Llandinam Wind Farm
Repowering and Extension

Session 1 - Local Issues

Proof of Evidence of David Tucker MSc, CEng, MICE, MIHT
on Matters of Traffic, Access and Transport

On Behalf of CeltPower Limited

Volume 1 - Text
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Appendix 1 Existing Traffic Patterns

Appendix 2 Highway Access Drawings

Appendix 3 Table 8.1 Assessment of Traffic Impact
1.0 QUALIFICATIONS AND EXPERIENCE

1.1 My name is David Anthony Tucker. I am a Chartered Engineer, being a Member of the Institution of Civil Engineers and the Institution of Highways and Transportation. I hold an Honours Degree in Civil Engineering and a Masters Degree in Highways and Traffic Engineering both from the University of Birmingham.

1.2 I have over 35 years experience in the planning, design and construction of a wide variety of projects in both the public and private sector, specialising in highway, traffic and transportation planning and design, including traffic and environmental impact studies.

1.3 I am a director of David Tucker Associates, Transport Planning Consultants. The consultancy specialises in expert advice on transport related matters throughout a broad range of projects for both the public and private sector. In particular, expertise lies in evolving transport strategies, identifying solutions and negotiating agreements.

1.4 I have extensive experience in the planning and delivery of major projects including wind energy parks, port development and logistic facilities. Schemes have included the production of land access strategies for a number of major projects including the development of Southampton and Bristol ports, the review and implementation of land access proposals for the London Gateway project and the implementation of abnormal load strategies for various sites.

1.5 I confirm that this evidence is true and has been prepared and is given in accordance with the guidance of my professional institutions. I also confirm that the opinions expressed are my true and professional opinions.
2.0 SCOPE AND NATURE OF EVIDENCE

2.1 This evidence has been prepared on behalf of CeltPower Limited to address the traffic, access and transport aspects of the proposed re-powering and extension of the Llandinam Wind Farm.

2.2 The Llandinam scheme (the Development) is one of a number of proposed wind farms in the mid Wales area but differs in that it is a re-powering scheme. The site is currently an active wind farm with a total of 102 turbines operating over 1,307 hectare site. The proposed re-development will occupy much of the same area, with some extension to the north east and reduction to the east, and will comprise 34 larger turbines. Full descriptions of the existing and proposed wind farm are given in the Environmental Statement (Original ES) and the Supplementary Environmental Information submitted in April 2013 (2013 SEI).

2.3 The principle traffic and transportation matters to be addressed relate to the engineering requirements and potential traffic impact of construction traffic. Once the site is constructed the long term operational phase of the development will generate only limited traffic flows which will generally be car and light vehicle traffic. The principle issues to address therefore surround the construction phase.

2.4 In January 2012 David Tucker Associates were commissioned to review the access strategy for the proposed re-powering. This fell into two elements:

i) Volume and impact of general construction traffic on the local road network;
ii) The establishment of an acceptable route for delivery of the wind turbines to the site.

2.5 DTA adopted a first-principles approach to establish the traffic generation from the Development as this depends on the particular characteristics of the site and the construction methodology to be adopted. As regards the delivery of the wind turbines to the site these are typically abnormal indivisible loads (AILs) which in simple terms are loads and vehicles which are larger or heavier than standard road going vehicles.
2.6 The starting point for DTA’s review was to reassess potential routes for the AILs from the port of entry into Wales to the site. In 2011 CeltPower had proposed utilising a route from Newport in South Wales via the Brecons and then for a short distance through Herefordshire and finally back into Powys for access to the site. These proposals were published in the Supplementary Environmental Information published in 2011 (2011 SEI). These proposals attracted objection from Herefordshire County Council particularly in relation to transporting the AILs through the village of Eardisley and there was also some concerns regarding clearances at the railway bridge in the settlement of Crossgates.

2.7 Following the review of the proposed route a revised southern transport route was developed which removed the sections of the AIL route proposed through Eardisley in Herefordshire and instead used a route via the A483 via Builth Wells in Powys.

2.8 DTA also reviewed the general construction methodology in consultation with the developers and established comprehensive estimates of likely construction traffic together with an indicative development programme.

2.9 In the light of the assessment of the requirements of the AILs and the general construction traffic, DTA reviewed the design of the access road from the A483 trunk road to the site and updated the design as necessary to address concerns expressed by Powys County Council (PCC) and Welsh Government Transport (WGT) regarding the ability of this route to accommodate the traffic flows and abnormal loads now forecast.

2.10 Full details of the assessments undertaken by DTA are contained in the draft Llandinam Wind Farm Transport Assessment (document no. CPL-TRA-003) which has been agreed with both WGT and PCC and is summarised in Section 9 of the 2013 SEI.

2.11 This evidence addresses the forecast generation of both general construction traffic and abnormal loads to the site together with the impact of that traffic on the local highway network. It also addresses the improvements proposed to the access road between the A483 trunk road and the site. The more general matters of the strategic access route for the wind turbines from the port of entry to the site and cumulative
impact of traffic generated by the Llandinam project with other proposed developments in the area will be dealt with in the evidence to Session 4 of the Inquiry.

2.12 This evidence concludes that the principle impact from the construction traffic, both general and abnormal loads (AILs), generated by the re-powering of the Llandinam Wind Farm site will be limited to the section of local road between the A483 trunk road and the site. The evidence also concludes that the proposed improvements to that highway will mitigate the impact and ensure that the site can be accessed in a safe and reliable manner without impact on the general travelling public. This position is agreed with the local highway authority Powys County Council and the arrangements for access onto the trunk road have been agreed with WGT.
3.0 POLICY CONTEXT

3.1 This section deals solely with the relevant transport policies. The more general policy context for the proposed development is contained in the evidence of Peter Frampton, the Original ES, the 2011 SEI and the 2013 SEI.

3.2 The Welsh Government (WG) set out its policy for the future of transport in Wales in “One Wales: Connecting the Nation - The Wales Transport Strategy” published in April 2008. This policy includes objectives such as reducing greenhouse gas emissions, reducing environmental impact from transport, integrating local transport, improving access between key settlements and sites, enhancing international connectivity and increasing safety and security. The delivery of the One Wales Strategy was to be achieved in partnership with the Regional Transport Consortium which each produces its own Regional Transport Plan (RTP). The Llandinam site falls within the Mid-Wales Transport Consortium (TTaCC) which produced its RTP in 2009. There are no specific transport-related policies that affect the Llandinam re-powering scheme.

3.3 The Welsh Government (WG) has issued a series of technical advice notes to support Planning Policy Wales. Technical Advice Note 18 (TAN18) deals with all matters relating to transport. TAN18 sets out how the transport elements of a development should be assessed although it makes no direct reference to the construction impact of development or to wind farm developments. However, the principles of TAN18 have been adopted in the development of the transport strategy for the Llandinam scheme.

3.4 Section 8 of the Powys UDP sets out the general position of transport and also reviews the highway improvement schemes in the county. It notes proposals for by-passes of both Newtown and Builth Wells. Since adoption of the Powys UDP proposals for a Newtown by-pass have proceeded with an ECI (Early Contractor Involvement) contractor being appointed earlier in the year. Draft orders are expected to be published in Spring 2014. However there is no completion date as yet for that scheme. The Builth Wells scheme is not as advanced as Newtown although it does have a safeguarded route within the Powys UDP. In summary the Powys UDP places no particular requirements on developers of wind farms in terms of transport requirements.
4.0  EXISTING CONDITIONS

4.1 The existing conditions on highways likely to be impacted by the proposed development are assessed in Section 2 of the Transport Assessment (TA). The key conclusions of the TA are set out below.

Existing Access

4.2 Existing access is currently via an unclassified road off the A483 trunk road. It is a rural single track road accessing the agricultural land surrounding the site and the associated dwelling. The road varies in width averaging about 4m with places to allow vehicles to pass. The road is lightly trafficked. The road provides operational access to the existing wind farm.

Local Road Access

4.3 Access to the area is via the A483 trunk road. It is a single carriageway road approximately 6.5m wide. The road is generally lightly trafficked and has no abnormal safety record.

Existing Traffic Patterns

4.4 Comprehensive traffic surveys have been undertaken to establish traffic volumes, vehicle classifications and speeds on key sections of the surrounding highway network. The results of these surveys are summarised in Table 2.1 and Figure 2.2 of the TA which are reproduced as Appendix 1 of this evidence.
5.0 TRIP GENERATION AND DISTRIBUTION

5.1 The current site has consent for its existing 102 turbines all of which need maintaining from time to time. Apart from this activity the site currently generates very little additional traffic; this can be taken as de minimis. It is expected that once the new site is fully operational traffic generation will again be de minimis.

5.2 The main impact will relate to the construction phase of the Development and therefore the likely levels of traffic have been estimated based on extensive discussions with the development team about the nature of each element of the works, its position in the construction programme and duration. This is a first-principles approach based on experience of construction of similar wind farms in a variety of other locations.

5.3 The approach taken focuses on peak daily construction traffic movements, explaining the nature of these movements by splitting broadly between the site personnel commuting in cars and vans, standard HGV deliveries and AIL movements. This is a more detailed approach than that which was undertaken in the Original ES and the 2011 SEI.

5.4 Section 7.2 of the TA goes through each stage of the process in some detail looking at both volumes of traffic and timing of movements. The results are summarised in Tables 7.1 and 7.2 of the TA which are included below as Tables 5.1 and 5.2 below.
### Table 5.1 – Daily Light Vehicle Trip Generation - Weekday

<table>
<thead>
<tr>
<th></th>
<th>Daily (0700-1900)</th>
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<tbody>
<tr>
<td></td>
<td>Arrivals</td>
<td>Departures</td>
</tr>
<tr>
<td>Workforce and visitors</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>95</td>
<td>95</td>
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### Table 5.2 – Daily HGV Trip Generation - Weekday

<table>
<thead>
<tr>
<th></th>
<th>Daily (0700-1900)</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Arrivals</td>
<td>Departures</td>
</tr>
<tr>
<td>Decommissioning</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Aggregates</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Cement</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sand, shingle, grit</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Steel reinforcement</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cabling/electrical</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Building materials</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Civils and drainage</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Sundries</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>31</td>
<td>31</td>
</tr>
</tbody>
</table>

5.5 The generated traffic has been distributed onto the surrounding road network as set out in *Tables 7.3* and *7.4* of the TA which are again included below as *Tables 5.3* and *5.4* below.

### Table 5.3 – Distribution of Daily Light Vehicle Movements - Weekday

<table>
<thead>
<tr>
<th></th>
<th>Daily two-way movements</th>
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<tbody>
<tr>
<td></td>
<td>A470 West</td>
<td>A483 North</td>
</tr>
<tr>
<td>Workforce</td>
<td>47</td>
<td>95</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>47</td>
<td>95</td>
</tr>
</tbody>
</table>
Table 5.4 – Distribution of Daily HGV Trip Generation - Weekday

<table>
<thead>
<tr>
<th></th>
<th>Daily two-way movements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A470 West</td>
</tr>
<tr>
<td>Decommissioning</td>
<td>-</td>
</tr>
<tr>
<td>Aggregates</td>
<td>7</td>
</tr>
<tr>
<td>Cement</td>
<td>-</td>
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<tr>
<td>Sand, shingle, grit</td>
<td>2</td>
</tr>
<tr>
<td>Steel reinforcement</td>
<td>-</td>
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<tr>
<td>Cabling/electrical</td>
<td>-</td>
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<tr>
<td>Building materials</td>
<td>-</td>
</tr>
<tr>
<td>Civils and drainage</td>
<td>-</td>
</tr>
<tr>
<td>Sundries</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

5.6 The abnormal load convoys (AILs) are not included in the traffic generation for the site because:

- They require separate approval before moving on the highway;
- They will not occur more than once per day or three times a week;
- They require traffic management by Police officers.

For these reasons they are considered to be discrete events on the highway rather than being inter-mingled with general traffic.

5.7 The make-up of each convoy is yet to be determined but it is likely the convoys will comprise two AIL vehicles initially until drivers and Police officers gain experience of the management of the route. It may be possible to increase the number of vehicles in each convoy once the team gain experience of the route. Each convoy will be accompanied by a number of Police officers who will be deployed to marshal the general traffic along the route. In general there will be eight AIL movements per turbine.
6.0 PROPOSED ACCESS STRATEGY

6.1 In essence the construction activities involve the decommissioning of the existing site and then the preparation of the new site and erection of the turbines and associated equipment. This will require the dismantling and removal of the existing turbines, the upgrading of the existing hard standings and access track to allow crane access during dismantling and reconstruction, the construction of new turbine bases and the erection of the turbines themselves. To carry out these activities will require an access to the site which can accommodate standard HGVs together with the Abnormal Load Convoy (AIL’s) required to transport the new wind turbine components. The decommissioned turbines will be removed by standard HGVs.

Local Access

6.2 The access road to the site from the A483 will be upgraded to accommodate the construction traffic and the abnormal load deliveries. Details of the access proposals are contained in section 7 of the proof.

AIL Deliveries

6.3 Away from the direct access to the site from the A483 it will be necessary to carry out some additional highway improvements to accommodate the delivery of the wind turbines components from the port of entry. This route will be the subject of a Traffic Management Plan (TMP) to be agreed with both WGT and Powys County Council. This will be the subject of further analysis in Session 4 of the Inquiry.

6.4 A Strategic Traffic Management Plan (sTMP) for delivery of wind farm components generally into Mid-Wales is currently being finalised in response to potential cumulative effects of transporting abnormal loads emerging from the bottlenecking of projects dependant on the Mid-Wales grid connection project. Scottish Power Renewables (SPR) is a founding and funding member of the sTMP group and, as one half of the Applicants (CeltPower Ltd), supports the sTMP initiative. Indeed SPR relies upon the sTMP and the mid Wales grid connection project for its Dyfnant windfarm development project. However the Llandinam repowering project has never been seen as a
candidate project for the sTMP due to its earlier delivery and therefore lack of cumulative effects.

6.5 At this time, and in any event, there remains uncertainty over both the timescale for concluding all elements of the sTMP and the mechanisms for delivery of shared works. There is also a possibility that full access to Strategic Search Area (SSA) C using the sTMP will be tied to and reliant on the prior construction of a Newtown bypass. That project is currently undergoing detailed design but with no certain delivery date.

6.6 It is anticipated that the programme for delivery of the sTMP will be consistent with the projected build programmes for the majority of the wind farm proposals in Mid-Wales as these are dependent on the Mid-Wales grid project becoming available. However in the case of Llandinam, in the light of the forecast timescales for site preparation and grid connection, any requirement, as has been suggested, to use the sTMP would lead to a significant delay in the Llandinam repowering project. This in turn would create unnecessarily delay in bringing this existing facility back on stream as a modern and efficient power generator.

6.7 Studies have therefore been carried out to identify potential routes for delivering turbine components to the site in the absence of the sTMP. These are reported in the 2013 SEI. Several alternative routes around Newtown were investigated but all practical routes were in effect variations of the sTMP and suffered the same timing constraints. However the studies identified that, with some temporary works, a route from the south was readily available. Initially it was considered that the best route was from Newport via the Brecons, Eardisley in Herefordshire and Crossgates. However following consultation with key stakeholders it was concluded that any route through Eardisley would cause impact on the village requiring further mitigation. The studies therefore concluded that the optimum route was from Newport via the Brecons, Builth Wells, Llandrindod Wells and Crossgates. This is the route now proposed.

6.8 The proposed route will see the abnormal loads brought from the Port of Newport via the M4 to Junction 32 to join the A470 northwards across the Brecons and up to the Brecon Bypass. There will then be a short section along the A438 and A479 before re-
joining the A470 to Builth Wells. It is proposed to bypass the current Builth Wells bridge across the River Wye with a temporary river crossing to the south east of Builth Wells. After Builth Wells the abnormal load route will continue on the A483 through Llandrindod Wells and Crossgates up to the site access.

6.9 The management of the southern route will adopt the same principles as the sTMP and in particular addresses:

- the sizes of turbine components and the organisation of the AILs into convoys;
- the general principles of managing the convoys and the estimation of delays they cause to other traffic;
- the highway works needed to physically accommodate the AILs on the highway;
- the preferred route proposed for the convoys;
- detailed step-by-step management of the convoys; and
- the timetable for progress of the convoys along the route.

6.10 The overriding priority is to provide safe passage for all vehicles along the route whilst minimising and limiting delays to other traffic caused by the AIL convoys to 10 minutes, as has been deemed acceptable in the sTMP. The route is 101 miles long and each convoy takes approximately 5.5 hours to complete it. This will require a high degree of management and coordination with the police who are actively involved in development of the proposals.

6.11 Two key innovations along the route are proposed as set out in the SEI 2013. These are:-

- Use of a temporary bridge crossing of the River Wye to enable a route avoiding a difficult turn onto the River Wye bridge in Builth Wells;
- The modification of a section of carriageway at Crossgates railway bridge to address the existing substandard headroom.
6.12 Discussions on the detail are ongoing with both Powys County Council (PCC) and Welsh Government Transport (WGT). These discussions will be reported upon in Session 4. These discussions relate mostly to matters of detail regarding locations on the route where other traffic can overtake the convoys or needs to be held while the convoy passes. Construction details for local strengthening of the highway verges and methodologies for dismantling and re-erecting street furniture such as signs are also being agreed.

**General Construction Management**

6.13 In addition to the highway improvements there will be an Access Management Plan. This will include a Traffic Management Plan, setting out a Travel Plan to be implemented to minimise the number of vehicles transporting workers to and from the site, and a Construction Management Plan and Lorry Routing Strategy for all non AIL construction traffic. The principles of these plans are set out in the TA. These plans will be subject to appropriate planning conditions.
7.0 SITE ACCESS

7.1 A scheme has been developed for the widening of the local road between the A483 and the site access. The carriageway along this route is currently on average 4m wide and comprises single track route with passing places. It is proposed to widen this route to a basic standard of 4m throughout with widening as necessary on bends. This does require some modification and re-alignment to the existing highway. In addition, passing bays will be provided at appropriate locations along the route.

7.2 There have been extensive discussions with Powys County Council (PCC) on the design of these access improvements and it is proposed that they will be improved under a Section 278 Agreement. The drawings of the proposed scheme are appended at Appendix 2.
8.0 TRAFFIC IMPACT

8.1 The traffic impact of the proposals on the surrounding road network has been assessed in Section 8 of the TA. In general existing baseline traffic data has been factored to a common commencement year of 2015 using standard conversion factors. The future traffic forecast to be generated by the proposed construction phase of the development has been added to the baseline flows to produce future traffic flows. These flows are shown in Table 8.3 of the TA and reproduced as Table 8.1 attached at Appendix 3.

8.2 These figures have been used as the basis for the assessment of predicted increases and annual average daily traffic contained in Table 9.3 of the Supplementary Environmental Information of April 2013. In terms of the operational effect of any increases in traffic flow an assessment has been carried out in accordance with TAN18. The general principal of TAN18 is that material impact is identified as an increase of more than 10% on existing two-way traffic flows on adjoining highway network or 5% where existing congestion occurs or will occur within the assessment period.

8.3 Table 8.1 in Appendix 3 shows that the general levels of increase are less than 5% at all but one location (A483 south of Newtown) where it is 6%. For HGVs increases are generally less than 5% and only exceed 10% at five locations where in any event background flows are low. Furthermore, these increases are temporary in nature and as such would normally be unlikely to warrant any permanent highway improvements. It is therefore considered in this case that the general levels of traffic increase on the network do not warrant a closer examination of the effects on local junctions.
9.0 SUMMARY AND CONCLUSION

9.1 This evidence has been prepared on behalf of CeltPower Limited to address the traffic, access and transport aspects of the proposed re-powering and extension of the Llandinam Wind Farm both in so far as they arise in Session 1 and in order to provide context to the material to be dealt with in more detail in Session 4. In particular this evidence has reviewed the existing conditions on the surrounding network, the forecast trip generation and distribution of traffic from the site, the proposed access strategy and the resultant traffic impact of the proposals.

9.2 This evidence has concentrated on the Local Access issues to be addressed in Session 1. Further evidence will be presented for Session 4 on strategic traffic issues including the cumulative impact with other sites and the strategy for delivery of Turbine components from the Port of Entry to the site.

9.3 This evidence has primarily addressed the traffic and transportation matters related to the engineering requirements and potential traffic impact of construction traffic. Once the site is constructed the long term operational phase of the development will generate only limited traffic flows which will generally be car and light vehicle traffic. The assessments carried out, and relied upon in this evidence, have adopted the principles set out in Welsh Government’s Planning Policy Technical Advice Note 18 (TAN18). Full details of the assessments are contained in the Llandinam Wind Farm Transport Assessment.

9.4 This evidence has set out the proposed improvements to the local access road between the A483 Trunk Road and the site which have been agreed with both the local highway authority (Powys County Council) and the Trunk Road authority (Welsh Government Transport). The proposed works will be carried out under a S278 Agreement.

9.5 This evidence has summarised the potential impact of traffic from the proposals on the surrounding road network and has established that the impact is generally less than 5% and only exceeds 10% for HGVs at five locations where background flows are low.
Furthermore these increases are temporary in nature and as such would not warrant any permanent highway improvements under the TAN18 guidance.

9.6 On the basis of this evidence there is no case to refuse this application on traffic, access or transport grounds.