

Siting Guidelines for Wind Farms in Australia

The background of the slide is a photograph of a wind farm. Several white wind turbines are visible against a clear blue sky. The ground is dry and brown, suggesting an arid or semi-arid environment. A paved road or path leads from the foreground towards the turbines. In the distance, there is a small building and a line of trees.

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Siting Guidelines for Wind Farms in Australia

The background of the slide is a photograph of a wind farm. Several white wind turbines are visible against a clear blue sky. In the foreground, there is a dirt road that curves through a field of dry, yellowish-brown grass. To the right of the road, there is a small, dark-colored building with a gabled roof. The overall scene is a typical rural landscape in Australia.

- Determine the suitability of a site with respect to:
 - Government Planning, Policy and Procedure
 - Environmental Impact
 - Aesthetics
 - Social and Cultural Issues
 - Heritage

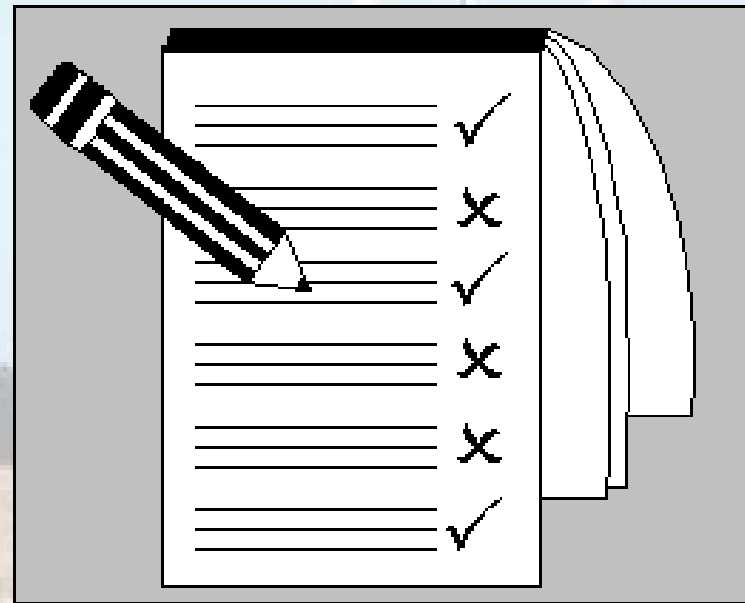
Sustainable Energy Requirements

- Brownouts expected in Australian cities in 4-years
- Clean Energy Sources
- Kyoto Climate Summit
 - Australian Federal Government 2%
 - Victorian State Government 10%



Initial Investigation

- **The initial site investigation should include:**
 - Grid Location
 - Land ownership
 - Planning Controls
 - Cultural Significance
 - Economic Impacts
 - Flora & Fauna



The need for Guidelines

- Protect and preserve culturally, environmentally and socially significant areas and wildlife.



Picture taken by Sadaka, Christopher

The need for Guidelines



- Tehachapi Pass in California USA
- Density
- Location
- Aesthetics
- Why Guidelines are required?



Public Opinion and Acceptance

- Public & Professional Opinion
 - Who, What, Where, When & Why?
- Wind Energy Organisations
 - Initiate questionnaires at Public Exhibition
 - Public Meetings
 - Information Sessions
 - School Education Programs



General Aesthetics



Blades

- Colour - off-white / grey
- Length - 35m
- Rotation - clockwise

Generator

- Colour - off-white / grey

Tower

- Colour - off-white / grey
- Height - 70m
- Base Diameter - 4 → 7m
- Top Diameter - 2m

Technical Perspective



- Technical Guidelines

- Blade Glint

- Light Reflection off turbine blades

- Shadow Flicker

- Rapid moving shadows cast from the blades

- Noise

- Noise created by operation of the Turbine

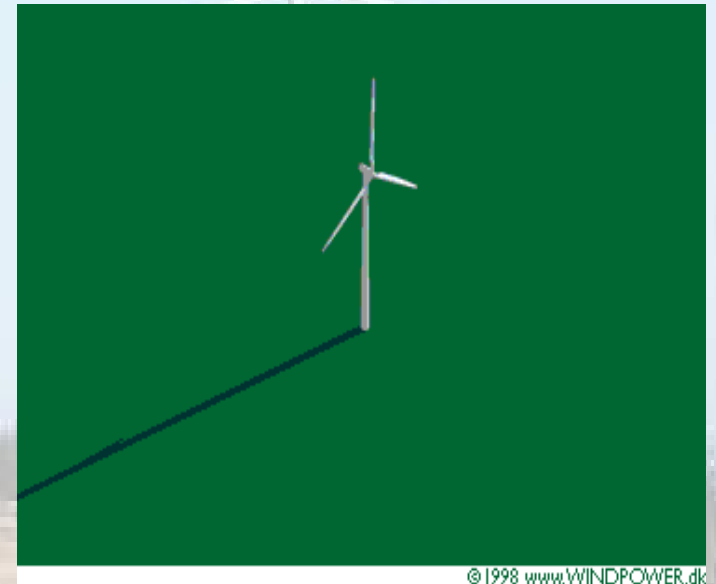
Blade Glint

- Turbines should be painted with a Non-Reflective Coatings.
- Turbines should not be erected where blade glint may have the potential to cause hazard or disruption.



Shadow Flicker

- Most shadows are cast during sunrise and sunset.
- Reported to disorientate and trigger seizures in the 2% of the European population that suffer epilepsy.
- EMD of Denmark computer model



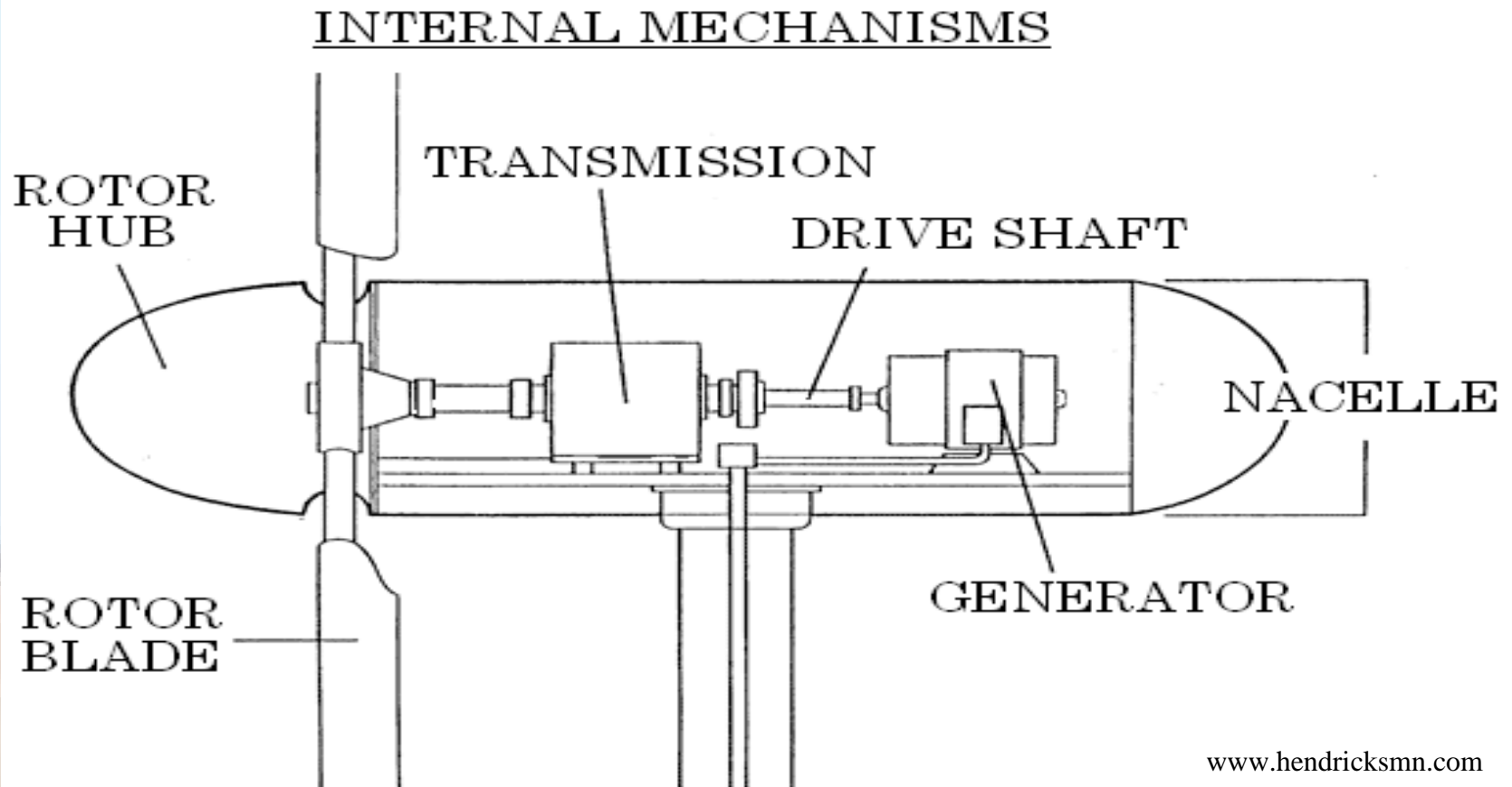
Shadow Flicker

The background of the slide is a photograph of a wind farm. Several white wind turbines are visible against a clear blue sky. In the foreground, there is a road that curves through a field of dry, brown grass. A small, dark-colored building is situated near the road on the right side.

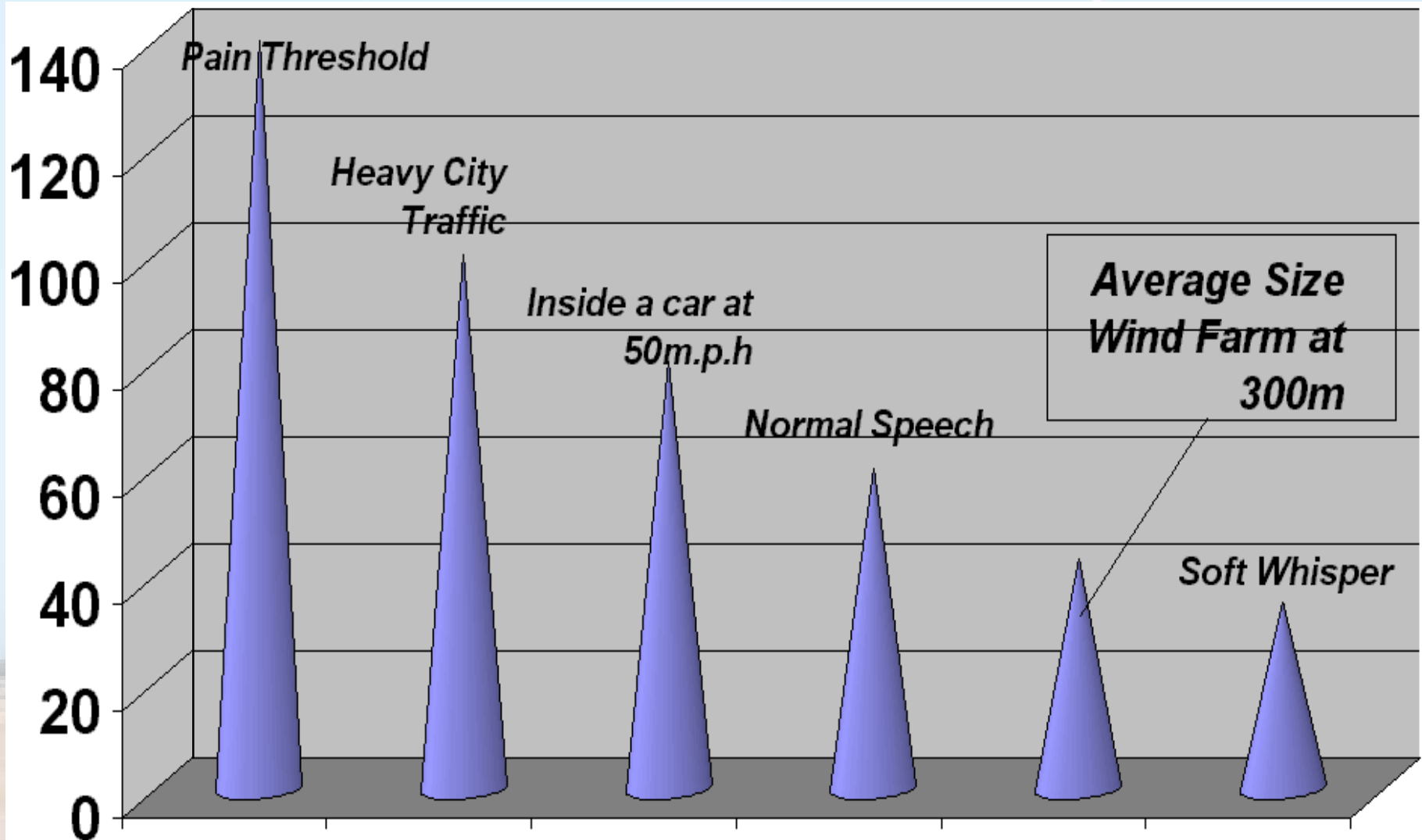
- Turbines should not be erected where:
 - They cast shadows over buildings and homes
 - Shadow flicker has the potential to cause hazard or disruption.
- The effects of shadow flicker should be minimised through use of computer modelling.

Sound and Noise

- Noise is created from the working components of a turbine



Sound Comparison (Decibels)



Noise Limits

- **40dB(A)L₉₀**
- That is for 90% of the operational time, 40dB(A) must not be exceeded.
- Measurement taken at the closest point, of the nearest residences to the wind farm.

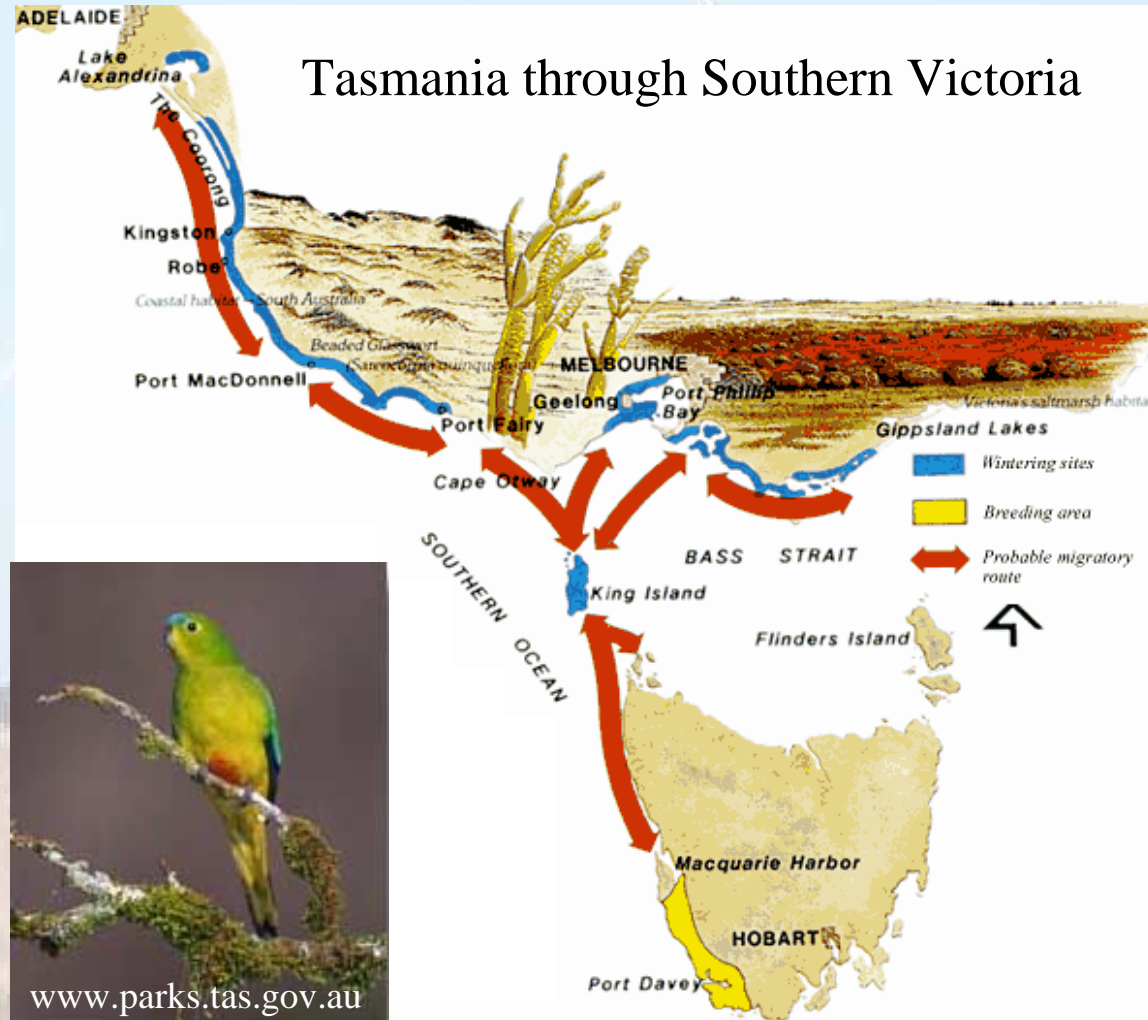
Flora & Fauna



- Principle Impacts on Flora and Fauna
 - Road Grading
 - Clearing & Grubbing
- Wind farms are generally located in wide-open planes
- Fauna is mainly effected by the labourers during installation

Birds, Bats & Migration

- Wind Farms must be sited outside migration zones.
- Orange Bellied Parrot
 - Breeds in coastal Tasmania
 - Migrates to Victoria & South Australia for the winter.



Government Policy, Legislation and Planning

Hierarchy of Importance

1. **Federal** Government Planning, Policy and Procedures.
2. Environmental Effects Statements
3. **State** Government Planning, Policy and Procedures.
4. **Local** Government Advice, Planning, Policy and Procedures.
5. State roads authority construction guidelines.



Conclusion

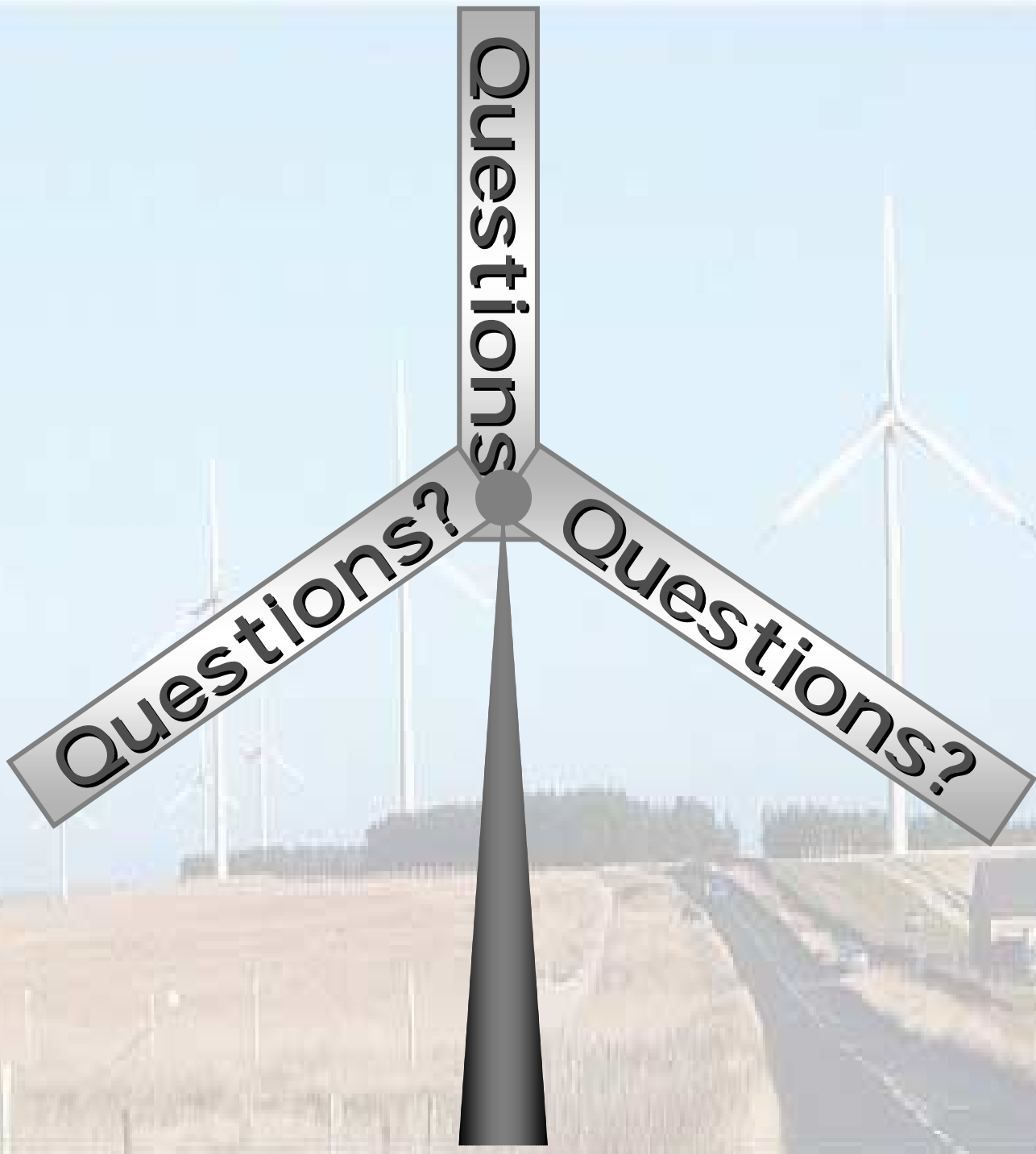
- Facilitate growth in the Australian wind energy industry.
- Achieved through public acceptance.
- Siting in an environmentally and socially acceptable manner.
- Public consultation.
- Addressing public concerns.



Conclusion



- Minimise the effects on flora and fauna
- Minimise the impact of blade glint, shadow flicker and noise.
- Site wind farms outside bird and bat migration zones.
- In accordance with Government planning policy and procedures.



Questions

Questions?

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