these projects that are no longer deemed “relevant” because they are lower than the uplifted number.

A direct impact of raising this threshold, would be that a further tranche of distribution applications could progress more quickly without having to wait until any TIA has been undertaken and would not have any risk associated with transmission works delaying their Connection Date. Note that one of the metrics cited in the CAP is the percentage of connections impacted by Transmission works and this change would improve this metric, particularly in terms of volume of connections.

As this 1MW threshold has been in place now since 2016, greater confidence and experience in trends and attrition rates has been gained in terms of accepted and connected projects. Whilst there is a risk in aggregate, the impact of say, a single 5MW is very small in terms of the amps that would materialise on the Transmission network.

The assumptions that are now being used to assess the impact on the Transmission network have changed significantly and therefore the task is to review this lower threshold in the context of the change in risk appetite to determine whether this will accelerate connection dates.

Any potential change to the threshold would need to consider what information would need to be provided by DNOs. Regular updates (e.g., monthly akin to the existing Appendix G process) could be provided by the DNO on any accepted projects in the 1 – <5MW range. This would give the visibility of the pipeline and allow the modelling of the impact of this tranche of customers. Therefore, any change in the threshold does not necessarily adversely impact on the ability to model the aggregate impact on the network.

### 3.2. Out of Scope

For the avoidance of doubt the following are outside of scope of this paper:

- Large embedded i.e. currently over 99.9MW (for England and Wales),
- Embedded demand connections,
- Directly connected generation and demand,
- Planning assumptions used to assess the impact on the transmission system,
- Revising the Appendix G process,
- Differentiating between DNOs and iDNOs.

### 3.3. Justification

Table 1a and Table 1b below<sup>1</sup> highlights the volumes of connected generation across the twelve distribution regions in England and Wales. The table highlights that on average DER between 1≤10MW that is already connected **represents 9%** of all connected capacity on the distribution system, whereas DER between 1≤5MW **makes up only 7%** of all connected DER capacity.

Table 1a: Table of all connected DER that is 1MW > X > 10MW

	All connected DER projects between 1MW and < 10MW	How many MWs?	All connected DER projects	How many MWs?	Percentage of <10MW against all DER (%)
LPN	49	175.3	57	414.3	42.3
SPN	130	129.3	174	1917.7	6.7
SSEN	306	348.6	407	3505.8	9.9
NGED SWest	312	393.9	361	2397.9	16.4
EPN	283	108.8	428	5220.7	2.1
NGED West	324	384.2	424	3238.0	11.9
NGED East	184	368.1	227	1581.9	23.3
NGED Swales	143	217.9	202	1879.9	11.6
SP Manweb	177	292.3	325	6427.4	4.5
NPG (Y)	155	229.6	233	2662.5	8.6
NPG (N)	115	235.5	157	1579.0	14.9
ENWL	237	283.0	297	2914.4	9.7
	<b>2,415</b>	<b>3,166.3</b>	<b>3,292</b>	<b>33,739.4</b>	

<sup>1</sup> Source: "Small Gen" Spreadsheet, from ">1MW" tab, for each DNO from the 2024 Week24 Submission

Table 12b: Table of all connected DER that is 1MW &gt; X &gt; 5MW

	All connected DER projects between 1MW and < 5MW	How many MWs?	All connected DER projects	How many MWs?	Percentage of <5MW against all DER (%)
LPN	35	76.2	57	414.3	18.4
SPN	91	24.2	174	1917.7	1.3
SSEN	196	269.6	407	3505.8	7.7
NGED SWest	199	229.4	361	2397.9	9.6
EPN	201	40.8	428	5220.7	0.8
NGED West	239	372.1	424	3238.0	11.5
NGED East	145	317.4	227	1581.9	20.1
NGED Swales	93	151.7	202	1879.9	8.1
SP Manweb	139	280.1	325	6427.4	4.4
NPG (Y)	110	164.9	233	2662.5	6.2
NPG (N)	83	170.5	157	1579.0	10.8
ENWL	187	228.5	297	2914.4	7.8
	<b>1,718</b>	<b>2,325</b>	<b>3,292</b>	<b>33,739.4</b>	

Table 2 below<sup>2</sup> for comparison looks at the total amount of connected DER that is less than 1MW. Whilst the amount of all connected DER in this category is over 4.5GW this currently represents only a 15% percentage of total connected DER and this impact will reduce when considering the total amount of DER due to connect over the 10 years.

Table 23: Table of all connected DER that is less than 1MW

	All connected DER <1MW (MW)
LPN	79
SPN	248
SSEN	83
NGED SWest	552
EPN	572
NGED West	521
NGED East	698
NGED Swales	258
SPManweb	245
NPG (Y)	734
NPG (N)	367
ENWL	298
	<b>4,655</b>

Finally, Table 3a and Table 3b below<sup>3</sup> displays the volumes of DER between 1- <10MW and 1- <5MW that are yet to connect.

Table 34a: All not yet connected DER from 1MW &gt; X &gt; 10MW

<sup>2</sup> Source: "Small Gen" Spreadsheet, from "<1MW" tab, for each DNO from the 2024 Week24 Submission

<sup>3</sup> Source: current Appendix G information provided by NESO in March 2024. N.B. not all DNOs in England and Wales have signed Appendix Gs for all GSPs.

Appendix G Data	All not yet connected DER between 1MW and < 10MW	How many MWs?
NGED	199	850
UKPN	183	745
SPM	31	12
ENWL	79	291.5
NPG	83	303
SSEN	72	330
<b>Total</b>	<b>572</b>	<b>2,531.5</b>

Table 35b: All not yet connected DER from 1MW > X > 5MW

Appendix G Data	All not yet connected DER between 1MW and < 5MW	How many MWs?
NGED	103	232.3
UKPN	114	265.7
SPM	2	6
ENWL	67	120
NPG	67	136.4
SSEN	37	92.1
<b>Total</b>	<b>390</b>	<b>852.5</b>

Figure 1: All accepted DER by Technology Type in MWs as of July 2024 (>1MW)

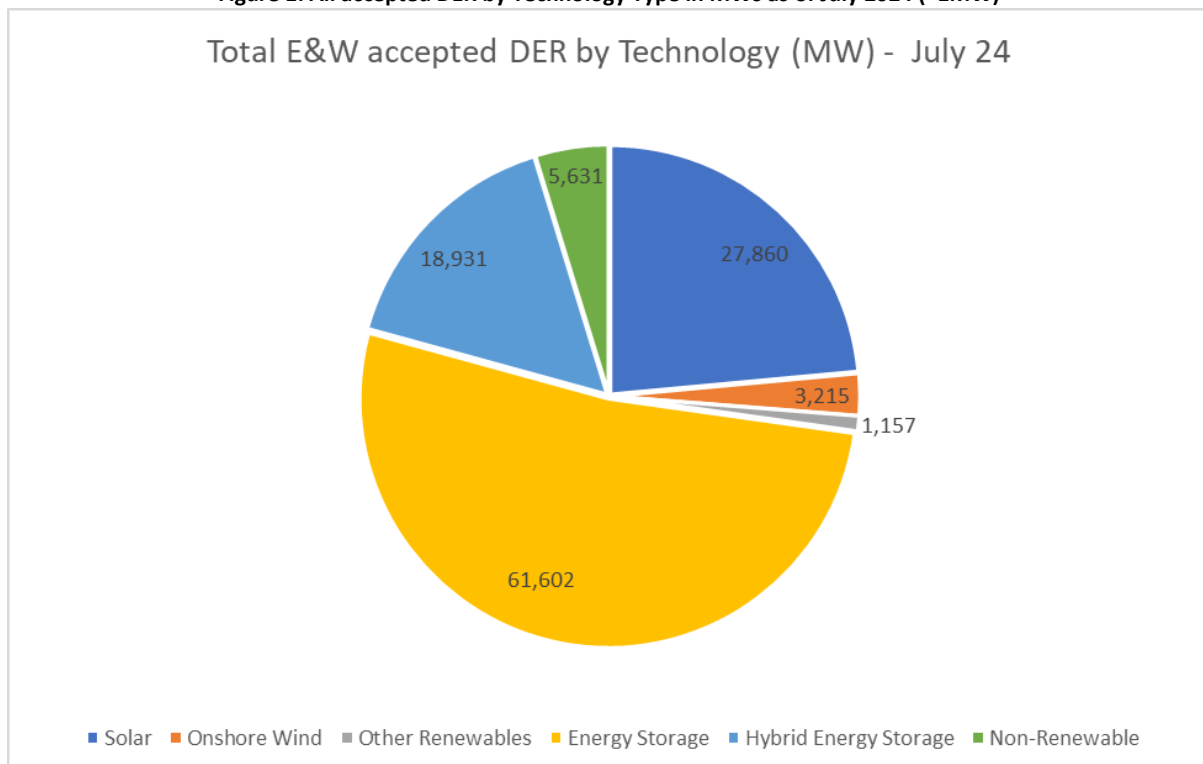


Figure 1 above shows that as of July 2024 there were circa 137GW of accepted demand connections and DER (inclusive of 118GW generation) across England and Wales, accounting for 5787 individual

customers<sup>4</sup>. Nearly half of these projects are Battery Energy Storage System (BESS) project which make up 45% (61.6 GW) of the overall total. This is more than double the next highest technology of 20% from Solar with a 27.8GW share. Both Conventional Demand and Hybrid Energy Storage each account for a 14% or 18.9 GW contribution. The remaining 7% is made up of 4% non-renewables at 5.6GW, 2% Onshore Wind at 3.2GW and finally a 1.1GW contribution from Other Renewables makes up the remaining 1%.

Comparing Table 3b against Figure 1, demonstrates that DER projects that are 1 – 9.9MW and 1 – 4.9MW **make up a circa 2.5% and 0.7%** share of the overall distribution connections queue. It could therefore be argued that given <10MW and <5MW customers are more than likely to connect at much lower voltages (33kV and below) their overall impact on the transmission system is negligible and therefore an exception could be made to remove them from the TIA process.

**Table 4: Summary Table of Tables 1A, 1B, 3A and 3B**

England and Wales connections		England and Wales connections pipeline	
Up to 5MW	Up to 10MW	Up to 5MW	Up to 10MW
7%	9%	1%	3%

### 3.4. SWOT analysis of increasing the Transmission Impact Assessment threshold to <5MW from <1MW in England and Wales

Table 4 provides the results of a detailed qualitative SWOT analysis, in which features of the impact of revising the TIA lower threshold were assessed. From this analysis, whilst the number items listed under the “weakness” category is greater than the “strengths” category it has been determined that the relative size of the impact of the strengths outweighs the weaknesses because they can be mitigated against.

**Table 5: SWOT analysis for revising the TIA threshold**

Strengths (Positives of increase)	Weakness (Negatives of increase)
<ul style="list-style-type: none"> <li>Will provide DNOs with the opportunity to accelerate the connection of up to 390 DER that are less than 5MW across England and Wales.</li> <li>A total of 852.5MW of DER across all DNO's, in England and Wales, will be able to connect without having to go through a Transmission Impact Assessment.</li> <li>Reduction in the amount of time it takes DER under 5MW to receive an Offer from Distribution and to get connected because they are not subject to a TIA assessment and therefore transmission reinforcement works are not required to be complete before they can connect.</li> <li>Helps enable the government's 2030 target (Clean Power 2030) – First ready and needed, first connected.</li> <li>Reduces the number of TIA applications the DNOs, NESO and NGET will need to process.</li> </ul>	<ul style="list-style-type: none"> <li>An increase to 5MW would adversely impact on the ability of NGET to model the aggregate impact on NGET's network.</li> <li>Pending a minded to position from Ofgem on GC117 and the impact this will have on the TIA process, increasing the lower threshold would potentially capture less DER customers and become surpassed by a separate process for &gt;10MW DER – subject to a WCAM.</li> <li>Could potentially result in an increase in constraint costs due to NESO having to curtail directly connected customers.</li> <li>Would require an additional change to the CUSC via a separate modification.</li> <li>The risk of a DER that requires a Substation Control System (SCS) database change being missed.</li> <li>This could result in an increase in costs based onto DER that go through the TIA process.</li> </ul>

<sup>4</sup> Based on ENA data from the combined T&D databook

<ul style="list-style-type: none"> <li>• Allows community-based project to connect to the system and reduce the financial burden on these projects.</li> <li>• Allows commercial premises installing roof top solar, typically to reduce their demand, to progress more quickly.</li> </ul>	<ul style="list-style-type: none"> <li>• While Connections Reform is looking to increase the barrier for entry, this removes barriers for a specific set of customers.</li> <li>• This could increase the number of applications for DER projects that are &lt;5MW compared to what we currently receive.</li> </ul>
<b>Opportunities (Advantages of allowing the increase)</b>	<b>Threats (Negatives of not increasing)</b>
<ul style="list-style-type: none"> <li>• Provides time to assess the full impact of the other industry initiatives i.e., GSP Technical Limits, Reallocation of Capacity and Connection Reform.</li> <li>• Reduces the risk of creating contractual confusion by implementing several different changes at the same time.</li> <li>• Visibility of applications &lt;5MW applying can be tracked through the Appendix G through a cumulative running total.</li> <li>• Visibility of applications &lt;5MW connecting to Distribution can be tracked through the Week 24 submission process.</li> </ul>	<ul style="list-style-type: none"> <li>• 390 DER that are less than 5MW across England and Wales will not be able to accelerate and contribute a total of 852.5MW towards CP30.</li> <li>• Revising the lower TIA threshold could result in an influx of connections &lt;5MW or some developers opting to apply for &lt;5MW connections followed by increases in capacity as part of a later application.</li> <li>• Could result in additional works being required for DER 5MW+ if DER &lt;5MW is included in the TIA and their volumes become substantial.</li> </ul>

### 3.5. Conclusion

Given the qualitative analysis presented above and the volume of not yet connected DER that is <10MW, NGET and NESO would support the proposal to amend the lower qualifying thresholds to 5MW at this stage for the TIA Process.

The impact of increasing the TIA lower threshold is thought to be:

- Reducing the time taken for DER to understand the requirement for transmission works because they are not subject to a TIA assessment and potential Transmission works if required – won't change the time taken to receive an Offer from DNOs.
- Reducing the financial liability for small-scale projects as they are required to secure transmission reinforcement works.
- Enable rapid acceleration of small-scale generation projects to connect to the distribution system to achieve NetZero targets.
- Reduces the number of TIA applications the DNOs and NGET will need to process.

## 4. Review of TIA Thresholds in Scotland, South

SP Energy Networks completed a review in 2018 for the connection of multiple G83<sup>5</sup> (now ENA EREC G98) inverter-based generation applications in the SPD area to determine if a threshold for Transmission assessments can be applied. One of the outputs of this review was that:

- Where any new G83 multiple inverter-connected generation (site capacity of 200kW and below) is to be installed with a requirement for export within Transmission constrained

<sup>5</sup> ENA EREC G83 (Recommendations for the Connection of Type Tested Small-scale Embedded Generators (Up to 16A per Phase) in Parallel with Low-Voltage Distribution Systems) now superseded by ENA EREC G98 (Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks on or after 27 April 2019).

networks, no Statement of Works will be required. The risk of allowing new generation at this level is mitigated by the assumption that time and duration when solar PV will reach peak output is limited to approximately 2% of the year for approximately 20 minutes at a time. As such the likelihood of coincidence of peak PV output and peak wind output resulting in a constraint is minimised.

Other factors were considered, including managing the impact on voltage levels and fault levels given that small inverter-based generation connections may have a notable impact on the SPT network given the typical SPT/SPD boundary voltage level of 33kV. While the impact on voltage levels and fault levels could be mitigated, the thermal limit of 200kW was determined to be the limiting factor when considering new applications.

While the SPT and SPD networks have developed since this original review:

- The premise provided above for defining the 200kW limit remains (including consideration of the change from ENA EREC G83 to ENA EREC G98). Although, currently in a limited number of areas, as more generation capacity is added to the distribution network SPD/SPT see an argument for lowering this limit to aid the operation of the network.
- Load Management Schemes (LMS) have since been introduced in the SPD / SPT network to allow customers to connect to the Distribution network earlier and ahead of transmission reinforcement works. LMS has been rolled out in 14 SPD GSPs and contracted for installation at 44 other GSPs, connecting 557MW of generation ahead of transmission reinforcement works with a further 5,448MW of generation contracted to connect. LMS goes some way to mitigating against the impact on connection dates that Transmission reinforcement may have, however raising the lower threshold for Transmission Impact Assessments is likely lead to existing customers connected through LMS experiencing an increase in curtailment.
- 'Net zero connections' are currently available within SPD Distribution to allow customers to install generation behind the meter to offset their current load with generation (without exporting onto the network) without triggering a Transmission Impact Assessment. These connections again work to mitigating against the impact on connection dates that a Transmission Impact Assessment may have.

Therefore, SPT / SPD believe that the current lower threshold for Transmission Impact Assessments of 200kW strikes the right balance between accelerating connections ahead of Transmission reinforcements while maintaining a manageable level of risk in both the SPD Distribution and SPT Transmission networks. Note that this guidance will be subject to regular review under SP Energy Networks internal quality control policies.

## 5. Review of TIA Thresholds in Scotland, North

SSEN Transmission, working in collaboration with SSEN Distribution, have undertaken a review of the Transmission Impact Assessment Threshold across the north of Scotland transmission area. This review has considered a range of factors including the likely number of customers, risk assessment of the security of the transmission network, and a study of the contribution new technologies can make.

Some of the key conclusions from this review include that almost 80% of the contracted to connect generation technology mix is made up from Solar PV generation and that these Solar PV generation profiles only reach a high-power output condition for infrequent and very short periods of time. Minimal Solar PV peaks as well as their low temporal coincidence with Wind generation minimise the risk of an increase in Solar PV schemes connecting under a raised TIA limit. This review has also



assessed historical power flow data at GSPs to ensure that sites have sufficient available capacity to accommodate this threshold increase without significant risk.

The review has concluded that the threshold can be raised to 200kW for the majority of GSPs in the SSEN Transmission network. A four-fold increase in the threshold – from 50kW to 200kW – will see more projects being able to connect without the cost and delay that comes with this assessment needing to be carried out.

The change means that around 35 customers in mainland Scotland, with a combined generating potential of over 5MW, will now be able to connect significantly earlier than previously anticipated. The threshold adjustment allows some prospective customers to save on the cost of application fees, too. The change comes into effect for SSEN Transmission's mainland operating area in the north of Scotland but does not include grid supply points on the islands surrounding the mainland, where the threshold remains 50kW due to transmission network constraints.

SSEN Transmission will continue to review the TIA threshold and assess any future opportunities to further increase it or identify any emerging concerns around network security that might require it to be adjusted.

## 6. Consistency across GB networks

TIA Threshold is, to an extent, based on consideration of the capacity of the T/D interface. This, in turn, is reflective of the system voltage at the T/D interface, which is different in England and Wales compared to Scotland

The issue of the difference in voltage levels for Transmission between England, Wales and Scotland was assessed during the British Electricity Trading and Transmission Arrangements (BETTA) reforms<sup>6</sup>. Ofgem concluded at the time (2003) that redefining the scope of transmission to exclude the 132kV network in Scotland would be inappropriate at a fundamental level, for the following reasons, amongst others:

- The existing distinction drawn in the licensing regime between transmission and distribution is not arbitrary. It reflects the physical purpose of different sets of wires. The primary purpose of the 132kV network in Scotland is the bulk transfer of electricity. It is clear, even through the most cursory inspection of the network in Scotland, that a system excluding 132kV lines would not be sufficient to transfer bulk flows of energy around Scotland, i.e., to perform the function of transmission.
- While it could be argued that under certain circumstances some 132kV wires in England and Wales facilitate the bulk transfer of energy (i.e. perform the function of transmission), and that conversely some 132kV wires in Scotland perform the function of local distribution, Ofgem were of the view that a (principally) voltage-based definition of transmission continues to be robust when considered in aggregate, i.e. that the existing boundary of 132kV and above in Scotland and above 132kV in England and Wales should continue to be used to differentiate between transmission and distribution. Although this assessment might change over time, as a consequence of growth in embedded generation, currently there is an order of magnitude difference between Scotland and England and Wales in the proportion of 132kV network that primarily serves the purpose of transmission.

---

<sup>6</sup> [https://www.ofgem.gov.uk/sites/default/files/docs/2003/11/5168-small\\_generators\\_issues\\_20nov03.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2003/11/5168-small_generators_issues_20nov03.pdf)

It is the view of this working group that the above points remain true. Furthermore, implementing a reclassification of the 132kV network in Scotland as distribution would require:

- Legislative and regulatory change.
- Changes to physical infrastructure, such as metering points.
- Changes to commercial arrangements for existing connected and contracted 132kV customers, with the potential for significant legal challenge.
- Change to the approach of cost recovery for new connections.

A detailed assessment of the potential impact may be required to fully quantify the impact of reclassifying the 132kV network in Scotland. However, it is the view of this working group that reclassifying the 132kV network in Scotland at this point in time, given the significant development of the Scottish networks, would be extremely challenging and provide disproportionately limited benefits to customers.

The relative size of GSPs is reflective of the voltage boundary between Transmission and Distribution, but also takes into consideration differences in the relative demand requirements at the load centres in Scotland (compared to England and Wales) and reflects the requirements for the TOs to plan, develop and maintain an efficient, coordinated and economical system of electricity transmission. Constructing assets that were nominally oversized for the demand that they were required to supply would be regarded as uneconomic and inefficient – and therefore not in the best interests of customers who ultimately would have to bear the costs of this investment.

## 7. Impact of other industry code changes and Initiatives

### 7.1. Impact assessment of GC117

Grid Code Modification GC0117 was raised in June 2018 and is awaiting a decision from Ofgem (expected to be determine in December 2024) aims to improve transparency and consistency of access arrangements across GB by the creation of a pan-GB commonality of Power Station requirements. The intended purpose is to harmonise the Grid Code definitions of Small, Medium and Large Power Stations across all host TO regions to 10MW.

If Ofgem's decision in December 2024 is to approve this change to future applications after the implementation date than this will likely have an impact on the TIA process.

A distinction between Small, Medium, and Large Embedded Power Stations will need to be drawn out in the Codes such that the TIA process will still be applicable for Relevant Embedded Power Stations that are less than 100MW (for England and Wales) and greater than the proposed new lower TIA threshold. If this distinction is not made apparent, then a revised CUSC process to cover of transmission assessments for Relevant Embedded Power Stations will need to be created as part of a Code Working Group. This may need to be the subject of a WCAM as part of the GC117 Modification.

### 7.2. GSP Technical Limits and Reallocation of Capacity

The analysis and recommendation of this paper should be considered as only one element of a wider suite of industry initiatives that have already been implemented to accelerate first ready, first connect projects. Technical Limits has accelerated connection dates by up to 13 years generating over 9.6GW of clean energy projects, triple the output of Hinkley Point C power station. Networks are seeing an unprecedented rise in customer applications, with lead times for connections increasing significantly

and customers receiving connection dates as late as 2038. These dates are leading to a risk of not reaching the UK's net-zero targets, as customers who can support these targets cannot connect. Together we've developed and introduced Technical Limits at Grid Supply Points (GSPs) across GB allowing DNOs to connect customers ahead of Transmission reinforcement works.

Across GB, within Phase 1 sites alone providing:

- 406 Offers issued, totalling over 14GW
- 128 offers already accepted, totalling 4.65GW
- Customers' connection dates have improved by an average of 6.4 years, with some customers experiencing up to 13 years of acceleration. Average curtailment of only 21.7%, meaning customers can have confidence that the curtailment is going to be at a minimum.

The NESO Policy for Capacity Reallocation by Distribution Networks for Embedded Projects is currently established over 80 GSPs with a rollout of further sites currently happening now. The terms and conditions for this policy were included within Phase 2 of the GSP Technical Limits implementation plan. It enables Distribution Network Operators (DNOs) to reallocate capacity in the event of termination or disconnection of REPS that have already undergone assessment through established processes listed on an existing Appendix G.

For REPS that are already listed on an existing Appendix G and have not triggered transmission works (linked to a Construction Agreement or Construction Works Schedule in Appendix G), their terminated firm capacity may be reallocated to other REPS in the queue by the Distribution Network. This reallocation allows previously studied REPS the opportunity to advance from a non-firm or long lead time connection. Providing another tool in the suite of initiatives to accelerate first ready, first connect projects.

## 8. Recommendations

The following list of recommendations should be considered when implementing the proposed changes to the lower TIA thresholds:

- Analysis carried out by NGET supports an increase in the lower TIA threshold to at least 5MW.
- Following CMP298, the minimum threshold for E&W is captured within CUSC. A separate code modification led by NESO is recommended need to be raised and go through that process – NGET/NESO do not believe that this is within the scope of any existing CUSC Mods.
- To ensure the impacts of the new minimum threshold, Project Progressions would need to be updated with an additional section to capture additional requirements for NESO / NGET to understand the potential impacts.
  - DNOs to track and report via TIA technical data and Appendix Gs the volumes of contracted not yet connected DER <5MW by technology type.
- Following the changes to the Project Progression, NESO / NGET will be monitoring all sites to fully understand the impact and will be using the extra data to understand any emerging trends. Also, following GC139 and including DFTC within that remit, this will be another tool to allow NESO / NGET to track DER connections.
  - DNOs to track via the annual Week 24 planning data submission process the volumes of connected DER <5MW by technology type.

- NESO and TOs to regularly review the lower TIA threshold comparative to volumes of contracted not yet connected DER and connect DER <5MW by technology type.
- Retrospective application of the revised lower TIA threshold could be applied, resulting in contracted by not connected DER <5MW being removed from the Appendix Gs but connected DER <5MW remaining on the Appendix G (to not impact the calculation of Technical Limits). The process to go through will be the discussion of future working groups and legal wording in the proposed CUSC Mod.

The review in the North of Scotland has confirmed that the TIA threshold for the majority of GSP's in the north of Scotland can be increased from 50kW to 200kW in line with the following recommendations:

- The Materiality Trigger established through the individual Appendix G applications will supersede the TIA threshold for the network for each individual GSP. This could allow generators larger than 200kW to connect without a TIA as long as there is sufficient materiality trigger headroom specified in the Appendix G for the GSP.
- The DNO (SHEPD) is to track and report the accepted applications of generators between 50kW-<200kW to the TO (SHET) through an agreed monthly process.
- The increase in the threshold is kept under review at each GSP to help us understand the emerging impact from increased unassessed connection activity.
- Where a change in the TIA threshold could have increased risks to safety and security, the threshold is held at 50kW at these more sensitive areas of the network comprising lengthy radial transmission circuits to the islands.
- This increase in the TIA threshold can apply retrospectively in the north of Scotland and existing contracted customers sized between 50kW-<200kW will be able to connect with their existing contracts to be updated or voided to allow this.

## 9. Annex

Slide covering this aspect in the ENA governance document

DRAFT

Delivery Vehicle	SCG (Networks) / ESO (additional)
Owner	B Godfrey / W Kirk-Wilson

CAP 3.5 - Improve data and processes & sharpen obligations and incentives

CAP 3.5.2 – Assess and review thresholds for transmission assessment

KEY INSIGHTS

- Competing drivers for rationalization of thresholds for transmission assessment are resulting in potentially uncoordinated decisions
- The need for rationalization of thresholds for transmission assessment persists to improve customer journeys
- This action is partially covered under ESO's additional options work (package 2), with discussion/recommendation to CDB in March 2024

Action ID and Title	Activities & Milestones progressed this period	RAG	Activities & Milestones planned for next period	Core Metric Update		Decisions Required
CAP 3.5.2 EIA Additional 5 ESO Additional Package 2  Assess and review thresholds for transmission assessment	<ul style="list-style-type: none"><li>• Achieve industry alignment across GC0117, Technical Limits, FDTC and other associated developments</li><li>• This is partially covered under package 2 of ESO's 'additional options' chapter (5) of connections reform final recommendations:</li><li>• <b>"Further flex the assumptions for impact of embedded projects – this would build on the technical limits work in the 3-Point Plan, eg, by either rolling out technical limits to more GSPs, or by developing the concept further so it can be rolled out to the more complex sites (such as shared GSPs). We note that the CAP requests continued roll out of technical limits for all GSPs (including those with import constraints, where a similar approach could be used for demand)."</b></li></ul>		<ul style="list-style-type: none"><li>• Position paper on Technical Limit thresholds benefits has been drafted</li><li>• Initial discussions opened between Technical Limits group and GC0117</li><li>• Aim to take discussion paper on CAP 3.5.2 (and associated aspects of Package 2) to CPAG in February 2024 prior to bringing something for discussion / recommendation to CDB in March 2024</li></ul>	Unified position landed on thresholds		Confirm ENA & ESO Action covered under this CAP Action
				September '24		

### **3.5b Reducing friction at the Transmission/Distribution Interface**

Distribution network connections can have an impact on the transmission system. This interactivity is increasing, with over 80% of GSPs across GB, now being subject to transmission constraints. This results in increasing numbers of distribution connections triggering the Project Progression process, adding time and cost to their connections.

Even with these improvements, the current arrangements are not adequate. Many customers are experiencing unacceptably long delays (up to two years in some cases) between receiving a DNO connection offer (where this is conditional on a TIA) and receiving a final connection offer including the transmission aspects, including any cost and timing impacts. Distribution connections are increasingly dependent on transmission reinforcements, resulting in the conditional connection dates (which only cover distribution network aspects) being revised, sometimes by as much as 10 years, frequently making such projects unviable. In some cases, communication is poor, with little or no information on the likely outcome of the TIA for distribution customers, meaning connection dates can be moved very materially, sometimes with little warning. This uncertainty creates risk for project developers and investors.

There are two fundamental problems that need to be addressed;

1. the process by which DNOs request, and are allocated, transmission capacity from the ESO is not fit for purpose. It typically takes too long, and distribution connection customers are not being provided with adequate information about likely transmission impacts at an early enough stage.
2. around 64%<sup>57</sup> of generation and storage projects are unable to connect to the distribution network without transmission reinforcement works.

---

<sup>57</sup> Proportion of distribution capacity confirmed as dependent on, or under assessment for dependency on, transmission reinforcements. Data provided by DNOs.

Actions to resolve these two problems are described below.

*Desired Outcome: A clear, consistent, streamlined and transparent process to provide faster connection offers to distribution connected projects that have transmission system impacts on appropriate timeframes.*

<b>Action</b>	<b>ESO and DNOs to work closely to improve existing processes at the transmission/distribution interface and to ensure that any proposed future connection process enables DNOs to secure and allocate GSP capacity efficiently, providing certainty for distribution connection customers.</b>
<b>Action lead</b>	ESO/DNOs
<b>Action introduction date / impact date</b>	Q4 2023 / Q1 2024
<b>Progress indicator</b>	Improved communication and customer experience Transmission works impacts for distribution customers are flagged and understood more quickly
<b>Action review date</b>	Q1 2024

In the short-term we expect to see a marked improvement in the performance of DNOs and the ESO. We expect to see the average period between a DNO identifying the potential need for a TIA and the customer receiving a full connection offer, including any transmission works, substantially reduced. We recognise that there are no comprehensive regulatory timelines

applying to this process and Ofgem will consider this as part of its wider review of connections incentives and obligations (see Chapter 3.5d). In the meantime, we would like to see the ESO and DNOs working together to introduce and clearly communicate a consistent approach by the end of January 2024, resulting in regular and predictable Project Progression submission timescales, underpinned by voluntary targets and monitoring/reporting of timelines.

We would also like to see the ESO and DNOs assess and review the thresholds for TIAs; to accelerate connection timescales for distribution customers.

Recommendation for future work and can not be done without a code change

Whilst NGET could ask for special permission for a CUSC Change – its seems better to be something the NESO should take forward

Purely a recommendation – taken forward at the appropriate time