

**MEETING No 4  
REPORT**

**Kyoto Energy Park  
Kyoto Community Forum**

**Location:** Upper Hunter Shire Council Offices

**Date:** 22 September 2015

**Time:** 2:30pm

**Attendees and Distribution:**

Chair	Daryl Dutton	(apology)
Local Residents	Judy Wheeler	
	Gordon Halliday	
	Trevor Woolley	(apology)
Upper Hunter Shire Council	Cr. Wayne Bedggood	
	Sean Constable	(apology)
Chamber of Commerce	Peter Hale	(apology)
Proponent	Mark Sydney	
	Mark Dixon	

**Observers**

Office of Heritage	Gordon Fraser
Upper Hunter Shire Council	Matt Pringle

**Copies sent to:**

Project Website  
Department of Planning (Bridge St)  
Department of Planning (Compliance)

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
<b>1. Apologies / Structure</b>		
• New Resident Members	Mr Gordon Halliday and Mr Trevor Woolley are welcomed as new Resident Members of the Kyoto Community Forum. Unfortunately Mr Woolley sends his apology for this first meeting as he will be inter-state.	Noted
• Apologies	Sean Constable Daryl Dutton Peter Hale Trevor Woolley	
<b>2. Declarations of Interests</b>		
Anything to declare?	KCF	Nothing to declare
<b>3. Confirmation of previous Minutes</b>		
3.1. Minutes of Meeting No.3	KCF	Accepted
<b>4. Actions Arising from last meeting (Meeting No. 3)</b>		
4.1. Pamada to re-run an ad for public nominations. It was agreed to re-run the ad in both Scone &	Complete.	Noted

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
Muswellbrook papers.		
4.2. Two weeks before the meeting any questions need to go to Chair and any agenda points for discussion.	Items raised by Judy Wheeler and Sean Constable are addressed in this report.	Noted
4.3. Pamada will put minutes and in general update the project website. (as well as Pamada's own site)	Pamada website update is complete. Kyoto website continues to be updated with news however a major overhaul has been postponed for a short time. It is now hoped that the website will be refreshed over the Christmas break.	Noted. Judy Wheeler did say that website is cluttered with unnecessary links and information especially on home page making it difficult to navigate to Kyoto information. <b>Action: Pamada to consider in redesign</b>
4.4. Stage One Map to be clearly outlined on the website with a map.	Complete.	
4.5. Pamada's personnel to be updated. (on Pamada website)	Complete.	
4.6. It would be good to have a slide show of wind farm 101. Ms Wheeler will send a sheet Frequently Asked Questions.	A video showing all of the construction activity that goes into the construction of a turbine was added to the website. This was seen as a more productive way of giving people an insight into the steps.	<b>Action: Gordon Fraser offered to provide some links to websites with additional information on turbine technology and construction techniques.</b>
4.7. Site layout Middlebrook Station.	The diagram from the application for approval is attached to this report as well as Google Earth view of the site showing the turbines and the properties of Middlebrook Station and Ms Wheeler residence.	Noted
4.8. Moobi Foundation	A presentation at the meeting will be made in regard to the Moobi Foundation (the fund created by Kyoto Energy Park to deliver funding into the community.)	Mark Sydney made a presentation of Mt Moobi Foundation Charter (see attached) which was generally well accepted by Forum. Some constructive points for consideration from various members was noted in following sections and Pamada has agreed to take these on board.
<b>5. Correspondence</b>		
5.1. General Public – Generally	Nothing to report	Noted
5.2. General Public - Work	The Hunter Business Review is running a further update in its next issue.  A few requests for information pertaining to work opportunities with the project – primarily in civil construction.	Noted
5.3. General Public – KCF	Formal requests to join as community members for the Kyoto Community Forum were received and agreed to for Gordon Halliday	After much discussion Pamada confirmed it would be open to a newsletter drop within the vicinity of the project site and will consult with

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
	and Trevor Woolley.	the Forum prior to the sending out of the Newsletter.
5.4. Government Generally	No correspondence	
5.5. KCF Committee Members	A few emails copied into all mainly regarding new KCF Community Membership. Note from Sean Constable regarding lighting for aviation purposes.	A request from Sean Constable (UHSC) was received in relation to possible lighting treatment of turbines at night and associated impacts. In addition since approval in 2010 Scone airport has now been classified as a 'scheduled airport' with general queries raised for any additional lighting requirements that may be applicable as a result of the change. Note: Addressed in Section 6. Turbine Lighting and attached-CASA design overlay.
5.6. Department of Planning and Environment – community committee	Nothing to report	Pamada send out additional information on project update and status in the coming months to residents in the vicinity of the site. Ms Wheeler also noted that regular quarterly meetings are held between residents whereby Judy is able to brief residents on KEP status.
5.7. Department of Planning and Environment – compliance and audit	Nothing to report	
5.8. Press – Communications	No correspondence other than the ads for community members and upcoming mention in the Hunter Business Review.	Noted
5.9. Press – General	None noted by the proponent	Noted
5.10. Website	Kyoto website continues to be updated with news however a major overhaul has been postponed for a short time. It is now hoped that the website will be refreshed over the Christmas break. With the website update there will be a twitter account to help bring traffic to the website (and eventually a Facebook page).	
<b>6. Project Report</b>		
6.1. Progress of the project – assessment or operational issues		
<ul style="list-style-type: none"> <li>Generally</li> </ul>	In general terms since the last KCF meeting the project's focus has been:	1. Stage 1 CEMP documents have now been submitted to the DPE as at September 2015. Pamada are currently awaiting feedback from

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
	<ol style="list-style-type: none"> <li>1. Finalisation of the Stage 1 documents (CEMP etc) for the Department of Planning;</li> <li>2. Identification of probable financial partners to bring the project to reality; and</li> <li>3. Preparation of a submission to the ACT Government for the sale of power from the Kyoto Energy Park.</li> </ol> <p><i>Further discussion was presented at the meeting.</i></p>	<p>DPE. Stage 1 seeks approval to construct the 'early works' components adjacent to the Bunnan Rd entrance. These works comprise Site Office/Laydown area/ Access Road and fencing. These works are considered very minor in nature, with approval from DPE necessary to allow early access pending construction commencement.</p> <p>2. Mr Sydney said that Pamada were working on ACT bid with ability to submit bid for up to 100MW of wind capacity. Lodgement due mid Oct 2015.</p> <p>Gordon Fraser explained concept of NEM electricity pool and contracts for retail supply of electricity. The ACT auction would not affect overall benefit to Scone community from windfarm supply to local grid in a physical sense. The ACT government are effectively tendering for offsetting of its own carbon emissions generated within the ACT borders by offsetting against other renewable energy generation in the state.</p>
<ul style="list-style-type: none"> <li>• General Industry Issues /</li> <li>• Macro-Economic Environment</li> </ul>	<p>[Repeat]</p> <p>With the dual impact of wholesale power prices rising and investor interest, it has meant a favourable outlook for both bank debt and equity investors exist more promisingly than for many years.</p> <p>Renewable Energy is globally seen as one of the more stable and reliable forms of investment.</p> <p>With the increased certainty, the availability of finance and technology solutions have increased greatly.</p> <p><i>Further insight will be offered at the meeting.</i></p>	<p>Pamada are currently talking with various turbine suppliers in general technology improves with time including efficiency of the machine, interaction with the grid and environmental performance.</p>
<ul style="list-style-type: none"> <li>• Specific Project Related</li> </ul>	<p>Conditions of Planning Approval have been progressed since the last meeting. The Department are reviewing the updated documents. Essentially the submitted documents related to the</p>	<p>Noted and as discussed.</p>

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
	reformatted previously submitted documents (such as CEMP).	
<ul style="list-style-type: none"> <li>Technology Supplies</li> </ul>	<p>Since the last meeting new turbines for the specific wind regime at Scone have been made more available. On further review, it remains more likely that not the full 31 turbines at Mountain Station will eventuate. Turbines with a similar tip height but with larger spacing between them are likely.</p>	<p>Final turbine selection, numbers and micro-siting will occur during final design stages of the project. Based on previous preliminary turbine yield studies we envisage up 31 turbines are likely on Mountain Station.</p>
<ul style="list-style-type: none"> <li>Finance Availability</li> </ul>	<p>Even more access to project finance exists compared to the comments from the last meeting.</p> <p>At least two major banks in Australia are offering project finance based on spot pricing alone providing projects such as Kyoto Energy Park access to funding solutions even in the absence of a PPA.</p> <p>A further update will be provided at the meeting.</p>	<p>MS explained that while funding was difficult in the current renewable energy environment and particularly in the past, the future outlook is more promising. The new coalition government has announced that it will maintain the RET target which provides some confidence in the market.</p>
6.2. Issues arising from site inspections	Nothing to report	NA
6.3. Monitoring and performance	Nothing to report at this time	NA
6.4. Community complaints and response	None received to the project	NA
6.5. Information provided to the community and any feedback	As noted above, to all of the communiqués, no enquirees other than from Ms Wheeler.	NA
6.6. Other relevant Information	Nothing to report	NA
<b>4. General Business / Other</b>		
<ul style="list-style-type: none"> <li>Presentation on the Moobi Foundation</li> </ul>	<p>A brief presentation will be made at the meeting regarding progress of the Foundation. (Community Benefit Fund)</p>	<p>Initial comments were received from the forum members on the draft 'Moobi Foundation Charter Summary which was presented by MS, some general comments were:</p> <ul style="list-style-type: none"> <li>- Keeping 'Community funds' separate from any funds used by Pamada or landowner enterprises</li> <li>- Funds are not to displace infrastructure project levies (eg Council works) typically used for such works as road upgrades etc.</li> <li>-Funds to remain Community targeted and administered by Community representatives</li> </ul>

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
<b>5. Next Meeting</b>		
Suggested Thursday February 4 <sup>th</sup> , 2016 at 2.30pm?		Noted
<b>6. Other General Tracking Items</b>		
We have simplified the standing questions and thought a tracking each meeting may assist	[remains repeated unless in bold]	
<ul style="list-style-type: none"> <li>The position of the sub station</li> </ul>	Still likely near Moobi Plateau, well away from Bunnan Rd.	Noted
<ul style="list-style-type: none"> <li>3 turbines on Middlebrook</li> </ul>	No new update in this regard	Noted
<ul style="list-style-type: none"> <li>3 turbines on Middlebrook (power lines)</li> </ul>	No new update in this regard	Noted
<ul style="list-style-type: none"> <li>Power route generally</li> </ul>	Unfortunately the route remains confidential and will unlikely be public information for some months.	Noted
<ul style="list-style-type: none"> <li>Transport route for heavy vehicles and machinery</li> </ul>	No new update in this regard	Noted
<ul style="list-style-type: none"> <li>Road dilapidation Surveys</li> </ul>	Relevant Dilapidation Surveys will occur prior to relevant stages of construction.	Noted
<ul style="list-style-type: none"> <li><b>Turbine lighting:</b></li> </ul>	<b>Consultation is ongoing, however, final advice relating to the wind turbines relates to Stage 4. Our clear preference is for no lighting and we understand as a non-scheduled airport, it is not required. We will investigate whether a 'managed lighting' regime might be acceptable and as soon as possible consult with Sean Constable and the airport.</b>	Information is presented as attached. Changes to design considerations are effectively covered for in the conditions of consent as final lighting design needs to be approved by Aviation authorities (Air Services Australia and CASA) and signed off by DPE BEFORE construction of turbines. Turbine Lighting Design would be undertaken by a specialist turbine lighting consultant at the design stages in accordance with these Aviation Authorities. A CASA guideline is attached which shows potential mitigation techniques that may be considered during the design phase. Pamada is to follow up with Sean Constable and report at the next meeting.
<ul style="list-style-type: none"> <li>Bird &amp; Bat Monitoring – Condition 3.3.</li> </ul>	The approval of the Plan is ongoing and not final at the time of writing. The Plan, once approved, shall be placed on the website.	NA
<ul style="list-style-type: none"> <li>Flora &amp; Fauna Impacts: Condition 2.18. Has the compensatory habitat package been agreed</li> </ul>	The approval of the Plan is ongoing and not final at the time of writing. The Plan, once approved, shall be placed on the website.	NA
<ul style="list-style-type: none"> <li>Turbines on Mountain</li> </ul>	It is likely that the total number of	Noted

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
Station:	turbines reduce, but not certain at this time.  Should the number reduce, it is highly likely, distances from neighbours will remain generally similar, but more than likely they will be slightly further away.	
<ul style="list-style-type: none"> <li>Solar or Turbines first? If you decide to put the solar in first (and I hope you do) then this again could mean different turbine technology when the time comes.</li> </ul>	Even if solar is first, which is possible, it is highly unlikely to have an impact on the wind turbine technology. <b>Discussions with all finance partners share the hope to undertake the solar and wind simultaneously.</b>	Noted
<ul style="list-style-type: none"> <li>In relation to the various stages of construction and to be fair considering the financial situation, the RET etc. if you don't want to put a definite date on each stage then I guess that would be OK. Perhaps an indicative date. It can always be updated later. I guess the most important thing is to get the above answers to the questions covered and the general plan as to what each stage would comprise of.</li> </ul>	<b>Stage 1 Q1, Q2 2016</b>  <b>Stage 2 (Sub) linked to Stage 4</b>  <b>Stage 3 (Solar) hopefully Q3 2016</b>  <b>Stage 4 (Wind) hopefully Q3 2016 start</b>	Noted
<ul style="list-style-type: none"> <li>Further KCF members.</li> </ul>	<b>Noted earlier.</b>	Noted
<ul style="list-style-type: none"> <li>It is noted that the construction of the hydro component of the KEP and the manager's residence has not been mentioned in the 4 construction stages. Please advise if these are going ahead and at what stage they intend to be constructed.</li> </ul>	You are correct and this is being corrected. Both are likely Stage 4 works.	Noted
<ul style="list-style-type: none"> <li>Inspection of Mountain Station</li> </ul>	Agreed, it would be more beneficial after completion of Stage 1 and Pamada to arrange at that time.	Noted
<ul style="list-style-type: none"> <li>Website</li> </ul>	Part of full rebuild	Noted
<ul style="list-style-type: none"> <li>Solar Update</li> </ul>	We are looking at all options with regard – existing location, modified location, and additional locations	Noted

Meeting / Report Items	Comment from KEP	Actions arising from Meeting No.4 / Comment from KCF
	<p>We hope to know before the next meeting and at the time of writing the existing proposed location and 10MW is likely.</p> <p>We will likely stage the solar with the 10MW first and further capacity soon thereafter.</p>	
<ul style="list-style-type: none"> <li>Compliance Tracking</li> </ul>	The Compliance Tracking Program and structure should be finalised by the next KCF meeting in February 2016.	Noted
<b>Other Issues discussed</b>		
<b>Community update</b>	<b>For residents within proximity to the KEP turbine component</b>	Mr Halliday Ms Wheeler noted it had been some time since residents surrounding the KEP had been updated on progress to date. Requested that an update be sent to residents within 3km of turbine radius. Ms Wheeler suggested contact list was outdated and some individual residents did not receive previous updates. Options exist for 'Community Update' to be sent, via Council to residents or for Pamada to obtain contact list from Council.



**Appendix 1: Copy of Moobi Foundation Information Summary**

# Moobi Foundation



## Information Summary

## 1 INTRODUCTION and BACKGROUND

### 1.1 Background

The NSW Government, through consideration of the application for the project, agreed a foundation would be a positive approach to sharing with the local community, not only the environmental benefits, but the social, economic and cultural benefits, in a structured way.

The Moobi Foundation's core areas of interest are:

- Education;
- Health and Well Being;
- Community and Culture ;
- Environment ; and
- Growing and/or making businesses more competitive in the Community.

All programmes supported by the Moobi Foundation are seen as supplementing, not replacing existing programmes available. It is intended the programmes focus on supporting individuals, groups and businesses of the locality focused around the Scone Township.

Funding from the Kyoto Energy Park is designed to grow with the cost of living for the life of the project. The decisions regarding funding choices are to be managed and determined by the project, with ongoing peer review by a highly regarded local independent panel of citizens. The Upper Hunter Shire Council are to provide administrative transparency for the Moobi Foundation by administering the bank account directed by Kyoto Energy Park Management Team.

### 1.2 Statutory Framework

The Moobi Foundation arose from the commitment made by Pamada and subsequently as a result of a Condition of Approval issued by the Minister of Planning for NSW on 31 January 2010. This Charter establishes the commitment, framework and process of the Foundation, which is to commence at the operation of the Kyoto Energy Park.

## 2 AREAS OF SUPPORT

### 2.1 Generally

The Foundation may allocate funding to any area that is deemed to be best suited for the promotion of the objectives of the Moobi Foundation Charter.

At its core, the Kyoto Energy Park seeks to send a positive message and be an enterprise that demonstrates ecological, financial and social sustainability.

### 2.2 Areas of Interest

Funding each year must be allocated to the broad categories as set out below. Some discretion is acceptable should a programme or request be presented to Kyoto Energy Park that would fit the broad objectives of this Charter, yet not be noted below.

The funding each year cannot exceed the agreed budget, however, any funds in surplus from one year to the next, may be added to the budget for subsequent years.

Categories of funding are, with possible examples are:

#### 2.2.1 Generally

- The benefits of renewable energy as a pillar to a more sustainable means for living and a cleaner environment, not just for our communities but for our flora and fauna as co-beneficiaries of the environment.
- A means of communicating positive impacts of renewable energy to the Government, businesses and the community.

#### 2.2.2 Education

- Bursaries, Scholarships, Apprenticeships, Internships and Mentoring Programmes;
- Funding of educational material regarding renewable energy, energy, agricultural life, indigenous heritage in the area or on the site;
- Programmes to enhance skills;
- Funding support to tertiary educational facilities in support of their renewable energy programmes;
- Funding of educational excursions (including transport, accommodation, travel expenses, food, etc.);
- Funding of community support groups excursions (including transport, accommodation, travel expenses, insurance, etc.); and
- Support for teaching programmes about renewable energy.

#### 2.2.3 Health and Well Being

- Supervised walking and/or jogging around the site of the energy park (including insurance and 'group trainer');
- Support of local sporting teams;
- Arranging for organized talks and/or tours to the site for those not normally able to leave a place of care (ie sick kids, elderly....);
- Contributions towards sporting and health equipment; and
- Long term monitoring of the impacts of all energy generation on the local communities.

#### 2.2.4 Community, Regional Support and Culture

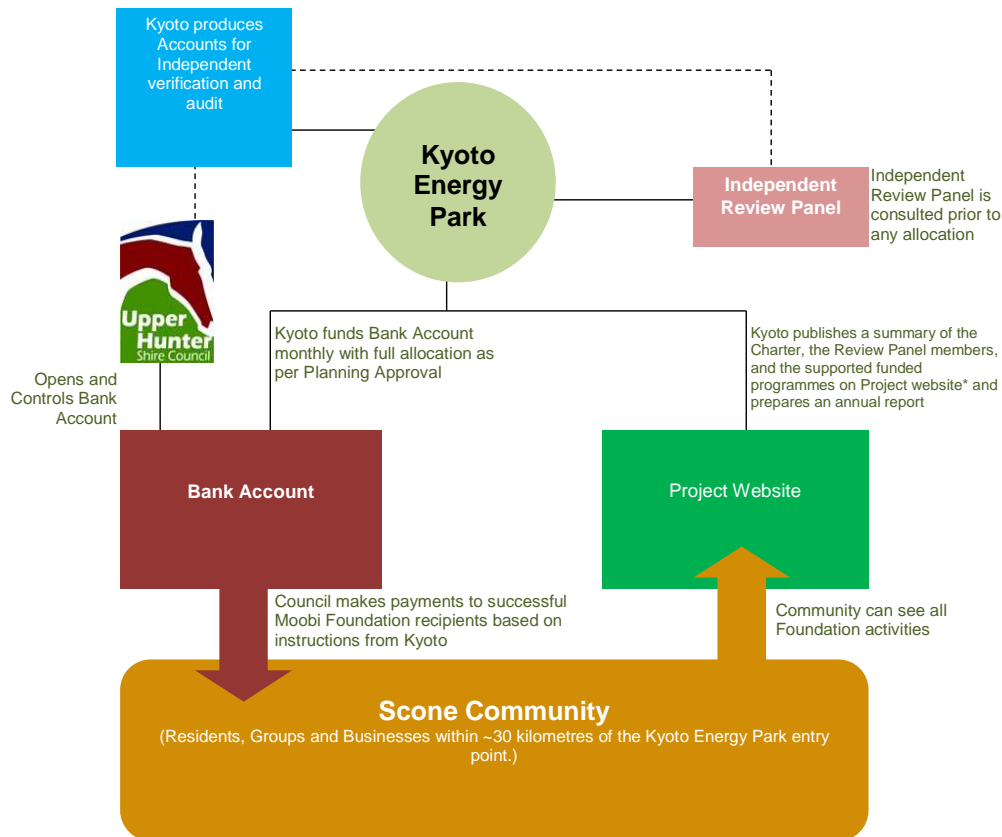
- Improvements to community infrastructure and services;
- Sustainability initiatives;
- Opportunities for local economic and tourist development; and
- Recognition of Aboriginal custodianship of the region.

#### 2.2.5 Environment

- Long term monitoring of the impacts of all energy generation on the local landscape, flora and fauna; and
- Further research into the benefits of renewable energy.

#### 2.2.6 Supporting Businesses in the Community

- Support local contractors in the construction and operation of the Energy Park (should the skills and terms be available and acceptable);
- A program that supports local businesses to implement energy savings/clean energy production for their business; and
- Transport, accommodation, travelling expenses, insurances and the like for groups to view the renewable energy assets.



### 3 FINANCIAL MATTERS

#### 3.1 Budget for the running of the Foundation

The funding required by the Conditions of Approval to be provided by Kyoto Energy Park is \$86,700 indexed to CPI and is based on the CPI calculation date starting June Quarter 2009. As at the date of initial presentation of this Charter, the indexed sum was approximately \$98,800 and growing.

Kyoto Energy will automatically adjust the contribution on each anniversary of the first payment into the Foundation Trust Account.

Each quarter Kyoto Energy shall send to an account controlled by the Upper Hunter Shire Council one quarter of the agreed quantum for the year. As funding programmes are approved and subject to available funds in the account, Council will remit to the beneficiary such funds agreed to be funded.

#### 3.2 Kyoto Energy Park

Upon commencement of operation of the Kyoto Energy Park, the Kyoto Energy Park will:

1. Establish and keep involved an independent Review Panel;
2. Provide funding in accordance with the Conditions of Approval and the Moobi Foundation Charter;
3. Establish template documentation for applications for funding;
4. Prepare an annual report of the activities of the Foundation and place it on the project website and make the accounts available to Upper Hunter Shire Council and the Independent Review Panel members; and
5. Make documentation for applications available from the project website.

### 4 COMMENCEMENT

This Charter is established on the date of this document, however, funding commences once the Kyoto Energy Park commences operations. The Management Team and Review Panel will commence with accepting applications for funding once construction of the wind farm stage has commenced.

### 5 PR AND COMMUNICATION

#### 5.1 Communication

Kyoto Energy will arrange for all public communication regarding the Foundation and its programmes. Prior to any communication, Kyoto Energy will inform the Review Panel and the Upper Hunter Shire Council. Kyoto Energy to also keep informed the Kyoto Community Forum.

#### 5.2 Website

Subject to confidentiality of any particular programme, all applications for funding that are approved are to be noted on the Kyoto Energy Park website. Similarly, subject to confidentiality, the Annual report shall be placed on the Kyoto Energy Park website.

**Appendix 2: General guidelines for Turbine Hazard Lighting CASA.**

# DRAFT

# Advisory Circular

AC 139-18(0)

DECEMBER 2005

## OBSTACLE MARKING AND LIGHTING OF WIND FARMS

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### 1. REFERENCES

- [CASR Part 139, Subpart 139.E](#)
- [Manual of Standards Part 139](#)

### 2. PURPOSE

- Wind turbines can be hazardous objects to aviation.
- This Advisory Circular (AC) provides general information and advice to:
- proponents of wind farms (including single wind turbines), and
  - planning authorities with jurisdiction over the approval of such structures.
- This AC also provides specific advice on measures to reduce the hazard, and how to implement them.

### 3. STATUS OF THIS AC

This is the first AC to be issued on this subject.

*Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.*

*Where an AC is referred to in a 'Note' below the regulation, the AC remains as guidance material.*

*ACs should always be read in conjunction with the referenced regulations*

#### **4. BACKGROUND**

**4.1** This AC applies to:

- (a) A single wind turbine, or
- (b) A group of wind turbines, referred to as a wind farm, which may be spread over a relatively large area.

**4.2** The height of a wind turbine is defined to be the maximum height reached by the tip of the turbine blades.

**4.3** Wind turbines pose a particular practical problem in that their highest point is not a fixed structure, and therefore obstacle lights can not be appropriately located. The highest fixed part of the turbine where lights can conveniently be located is the top of the generator housing, also known as the nacelle, and this is typically of the order of 2/3 the maximum height of the turbine.

#### **5. NOTIFYING CASA OF A WIND FARM PROPOSAL**

**5.1** Under the Civil Aviation Safety Regulations CASR Part 139, the Civil Aviation Safety Authority (CASA) must be notified:

- (a) by an aerodrome operator, if it becomes aware of any development or proposed construction near the aerodrome that is likely to create an obstacle, or if an object will infringe the obstacle limitation surfaces (OLS) of an aerodrome; or
- (b) by a person who proposes to construct a building or structure the top of which will be 110 metres or more above ground level.

*Note: Obstacle limitation surfaces are a complex of imaginary surfaces associated with an aerodrome. They vary depending on number and orientation of runways, and the instrument-approach type of the runway(s). Some surfaces can extend to 15 km from an aerodrome. Aerodrome operators can provide details for their particular aerodrome.*

**5.2** An individual wind turbine, or a wind farm where any turbine in the group meets these criteria, must be notified to CASA.

**5.3** Where a wind turbine or a wind farm is proposed to be located in the vicinity of an aerodrome (within 15 km), the proponent of the project should contact the relevant aerodrome operator in the first instance, to ascertain whether the proposal will infringe the aerodrome's OLS. If the proposed height of the wind turbines will penetrate the OLS and the proponent still wishes to pursue the wind farm project at the selected site, then the aerodrome operator is required to notify CASA of this proposal.

**5.4** Where the height of a proposed wind turbine or wind farm is going to be 110 m or more above the ground level, the proponent of the project is required to notify CASA. This should be done through the nearest CASA Field Office. Location and contact details of CASA district aerodrome inspectors may be found on CASA's website: <http://casa.gov.au/aerodromes/contacts.htm>.

## **6. CASA REGULATORY SERVICES FOR A WIND FARM DEVELOPMENT**

*Note: At the time of drafting this AC (November 2005), CASA is in the process of consultation with industry on a proposed schedule of charges for providing regulatory services. CASA processing of a development proposal which may become hazardous to aviation, such as a wind farm development, is included in the schedule. The actual date of implementation of the cost recovery schedule will be announced in due course.*

**6.1** On receipt of a wind turbine or wind farm development notification, CASA will assess the complexity of the development and provide the proponent with a quote for the likely fee for processing the proposal. CASA will only commence work on the assessment of the development proposal on receipt of payment of the fee.

**6.2** The fee is to cover the costs of providing regulatory services by CASA specialist staff in assessing the development proposal. CASA services include the following:

- (a) assessment of the risks that the proposed wind farm will pose to aircraft safety in general, and local aircraft activities in particular;
- (b) determination of any need to change aircraft flying operational procedures when the wind turbines are erected;
- (c) in the case of an infringement of the OLS, determination of any impact on existing runways;
- (d) determination of requirements for the provision of obstacle marking or lighting, including the assessment of the wind farm obstacle lighting plan;
- (e) contact AIP publisher to initiate changes to published procedures and charts, and the issue of NOTAMs where necessary; and
- (f) liaising with planning authorities who have responsibility for the approval of the development proposal, on air safety requirements.

**6.3** Under CASR Subpart 139.E, CASA may determine that a proposed structure will be a hazardous object because of its location, height or lack of marking or lighting. Depending on the assessment, CASA will advise the proponent whether the proposed wind farm will be determined:

- (a) as not a hazardous object to aviation, or
- (b) that with the provision of approved marking and/or lighting, it will not be a hazardous object, or
- (c) as a hazardous object, but that the risks to aircraft safety may be reduced with the provision of approved marking and/or lighting.

**6.4** If CASA makes such a determination, a notice will be directed not only to the proponent of the wind farm, but also to any authorities whose approval is required for the construction. The hazard determination is a notice to recipients that, if CASA's advice is not followed, they are responsible for creating the hazard to aircraft safety and may be liable for their actions.



## **7. MARKING OF WIND TURBINES**

**7.1** CASA considers that, by day, large wind turbines are sufficiently conspicuous due to their shape and size, provided the colour of the turbine is of a contrasting colour to the background, not to require additional markings.

**7.2** Accordingly, unless the colour of the turbine is likely to blend in with the background, the characteristic obstacle marking colours and/or patterns, detailed in MOS Part 139, are not applicable.

## **8. LIGHTING OF WIND TURBINES**

**8.1** The normal standard for obstacle lighting requires lights to be located as close as practicable to the top of the objects, and at other locations so as to indicate the general definition and extent of the objects.

**8.2** For a wind turbine, the highest point is the tip of a rotating blade, presenting a practical problem with placement of lights and meeting the standard. The highest fixed part of the turbine where lights can conveniently be located is the top of the generator housing.

**8.3** In balancing the risks and providing a practical solution, CASA has adopted a measured approach by treating the turbines differently, depending on whether they are located close to an aerodrome or some distance away from it.

## **9. LIGHTING OF WIND TURBINES IN THE VICINITY OF AN AERODROME**

**9.1** CASA strongly discourages the siting of wind turbines in the vicinity of an aerodrome, as these tall structures can pose serious hazards to aircraft conducting take-off and landing operations.

**9.2** Where a proposed wind turbine has to be located such that it will penetrate the OLS of an aerodrome, and it is determined by CASA that it will require obstacle lighting, the top lights are required to be arranged so as to mark the highest point reached by the rotating blades. The need to mark the highest point is necessary because aircraft conducting the take-off and landing phases of flight will be close to the ground and providing obstacle lights at only approximately 2/3 of the maximum height of the turbine could lead pilots into a false sense of vertical separation.

**9.3** As it is not practicable to install obstacle lights at the tip of the blades, these lights may be located on a separate supporting structure adjacent to the wind turbine, at a height that is corresponding to the highest point of the rotating blade of the turbine.

## **10. LIGHTING OF WIND TURBINES NOT IN THE VICINITY OF AN AERODROME, WITH A HEIGHT OF 110M OR MORE**

**10.1** Where a proposed wind turbine is located not in the vicinity of an aerodrome, and CASA has determined that obstacle lighting is required, the obstacle lights may be placed on top of the generator housing.

## **11. OBSTACLE LIGHTING STANDARDS FOR WIND TURBINES**

### **11.1** In the case of a single wind turbine:

- (a) two flashing red medium intensity obstacle lights should be provided;
- (b) the light fixtures should be mounted at a horizontal separation to ensure an unobstructed view of at least one of the lights by a pilot approaching from any direction;
- (c) both lights should flash simultaneously; and
- (d) the characteristics of the obstacle lights should be in accordance with MOS Part-139, Chapter 9.

*Note: Intermediate height lights, normally required for obstacles in excess of 45m height above ground level, by MOS Part 139 standards, are not required in the specific case of wind turbines.*

### **11.2** In the case of a wind farm, sufficient individual wind turbines should be lighted to indicate the extent of the group of turbines:

- (a) the interval between obstacle lighted turbines should not exceed 900 m, which is the current standard for an extensive object or a group of closely spaced objects;
- (b) in addition, the most prominent (highest for the terrain) turbine(s) should be lighted, if not included amongst the turbines lighted in accordance with (a) above; and
- (c) the lighting of individual turbines should be in accordance with 11.1 above.

*Note: Some international regulatory authorities are considering requiring that all lighting provided at a wind farm should flash simultaneously. This proposal is still to be validated and accepted. It is suggested that wind farm operators bear in mind that the simultaneous flashing of all lights at a wind farm could become accepted practice some time in the future.*

**11.3** Where obstacle lighting is to be provided, it is necessary to establish a monitoring, reporting and maintenance procedure to ensure outages are detected, reported and rectified. This would include making an arrangement for a recognised responsible person from the wind farm to notify the relevant CASA office, so that CASA can initiate NOTAM action to advise pilots of light outages.

## **12. SUBMISSION OF WIND FARM OBSTACLE LIGHTING PLAN**

**12.1** When the design of the wind farm is finalised, the developer will need to submit a wind farm lighting plan showing the obstacle lighting arrangement for the wind farm. This is to allow CASA to assess whether the lighting arrangements are in accordance with standards and whether they would provide pilots with a clear indication of location and extent of the wind turbines.

**12.2** CASA may require changes to be made or require additional lights where exceptional local conditions require these.

**12.3** The wind farm obstacle lighting plan would also be used for checking that the agreed lighting has been provided and maintained.

**12.4** This plan needs to be updated if further development of the wind farm takes place.

### **13. REPORTING OF WIND TURBINES LESS THAN 110M IN HEIGHT**

**13.1** There is no requirement for CASA to be notified if a proposed wind turbine is less than 110 m in height and does not infringe the OLS of an aerodrome. However, being tall structures, they may still need to be included in the national database of tall structures maintained by the Royal Australian Air Force. Information on reporting of tall structures may be found in AC 139-08 - Reporting of Tall Structures: <http://casa.gov.au/rules/1998casr/139/139c08.pdf>

### **14. ENVIRONMENTAL CONCERNS WITH OBSTACLE LIGHTS ON WIND TURBINES**

**14.1** There have been concerns raised that the obstacle lights may be visually unacceptable to humans. It should be noted that obstacle lighting has been in use on buildings and structures for a very long time, and been accepted in Australia and the rest of the world. It is possible that some of the visual amenity criticism of obstacle lighting on wind turbines may be an expression of concern with operation and siting of the wind turbine itself, rather than the lights. In any case, correct alignment, and if necessary, appropriate shielding of the light fittings should minimise the visual impact of the obstacle lighting on adjacent areas.

**14.2** There have also been concerns raised that standard obstacle lighting might adversely affect wildlife, including birds and bats. CASA is prepared to examine innovative options to relieve the impact on the environment, provided they can be proven to effectively satisfy the operational requirement of making the wind turbines conspicuous to pilots. In this case, the onus rests with the proponent of the wind farm to develop and support, with evidence, the effectiveness of their proposed alternative.

**14.3** Proponents of wind farms should be aware that there may be more regulatory requirements of other government departments and organisations, other than described in this AC.

### **15. VOLUNTARY PROVISION OF OBSTACLE LIGHTS**

**15.1** CASA's regulatory regime for obstacle lighting provides an appropriate level of safety for normal aircraft operations. Certain flying operations, by their functional nature, involve lower than normal flying, for example aerial agricultural spraying, aerial mustering, power line inspection, helicopter operations including search and rescue, some sports aviation and some military training. These pilots require special training, and are required to take obstacles into account when planning and conducting low flying operations. Wind farm operators should check if proposed wind turbines will be located near areas where low flying operations are likely to be conducted and, if so, consider their duty of care to such activities.

**15.2** If a wind farm operator chooses to provide obstacle lighting of his own volition, the owner should follow the standards for lighting contained in this AC. This will ensure pilots will recognise, and correctly interpret the visual warning provided, and provide low flying pilots with a last line of defence against inadvertent collision.

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