TEP Review and Commentary on Relevant Sections in Chapter 3 of the TNEI supporting document to Ofgem's 'Consultation on Final Needs Case and Potential Delivery Models' for the Hinkley Point C Connection Project (HPCC)

1. Introduction

1.1 National Grid asked TEP to review and comment on sections of Chapter 3 of the TNEI supporting document which address aspects of TEP's expertise and work undertaken on the HPCC.

1.2 TEP is an independent environmental consultancy which has worked on electricity generation, transmission, distribution and interconnection projects for over 20 years. It has undertaken consenting and licensing for a wide range of clients including Scottish Power, Western Power Distribution, Electricity North West, DONG Energy and National Grid. It has worked primarily in the UK but also has experience in overhead line projects overseas. TEP has worked on the HPCC since initial feasibility studies for the connection in 2009 and worked closely with National Grid on all environmental and consenting aspects of the project including engagement with stakeholders and regulatory bodies relevant to the Development Consent Order.

1.3 This review and commentary focuses on Chapter 3 of the TNEI supporting document to Ofgem's report. It notes that TNEI acknowledges that it is not possible to demonstrate that consent would not have been granted if the T-pylon was not proposed in addition to undergrounding and use of standard lattice pylons. It sets out that the T-pylon has been endorsed by the government as a contemporary design it looks to have in service. Considering the T-pylon as an option is consistent with EN-1's advice and has been undertaken in National Grid projects subsequent to HPCC with each consideration made on its merits with reference to evidence, particular circumstances and results of engagement with stakeholders.

1.4 The review also considers the findings of the TNEI Report after authors considered a very small number of viewpoints but did not visit the existing T-pylon line at Eakring. It finds the observations unpersuasive and contrary to government statements when introducing the T-pylon to be introduced into service.

2. TNEI Report Section 3.1 – The Necessity of T-Pylon Selection in Gaining Consent

2.1 This section of the TNEI report comments on BDB's legal opinion obtained by NGET and endorsed by Michael Humphries QC that the use of T-pylons in the design of the connection formed part of a suite of appropriate mitigation that reduced consenting risk.

2.2 The TNEI report states that *'it cannot be concluded from these opinions that consent would not have been granted if lattice towers were proposed in the place of T-pylons'.* However the TNEI report goes on to acknowledge that *'the counterfactual outcome cannot be known as it is impossible to know the determination of the Examining Authority and SoS should an alternative scheme have been proposed' (emphasis added).* TNEI's summary at the end of Chapter 3 agrees that the selection of the T-

pylon provided evidence to consultees and the Secretary of State that all measures to reduce the impact of the project had been employed. TEP does not consider it is tenable for TNEI to hold an opinion that National Grid has not provided enough evidence to prove what it describes as the '*impossible*'.

2.3 The TNEI report goes on to state that *'All recent new high voltage overhead line builds in the UK have utilised lattice towers'*, suggesting that as these gained consent there is no reason to suppose that the Hinkley Point C Connection would not have done if lattice pylon supports had been proposed throughout. However the T-pylon was not available for consideration as a pylon design option prior to the prototype installation of the winning pylon design in 2013, and so this cannot be assumed.

2.4 The TNEI report specifically refers to the Beauly – Denny overhead line. This project was granted consent in 2010 under the Electricity Act 1989 and Town and Country Planning (Scotland) Act 1997. The T-pylon was not available to the Beauly-Denny project and it was consented under a different regime to the Hinkley Point C Connection Project. The Beauly – Denny overhead line project is in the Scottish Highlands. These are different regimes, landscapes and project specific circumstances and conclusions about how they might inter-relate as projects cannot be drawn without detailed understanding of the relative aspects.

2.5 The TNEI report also refers to National Grid's Richborough Connection, which is a 400kV overhead line utilising steel lattice pylons, which has recently been granted development consent (August 2017). TEP undertook the landscape and visual assessment of this project and presented evidence to the DCO Examination. A Pylon Design Options Report (PDOR) was prepared for this project to consider the use of the T-pylon, low height lattice and standard height lattice pylons through all sections of the route. The Richborough Connection PDOR concluded that the standard lattice pylon would result in fewer adverse environmental effects through the majority of the route with a preference for lower height lattice pylons, in terms of landscape and views, at the eastern (Richborough) end of the route.

2.6 The decision-making on pylon type at Richborough followed a very similar assessment process to the HPCCP, reported in its PDOR. However, steel lattice pylons were selected in response to the local landscape and views, where the route followed lower ground within a valley or running parallel to and between ridges of higher ground, and where there would be particular benefits in terms of backgrounding. The presence of existing overhead lines supported by lattice pylons along sections of the route that would remain in place, and the distribution of visual receptors in the locality such that the views experienced would particularly benefit from backgrounding, were other factors that influenced the pylon type chosen.

Government Advice and Guidance

2.7 In July 2013 the government's Secretary of State for Energy and Climate Change stated:

> *"To see T-pylon becoming a reality just 20 months after winning the competition, is a fantastic achievement for National Grid and the Danish architects, Bystrup, and I'd like to congratulate them on their progress. One*

of the key objectives of the Pylon Design Competition was to see if innovations in design and technology could improve an 85 year old structure, and one that has divided popular opinion since its inauguration in the 1920s.

"We face a significant challenge over the coming years connecting new electricity plants to our homes and businesses. Now communities can be offered a new choice and a radical departure from the traditional lattice. A smaller pylon, one third shorter than its predecessor, with different finishes allowing it to blend into the landscape – T pylon is a striking and elegant design.

"I'm looking forward to seeing T-pylon put into service; a graceful, refined structure fit for the needs of our low carbon, 21st century."

(Source: https://www.gov.uk/government/news/t-pylon-offered-for-electricity-transmission-connection-in-the-uk-for-the-first-time)

2.8 There has not been any government advice or guidance issued indicating that use of the T-pylon should be avoided or limited. Following the development of a real and viable alternative to the traditional steel lattice pylon, it is reasonable to expect this option to be considered as part of the next overhead line connection projects. This is what National Grid has done. The outcomes of the Pylon Design Option Studies have demonstrated that the specific landscape and visual context of each project has a strong influence on which pylon design is most appropriate to minimise landscape and visual effects. There are clear reasons for the different approaches taken on the Hinkley Point C and Richborough Connections.

3. <u>Section 3.2 - Process</u>

3.1 The TNEI report concludes that an appropriate process was followed with regard to gathering evidence to support the decision to propose the T-pylon. Section 3.2 of the TNEI report notes the emphasis that the DCO application process places on consultation and requirements for a substantive evidence base to demonstrate that good design has been achieved. The TNEI report also notes the rigorous nature of the examination process and level of scrutiny that the DCO application was subjected to, and that the Examining Authority was satisfied that the process followed was appropriate.

3.2 The context for any DCO application relating to energy infrastructure is provided by the Overarching National Policy Statement (NPS) for Energy (EN-1). EN-1 recognises that *'in most cases, there will be more than one technological approach by which it is possible to make such a connection or reinforce the network (for example, by overhead line or underground cable) and the costs and benefits of these alternatives should be properly considered as set out in EN-5 (in particular section 2.8) before any overhead line proposal is consented'* (EN-1 paragraph 3.7.10).

3.3 Good Design is an important part of EN-1 which makes it clear that good design goes beyond physical appearance, with the functionality of an object, including fitness for purpose and sustainability, being equally as important. Paragraph 4.5.3 states that

'the IPC [The Secretary of State] should satisfy itself that the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located) as far as possible. Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation'.

3.4 EN-1 is supplemented by relevant guidance in the National Policy Statement for Electricity Networks Infrastructure (EN-5). EN-5 paragraph 2.5.2 states that *'Proposals for electricity networks infrastructure should demonstrate good design in their approach to mitigating the potential adverse impacts which can be associated with overhead lines'*. The main opportunities for mitigating potential adverse landscape and visual impacts of electricity networks infrastructure include the *'selection of the most suitable type and design of support structure (i.e. different lattice tower types, use of wooden poles etc.), in order to minimise the overall visual impact on the landscape'* (EN-5 paragraph 2.8.10).

3.5 Section 3.2 of the TNEI Report includes a review (by IDP Landscape consultancy or IDPL) of the Hinkley Point C Connection Pylon Design Options Report (PDOR) published August 2013, which set out a detailed appraisal of pylon design options within each section of the preferred route (excluding the section through the Mendip Hills AONB, which was proposed as underground cables).

3.6 The TNEI report notes that the PDOR *'provides reasoned justification for the technology choices for each section and it is considered that this is an appropriate and reasonable approach to design'* and further on concludes that *'the PDOR is a considered report that has reasonably explored the design options'*.

3.7 IDPL considers that in the landscape and visual impacts reported in the PDOR, height is more frequently referenced when explaining design decisions, whilst there is more limited reference to the visual mass of the T-pylon design. TEP considers the landscape and visual assessment within the PDOR to have taken a balanced approach. For example in the landscape and visual assessment of effects for Section D, reference is made to the potential greater prominence of the T-pylon or to the benefit of lattice steel pylons in relation to backgrounding effects (or both) at Paragraphs 9.75, 9.79, 9.81, 9.140, 9.141, 9.142, 9.143, 9.144 and 9.146. Overall in Section D the PDOR concludes that the T-pylon would be preferred overall due to its lower height in combination with the screening effects of vegetation and built form. However, this is not before the full range of factors, as set out in Appendix B of the PDOR, has been considered in relation to the landscape and visual receptors within the study area for that section.

3.8 Section 3.2 of the TNEI report lists the principles in Appendix B of the PDOR as follows:

- Landscape type;
- Filtering and screening of views;
- Backgrounding;
- Visibility of other overhead lines;

- Distance from the visual receptor; and
- Angle of view and elevation.

3.9 IDPL's review finds that *'the influence of all six criteria upon the potential landscape and visual impacts associated with both lattice and T-pylon are all reasonably explored and used as the basis of informing judgements as to which type of pylon would be more appropriate in differing locations along the preferred route'*.

3.10 The principles listed above are explored further in Appendix B of the PDOR in relation to the advantages and disadvantages of the differing pylon types, which are influenced by the differences between the pylon design options in terms of height and mass. These principles and the terminology used are referred to in the main assessment when comparing the pylon design options for sections of the route and IDPL acknowledges a balanced approach has been taken to the landscape and visual assessment and reporting.

3.11 The PDOR determined that in terms of visual effects, whilst the T-pylon would be more prominent in some views (within 250m), in the majority of views (ranging in distance) the T-pylon would result in a lesser adverse effect due to its lower height and in turn greater degree of screening provided by intervening vegetation and built form. As noted in relation to the distance from the visual receptor at paragraph 49 in Appendix B of the PDOR, overhead line routeing has sought to maximise separation from sensitive receptors such as dwellings on the grounds of amenity and many visual receptors would have views of the proposed overhead line beyond 250m.

3.12 In this sense, the landscape and visual assessments set out in the PDOR conclude that height is the overriding factor in determining a preference between pylon design options on the HPCCP. This is in the context of the predominantly flat Somerset levels, where the sections of overhead line would mainly be viewed against a sky background, where the taller lattice steel pylons would result in limited benefit to landscape and views compared to the T-pylon.

3.13 After the PDOR was published along with the Preliminary Environmental Information Report in August 2013, further verified photomontages were prepared and the T-pylon test line visited at Eakring. These provided further insight into the potential benefits of the T-pylon over the traditional steel lattice pylon. Overall the verified photomontages prepared for both pylon design options as part of the PEIR, the Environmental Statement and during the Examination demonstrate the benefit of the T-pylon. There are a number of photomontage viewpoints which illustrate a particular benefit, where the lower height T-pylon would lessen the adverse effect on a view. Of the representative selection of 24 photomontage viewpoints within relevant sections along the route, the verified photomontages which demonstrate a clear benefit include:

- VPB3 (Figure 7.9.06);
- VPB4 (Figure 7.9.07);
- VPB7 (Figure 7.9.08);
- VPD5 (Figure 7.9.20);
- VPD9 (Figure 7.9.21);

- VPD10 (Figure 7.9.22);
- VPD14 (Figure 7.9.23);
- VPD16 (Figure 7.9.24);
- VPE10 – Alternative Route Option B (Figure 7.9.30);
- VPF3 - Alternative Route Option B (Figure 7.9.32); and
- VPF5 – Alternative Route Option B (Figure 7.9.34).

3.14 Whilst a limited number of comparative photomontages were prepared for each section of the route where the T-pylon has been consented, this effect would be experienced across the landscape by a large number of visual receptors and from varying viewpoints.

3.15 The Eakring site visit (attended by the Examining Authority (ExA) and the Joint Councils during the Examination Period) has demonstrated that there are particular benefits in the T-pylon's simple, uncluttered and clean design which can be appreciated particularly from nearer viewpoints (in relation to the effects this might have on the perception of the scale of the landscape, please see the response in Part 3 below). The photographs below illustrate this point. They have not been taken for comparative purposes (and the height difference between the two is not apparent), but they provide a near view of a 400kV traditional steel lattice suspension pylon and a near view of a suspension T-pylon at Eakring. Whilst the steel lattice pylon design has less mass, the framework occupies a larger volume of space than the T-pylon, interrupting a greater proportion of the near views.

3.16 As reported in the PDOR a light grey finish on the T-pylon will not perform as well as the steel lattice pylon when backgrounded by landform. However the site visit to Eakring and the T-pylon colour agreed during the DCO examination suggests that the T-pylon will perform well when seen against a typical UK sky background (see

photograph below taken at Eakring showing the T-pylons in Light Grey (RAL 7035): this is a lighter grey than the Agate Grey (RAL 7038) agreed with the Joint Councils during the examination as the colour to be used on the T-pylon on the HPCCP).

3.17 A 400kV steel lattice pylon will be more often seen against a sky background due to its greater height and will more likely be contrasted against the sky due to its standard mid-grey paint colour and the shadow cast by its angular steelwork (see photograph below of 400kV standard lattice pylon).

3.18 Both the Joint Councils and ExA had the benefit of visiting the T-pylon test line at Eakring during the examination to fully appreciate the T-pylon design. TEP understands that National Grid has suggested that Ofgem and its advisors visit

Eakring (and a steel lattice 400kV overhead line for comparison), to assist reaching its conclusions on the benefits of the T-pylon design; it endorses that suggestion.

4. Section 3.3 – T-pylon Benefits, 3.3.1 Reduction in Magnitude of Landscape and Visual Impacts

4.1 Section 3.3.1 of the TNEI report explains that IDPL visited 12 viewpoints included in the Environmental Statement to consider whether there would be a demonstrably different magnitude of effect on landscape character and visual amenity were lattice pylons proposed rather than T-pylons.

4.2 The TNEI Report does not explain which were these viewpoints and on which sections of the connection, although it is assumed that viewpoints were visited where photomontage views were available. TEP considers that a review of 12 out of the nearly 1,000 viewpoints that were assessed as part of the ES represents a very limited review in which to base conclusions that *'in the main any differences were thought to be limited.*' It also is not clear how these conclusions were drawn in the context of the 12 viewpoints, as IDPL's review is presented as seven bullet points listing some general observations or thoughts on the visual characteristics of the lattice pylon and the T-pylon.

4.3 The first of these bullet points is repeated at the last bullet point and makes the observation that lattice pylons will more readily 'merge' or 'disappear' into the landscape in distant views where the pylons are backgrounded by land (ie where they are not viewed on the skyline). The benefit of lattice pylons in situations where they are backgrounded by land is clearly noted in the PDOR. However in the context of the Somerset Levels, in the majority of views of the overhead line connection, pylons would be seen against the sky, and this particularly would be the case with the greater height of the standard lattice pylons.

4.4 The next three bullet points following the review of the 12 viewpoints make observations about the T-pylon, which relate to this pylon design being a new structure in the landscape, and so unfamiliar to the public. It cannot be valid to assert that innovation is inherently harmful: it is a cornerstone of the RIIO network regulatory regime. For each of these observations, the perception of the T-pylon will likely alter over time as the public becomes familiar with its scale and form. It is not persuasive to suggest that the simplicity of its form (a particular benefit of the T-pylon when compared to the lattice design) could be a detrimental attribute through its potential temporary effect on the perceived scale of a landscape (until the public are more familiar). IDPL and Ofgem may have opinions on the T-pylon. However it won a design competition and received endorsement from the Secretary of State as a '*striking and elegant design*' and as '*a graceful, refined structure fit for the needs of our low carbon, 21st century'.*

4.5 The fifth of the bullet points following the review of the viewpoints in the TNEI Report makes an observation that the T-pylons appear to more easily dwarf buildings when sited in relatively close proximity to them. It is not clear in what instance or instances this observation has been made. As previously referenced at paragraph 49 in Appendix B of the PDOR, the overhead line routeing has sought to maximise

separation from sensitive receptors such as dwellings on the grounds of amenity and there are relatively few instances along the route where the T-pylons would be seen close to buildings. It is acknowledged that the monopole design of the T-pylon means that it is slender at its base and broader at its top, compared with the standard lattice tower which occupies a greater footprint at its base, with six cross-arms, the largest of which are not as broad as the cross beam on the T-pylon. However, a standard lattice pylon (at a typical height of 46.5m) is significantly taller than the average two storey building, and 12m taller than a standard T-pylon. From the experience of visiting structures on site, the lower height of the T-pylon means that it is more human in scale. The monopole structure also has advantages in minimising footprint and visual clutter at ground-level.

4.6 The second to last bullet point makes the observation that *'removed lattice pylons would often already be quite recessive visually within the landscape except when the receptor is within close proximity to them'*. It is understood that this comment is referring to the lower height 132kV lattice pylons which support Western Power Distribution (WPD) overhead lines, some of which would be removed as part of the project's mitigation proposals. It is not clear why this point is being made when making observations about the differences between 400kV standard lattice pylons and the T-pylon. However, the lower height of these pylons (typically 24.2m or 26.4m in height) means that they are more visually recessive in the landscape where they are more readily screened by vegetation and built form. As noted in Table 6.5 of the ES Landscape Chapter the T-pylon '*has been selected particularly because its height is closer to the height of the supports on the existing line than other supports that could be used and will minimise overall landscape and visual effects'*.

4.7 The observations made by IDPL do not refer to the height of the T-pylon and the difference this would make in combination with localised screening effects and with distance. This is a key benefit of the T-pylon and it is not clear why this observation has not been made.

4.8 Zone of Theoretical Visibility (ZTV) mapping was prepared for both T-pylon and standard lattice pylons and included within the PEIR (Figures 7.1.1 to 7.1.4). This mapping was prepared in line with Scottish Natural Heritage (SNH) best practice guidance (as advised by the Landscape Institute, irrespective of whether developments are in Scotland) to inform the landscape and visual impact assessment which formed part of the PEIR, rather than to highlight any differences between the theoretical visibility of the sections of overhead line connection arising from the pylon designs. This mapping shows that the T-pylon is predicted to be less visible than the standard lattice pylon. This ZTV mapping incorporated the screening effect of woodland and buildings (using OS data sets available and with height assumptions of 8m for buildings and 10m for woodland), although it did not take account of the localised screening effects of vegetation or boundary treatments (such as hedgerows, individual trees, rows of trees, small tree groups, scrub, fences or walls).

4.9 IDPL's review in the TNEI report acknowledges that *'NGET has made a case for the visual benefits associated with use of the T-pylon and has communicated this through the assessment process and illustrated the benefits via visualisation material'*. Further to this IDPL concludes that its '*review of the materials suggests that NGET made a reasonable case that the deployment of T-pylons reduces the landscape and*

visual effects of the project. There are instances along the route where it could be argued that the use of lattice towers might be beneficial. However IDPL's review concurs with the landscape and visual assessment that has informed the design process in that multiple switches between the two pylon types would result in greater effects'. The TNEI report's summary at Table 3-3 also states that *'the decision overall that T-pylons would reduce impacts appears reasonable'.*

4.10 TEP agrees that alternating between the two pylon types would have resulted in greater landscape and visual effects. As previously explained where lattice pylons were originally proposed in Section A and the southernmost part of Section B, National Grid responded to consultation feedback on the PEIR and PDOR from statutory consultees, members of the community and wider consultation organisations by amending the proposed lattice pylons to T-pylons on this part of the connection.

5. Conclusion

5.1 The T-pylon came to be a possible option to support new overhead lines following a design competition sponsored by the government department responsible for consenting and managing networks. The design was introduced in 2013 by the Secretary of State as an appropriate and modern design for new overhead lines and it has been considered as an option in each consent application made since that time. TNEI acknowledges that it is '*impossible'* to demonstrate that consent would have been granted for a different application.

5.2 TNEI acknowledges that a proper and appropriate process was engaged by National Grid in its consent application and that engagement is important in that process. EN-1 and EN-5 state that technology and design options are to be considered when considering new connections. These options include the T-pylon as a design commended by government as appropriate and contemporary.

5.3 The consideration of possible effects of the T-pylon in the TNEI Report considered very few of the many viewpoints presented as part of the evidence for the HPCC application. No visit has been made to the T-pylons that have been installed to verify observations made. The T-pylon is new and unfamiliar to the public because it is innovative. However that was the case when it was endorsed by the government and innovation is a cornerstone of the RIIO regulatory regime. To seek to fault the T-pylon on that basis is very unpersuasive.

5.4 Evidence was presented on the effects of the T-pylon in the consent application, including Zones of Theoretical Visibility which tended to favour the T-pylon. During Examination of the application, a visit was made to the existing T-pylon overhead line to help to test those findings before consent was granted. TNEI has found that National Grid's position, as advised by TEP, that '*overall that T-pylons would reduce impacts appears reasonable'.*