WOODEND INTEGRATED SUSTAINABLE ENERGY (WISE), INC. SUBMISSION TO COUNCIL ON PLANNING AMENDMENT 21.17 (Local Provision), dated 19 January 2005 and OTHER MATTERS

Introduction

This submission to the Natural Resources and Environment Committee has been prepared by Woodend Integrated Sustainable Energy (WISE), a community based association in the Macedon Ranges Shire which seeks to take responsibility for our carbon future.

WISE was incorporated in December 2007, currently has 46 members and has a goal of 500 members by mid-2008. WISE intends to be a driving force within the local community for encouraging and providing opportunities for energy conservation, renewable energy and water conservation. There are several WISE projects currently being worked on or under consideration, including:

- Brokering bulk purchase and installation of grid-interactive solar panels and small scale (domestic) wind turbines, to provide lower cost renewable energy systems for residences with suitable roof area and design and wind regimes;
- Development of small scale, community-owned wind power generation, consisting of a wind 'park' of 2 x 2 MW wind generators, similar to the Hepburn Wind project which recently received VCAT approval. Distribution of 120 copies of a "project concept" flyer for such a park resulted in 86 favourable responses from households interested in supporting such a project;
- Through the revenues derived from the wind park, development of a community trust fund, to be used for retro-fitting local residences to improve energy conservation, eg. better insulation, double glazed windows, power meters;
- Submissions for amendments to the local planning regulations, aimed at encouraging energy efficiency, renewable energy production and water capture and conservation, both on a domestic and community scale. One example of a WISE submission would argue for changes to residential planning laws to include mandatory features such as north facing roofs (to maximize solar energy production), solar hot water systems and rainwater collection tanks;
- In conjunction with other like minded community organizations, submissions to power retailers and the State Government regarding feed-in tariffs for grid interactive renewable power systems in Victoria, and to include both solar and wind-based (hybrid) systems;
- Submission to Council regarding the development of guidelines for assessing the planning issues around small (domestic) wind turbines. There are currently no such guidelines, and according to current State legislation, the final approval for wind energy systems under 100 kW lies with Council;

- Installation of a biofuels distribution station in the Macedon Ranges. The station would be located in proximity to a major motor transport user to maximize efficiency of delivery; and
- Development of community building districts (eg. libraries, shire offices, pools, etc) which offer opportunities for cross-linking renewable energy production. One example under consideration is installation of a grid interactive, combined heat and power (CHAPS) system on the north-facing, unshaded roofs of the Community Centre buildings. This would allow heated water to be supplied via pipe to the neighbouring Woodend Pool, thus extending its usability. The energy supplied to the grid would gain credits for Council.

Current Council Position

Before describing the submission in detail, it is worthwhile to revisit the Council's current position on wind farms specifically and renewable energy in general. The following is a direct excerpt from the draft wind policy, as contained in Clause 21.17 in Local Planning Policies document dated 19 January 2005.

Objectives

- *To ensure that the use of wind energy technology has a minimal effect on the surrounding environment.*
- *To locate wind farms in areas with low density settlement patterns.*

Biodiversity

- *To ensure that the effect that proposed wind farms may have on biodiversity values are fully assessed and taken into consideration in the decision making process prior to development.*
- *To take into account the effect wind farms may have on the migratory paths of avifauna.*

Landscapes and Ridgelines

- *To ensure that the unique characteristics of the Macedon Ranges Shire's environment, landscape and community are preserved when wind energy facilities are being assessed.*

Policy

It is policy that:

- *Any proposed wind farm development be assessed through the State Government's two stage EES process, with particular emphasis on landscape and biodiversity values.*
- *Community input at each stage for such a process is essential regardless of the size of the proposal.*
- *The proposal should be evaluated by an independent panel (not VCAT) involving independent specialists with expertise in each component of sustainability.*

It is policy that the responsible authority considers:

- *The findings of the EES and panel report.*
- *The landscape impact on significant landscapes*
- *The settlement pattern, and whether the site is located in an area where dwelling density is less than one dwelling per 100 Ha.*

A series of draft maps were commissioned by Council to accompany the draft wind policy and amendment, and these are attached in Attachment A of the submission. The overlays used to construct the maps included the following:

- Areas of greater than 7 metres per second (m/sec) wind speed;
- Less than 1 house per 100 hectares;
- Productive agricultural land;
- Significant landscape overlay; and
- Vegetation protection overlay.

The combined map, showing all the proposed planning restrictions, indicates the areas deemed suitable for wind energy production based on the current Council position.

WISE Position

WISE recognizes the need to evaluate wind energy projects in a detailed and sound manner, involving all stakeholders including the local community. However, we also recognize the imperative to attain carbon neutrality, part or all of which could be achieved in the MRS through exploiting the rich wind resources in a sensible and sensitive manner. It is WISE's position that local communities, if they so seek, should not be denied the opportunity to derive the environmental and economic benefits available to us from renewable energy sources, including wind.

WISE is concerned that the current draft amendment to the Planning Act regarding large scale (eg. > 10 turbines) wind farms, as it reflects the current Council's attitude, presents an unreasonable and un-necessary obstruction to smaller scale, individual and community wind power generation. We consider the process behind the selection of suitable areas for wind farms as submitted by Council to be fundamentally flawed and in need of review and expansion.

The points of specific disagreement with Clause 21.17, which form the basis for our submission, are as follows:

- The inclusion of the statement 'regardless of size' in relation to wind energy systems, and linking this to an EES process and panles of independent experts. We consider this an unreasonable and un-necessary restriction to the uptake of different, smaller-scale forms of wind energy production such as desired by individual citizens or groups of citizens who cannot afford the EES process. We consider the current VCAT process to be more than adequate, as it provides the opportunity for pros and cons of any particular dispute to be tested.

- Following on from above, the lack of distinction in the policy between large scale (eg. >10 turbines) wind farms and individual and community owned wind power;
- The inclusion of the <1 house per 100 hectare restriction and vegetation overlays. These are a blanket provisions which do not account for the specific characteristics peculiar to any site. For example, features such as tree lines and hill slopes can assist in obscuring the view of wind turbines and minimizing visual impact.
- Inclusion of the land category referred to as Productive Agricultural Operations in the elimination process. It is well recognized that rural landholders seek and receive significant financial benefits from annuities for allowing installation of turbines on their land. They are also able to continue productive agricultural operations due to the low footprint of wind turbines;
- The lack of a sound, unbiased assessment of community attitudes towards different forms of sustainable, carbon neutral projects such as a community owned or domestic wind energy.

As such, we ask that Council adopt a more far-sighted attitude towards the vexing issue of sustainability in an energy intensive world, by maximizing the use local energy resources. To this end, we believe the review of the Council's wind policy should allow for the following:

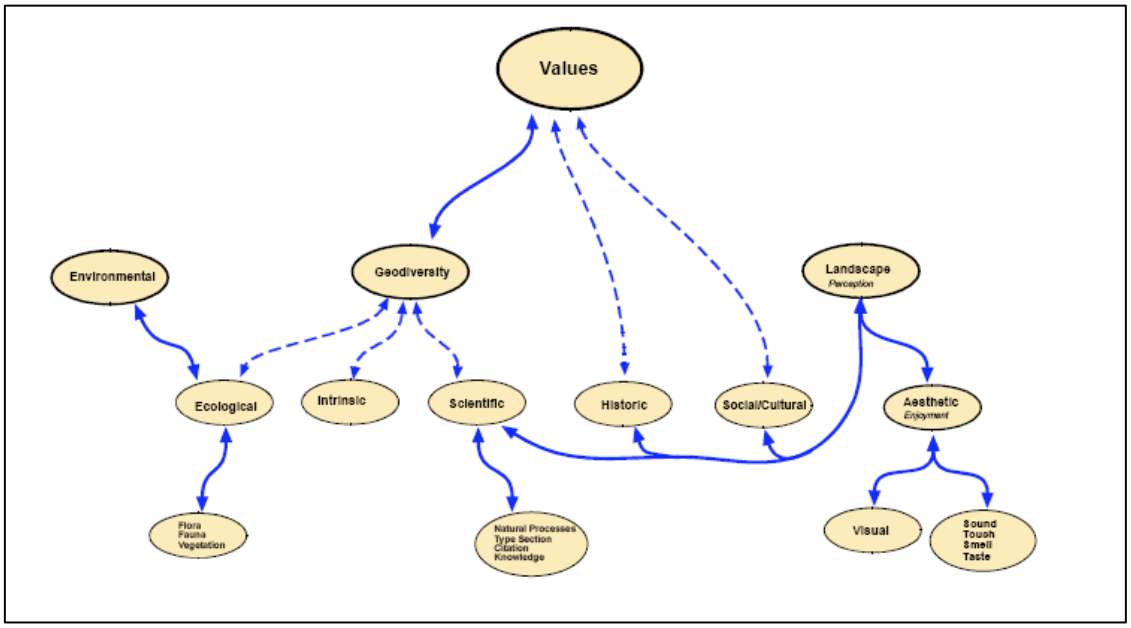
- Development of a framework for assessing smaller-scale, individual and community owned wind renewable energy systems;
- Retention of the link with the VCAT approvals process;
- Scrapping of the current set of draft maps showing areas deemed suitable for wind energy production according to Council;
- Completion of a sound, unbiased survey of the local community regarding the revised and expanded wind policy; and
- Based on this survey, drafting of new maps showing areas deemed suitable for wind energy production, including smaller scale community owned and domestic turbines.

Discussion on Landscape Impacts

The Council's position appears to be based on the belief that the sensitive issues of landscape values and biodiversity are not addressed adequately by the current planning approvals process. WISE disagrees with this position, and considers that the current VCAT process indeed addresses all of the issues raised by Council, in particular landscape values and biodiversity.

One example of a comprehensive landscape values assessment report is attached – it was developed for the community-owned Hepburn Wind project. The report details the results of detailed studies of various aspects of landscape values, as graphically summarized in the schematic below (after Cleary 2006).

Landscape Values and Their Relationship to Each Other



According to the Stage 1 report on Wind Farms and Landscape Values prepared by the Australian Council of National Trusts (2005), in conjunction with the Australia Wind Energy Association, the characteristics that contribute to potential landscape impacts (positive or otherwise) of wind energy facilities include:

- Location;
- The height of towers and turbines;
- The number of towers;
- Movement;
- Colour and materials; and
- Ancillary infrastructure.

In debates about the impact of wind farms on landscape values, there is a tendency for polarised views on the part of people with firm opinions, particularly regarding visual impacts. Indeed, many of the effects just discussed can be construed either positively or

negatively, depending on the viewer's perspective. But this polarisation is not always an accurate reflection of the views of the community in general. A large majority of people might not have very strong views either way.

In British studies of residents living close to (up to 20 kilometres) a wind farm a large majority (74 per cent) thought the wind farm was either neutral in its impacts on the landscape (51 per cent) or had no opinion either way (23 per cent) (Braunholtz 2003), although the closer they lived to a wind farm the more likely they were to have strong opinions (ie not in my backyard).

In the case of Hepburn Wind, there were around 430 signed up supporters of the project, in comparison with 18 objectors. Some of these objectors lived over 10 km from the proposed site, were members of the Landscape Guardians and clearly had no personal issues but rather a larger political agenda.

What Positive Impacts Can Wind Farms Have on a Landscape?

Although wind energy facilities have substantial—and to a large extent unavoidable—impacts on the landscape, elements of the design, scale and function of the facilities do contribute some perceived landscape benefits.

Aesthetics

To many people, the form, line and colour of wind turbines are aesthetically pleasing. The clean lines of the turbines, their contrast with the landscape and the uniformity of their appearance are cited as benefits, which in some cases can even improve the appearance of a landscape (Smith 2003). Among other things, the aesthetic landscape values of wind farms are recognised as stemming from the following:

- Sleek aerodynamic and sculptural forms;
- Modernity of design;
- Consistency and repetition of features;
- A sense of order; and
- A strong presence.

Symbolic Value

Wind turbines, whether large or small, are strong, recognisable symbols of new technologies and sustainable electricity production. Some people welcome the 'machine element' of a wind farm in the landscape and see it as an example of humans working in harmony with nature.

Function

Many respondents to the stakeholder survey saw a positive value of wind energy developments as deriving from their ability to provide a public good (electricity) using sustainable, renewable means, as opposed to coal-fired power station.

Substitution

Another perceived benefit of wind farms concerns the trade-off with alternative developments that produce the same product by different means and often in different

locations. The starkest example of this is a coal-fired power station, although many hundreds of turbines are required to replace the power output of one such facility.

It should be noted that, although wind farms often feature prominently in the landscape, the greenhouse gas emissions they help to reduce are not immediately evident. The landscape impacts of large-scale coal-fired power stations—which currently produce about 84 per cent of Australia's electricity—are, however, also largely 'out of sight and out of mind' for the community.

What Negative Impacts Can Wind Farms Have on a Landscape?

Impacts on Landscape Character and Scenery

Both the wind turbines themselves and their ancillary infrastructure (electricity transmission lines, substations, access roads, and so on) can affect the character of a landscape. Given the scale and size of wind turbines and typical wind farms, and their contrast with the landscapes in which they are placed, it is not surprising that their effects on scenery and landscape character are perhaps the most contested of all values.

The physical presence of wind farm turbines is not disputed. To some, the visual dominance is desired or accepted, but to others it unacceptably changes the character of a place. Several survey respondents claimed wind farms contribute to an 'industrialisation' of rural landscapes. A less visceral viewpoint was expressed by an expert in visual management who responded as follows: *For this individual, the towers were 'tall, graceful, elegantly designed' but at 'very large scale… intrusive on the landscape'.*

Individually, wind turbines exceed 'human scale' and can be an overpowering and unacceptable presence to the viewer. Survey respondents said wind turbines (either individually or collectively) have a heightened impact on the character and scenic values of the landscape and on features of high scenic or aesthetic value to communities. It is as collections of turbines that wind energy facilities can have the greatest impact on character and scenery. Although this was not quantitatively measured in this survey, greater numbers of turbines covering a larger land area or occurring in important view fields appear more likely to be regarded as unacceptably detracting from landscape character or scenic values.

Overseas studies (based on the now superseded technology that required large clusters of smaller turbines) have found that the number of turbines has a greater effect on landscape quality than the size of turbines (van de Wardt & Staats 1988). Studies by Lothian in South Australia suggest, however, that this is context specific; that is, a greater number of turbines in coastal landscapes may be more negative, while in inland locations this may not be the case.

The concept of smaller-scale community-owned and domestic wind energy systems provides an opportunity to reduce these effects, while at the same time allowing the local community to derive environmental and economic benefits - WISE.

The scale of wind turbines and their contrast with landscapes mean that impacts on scenic and character values extend well beyond the wind farm site. Although the threshold distance for visual intrusion is debated, the potential scenic and character

impacts of wind farms extend to far greater distances than those of most other types of development in a landscape (Schwann 2002). There is, therefore, concern about visual intrusion on areas. Some of the impacts on values described as 'character' might reflect some of the more intangible values identified for landscapes, among them sense of place, personal association and contemporary indigenous values.

The Portland Wind Energy Project Panel report (Smith 2003) cites Parks Victoria claiming that wind generators are 'easily seen in clear weather' up to 20 kilometres away and landscape professional Alan Wyatt suggesting that beyond 5 kilometres the 'visual impact reduces to imperceptible'.

Impacts on Indigenous Cultural Values

A proposed wind farm site might be of cultural significance to Indigenous Australians because of its association with tradition or with the current practices of local Indigenous people or the traditional owners or custodians of that site. The presence of particular animal or plant species, for example, might have spiritual significance. Alternatively, a place might be of significance because it was the site of a historical event such as a massacre or corroboree ground.

A traditional owner who participated in the survey said that, in her experience, Aboriginal people's main concerns about wind farms in coastal areas were that the wind farms block sacred coastal views, cause disruption to coastal fauna (in particular, migratory birds) and result in damage to sites with other Indigenous heritage values. Nonetheless, the presence of Indigenous values at a site will not necessarily preclude development of that site for a wind farm, as evidenced by the partnership between Framlingham Aboriginal Trust and Pacific Hydro to develop a wind farm on Aboriginal-owned land (Deen Marr) at Yambuk in Victoria.

Impacts on Amenity

Amenity here is separated from scenic and character impacts, although both are related. Amenity refers to the continuing enjoyment of places—residences, recreational areas, travel routes, and so on. Apart from wind turbines being dominant visual elements, their movement can produce other visual phenomena that might adversely affect amenity, among them sun glint and strobing effects caused by reflection from the blades, overshadowing and shadow flicker. These effects tend to be experienced by people close to a wind farm, although sun glint can be visible for several kilometres. It must be noted, though, that these effects are assessed during the development planning process, and if it is found that there is a potential effect, it can be designed out by use of, for example, non-reflective paints.

Impacts on Cultural Heritage

Adverse impacts on built heritage items are generally a non issue as built heritage items are reasonably well documented and protected in Australia, and as a consequence wind farms have been sited away from them. There is, however, an emerging recognition in the heritage profession that the geographical and landscape contexts of sites are also worthy of protection. The Burra Charter refers to the need to protect the 'fabric and setting' of heritage places.

Through their visual and landscape effects, and their potential dominance, wind farms can greatly change the setting of heritage features and thus affect the protection of their values. In one landscape assessment study in Tasmania, for example, it was

recommended that a wind farm be sited away from the sight line of a historic coastal settlement. Furthermore, landscapes themselves can be identified as important heritage items by virtue of their association with the history or development of people and cultures—a value that is increasingly recognised through formal documentation such as the National Trust registers of significant landscapes. These landscapes can also be affected by inappropriate design or siting of wind energy facilities.

Impacts on Contemporary Cultural Values and Sense of Place

Surveys indicate that some people feel an emotional, and sometimes spiritual, connection with places where wind farms have been developed. Sometimes these connections appear to be shared, by the community generally or by particular groups. In Australia, the coast is one such place, as attested to by references to the coast in our literature, art, theatre, music and television productions.

Respondents described how in some circumstances it seemed to them those connections had been adversely affected by the introduction of wind farms. One respondent noted, for example, that the introduction of the wind farm, or 'machine element', to a place she valued had changed her feelings about that place as a site of reflection and contemplation. It is difficult to gain an accurate understanding of the extent of these effects, but a sense of loss nevertheless pervaded a number of responses from respondents with a mainly negative attitude to wind farms.

Are There Ways of Siting and Designing Wind Farms that Might Reduce the Negative Impacts?

For some values—for example, a location of high biological significance—avoidance might be the only way of protecting a value. For other values, impacts are more difficult to avoid. For example, from the perspective of scenery and character, it is virtually impossible to hide or screen a large scale wind farm (Birke-Neilsen 1996).

Given the height of the development, vegetative screening is of use only when located to screen views *from* a viewpoint, rather than *to* a tower (Smith 2003). In a highly vegetated area such as the MRS, vegetative screening may in fact be useful in reducing visual impacts.

Typical treatments for minimising the visibility of developments in the landscape—such as integrating the development with topography or borrowing line, form, colour and texture from the surrounding landscape— may be difficult to achieve in the case of large scale wind farms and, indeed, might be undesirable (Stanton 1996). This would perhaps be less difficult for a small number of turbines.

Instead, careful layout that avoids particularly sensitive features and focuses on optimising a wind farm's positive attributes is more effective. Wulff (2002) notes that, of the three potential siting options for wind turbines—to disguise or hide; to merge or integrate; or to highlight— 'highlighting of towers is intrinsically the easiest visual result to achieve'. With this in mind, there are a range of design, siting and management options for reducing the intrusive impacts of wind farms and improving their appearance, thus making them more acceptable.

Siting and Layout

A number of layout regimes have the potential to reduce landscape impacts. For example, survey respondents suggested that *clustering* turbines to avoid significant view

lines or landscape features would reduce their visual and landscape impacts. But such clustering might also reduce the generating efficiency of typical wind farms and present challenges for the management of other potential impacts. **This would not be the case for a smaller scale community owned project such as that proposed by WISE, consisting of only two to three turbines**.

Height
People involved in surveys have referred to the overpowering presence of wind turbines: this is generally a reaction to the height of the towers. Many people felt that making the towers shorter would reduce their negative impact. One landscape impact assessment recommended that the towers not exceed the relative visual height of landscape features in the region; that is, from key viewing locations the tops of the turbines should be visually equivalent to the apparent height of distant hills or landscape features, where these occur.

Such judgments are, however, likely to be specific to the particular landscape context, and no Australian studies of the relative visual intrusion of different turbine heights in different viewing situations are known. The height of wind turbines is a design constraint: the higher the rotor and the longer the rotor blade, the greater the amount of electricity produced. As a result, a reduction in rotor height or blade length can require an increase in the number of turbines proposed, which in turn might generate other unwanted effects, such as visual clutter and an increase in the amount of land required for the development.

Spacing and Density
Locating numerous turbines in an open landscape can result in negative impacts for some viewers. Indeed, the number of turbines in an array can be more detrimental than the height of the turbines themselves (van de Wardt & Staats 1998). A study in the United States found that people are more likely to prefer fewer larger turbines than more smaller ones (Thayer & Freedman 1987). This again is line with the proposed WISE mini-farm.

In addition, the effects of groups of turbines can be reduced by avoiding overly dense spacing (which creates visual clutter) by clustering turbines in ‘functional units’, with substantial open space between them (Gipe 2002). This can also be a useful technique for limiting impacts on particular views or features.

Focusing on the Positive Attributes
The relative acceptability of wind farms has been found to be a consequence of how ‘well presented’ they appear to viewers (Gipe 2002). Focusing on the positive attributes—including the turbines’ aesthetic form (using clean lines and modern materials), consistency of design (turbines of the same colour, design and height) and function (all turbines moving, thus appearing to be functional)—has been cited as important for ensuring that wind farms are accepted more readily (Gipe 2002).

Hiding or Managing Negative Attributes
Despite the difficultly of screening turbines, it is possible to hide or limit the potentially negative attributes of a wind energy facility; for example, putting intra-farm power lines

underground to avoid visual conflict with the turbines, siting roads in such a way as to avoid sensitive areas and the potential for unsightly erosion, and cleaning up the site and removing waste (Gipe 2002; Stanton 1996).

Colour and Materials
Careful selection of colour and materials can reduce contrast and the visual impact of wind turbines on the landscape. Muted colours (soft grey, tan and cream, for example) and materials that have a matte finish can reduce distant visibility, contrast and sun glitter. Because of the scale of wind turbines, most views of the tops of the turbines and the rotors are against the backdrop of the sky, so lighter colours are often recommended.

The following is a proposed approach for assessing community attitudes to different forms of wind energy production, to fill the gap as currently based on typical large scale wind energy systems.

Proposed Approach to Assessment of Community Attitudes to Local, Small and Large Scale Wind Power Generation

There are three stages to the Approach:

- The aim of Stage One is to identify, analyse and develop priorities for key issues and then develop a Business Plan to guide the Stage Two phase of the Project.

- Stage Two will involve developing an agreed methodology for assessing the landscape values of small and large scale wind power generation proposals in the Macedon Ranges Shire.

- Stage Three will involve road-testing the methodology.

Stage One Process
Stage One of the Project would involve the following six steps:

- Step 1—preliminary scoping using desk-based research and literature reviews
- Step 2—a survey of stakeholders' views
- Step 3—preparation of the draft issues paper and consideration of stakeholders'
- responses
- Step 4—stakeholder workshops in local community centres (eg. Woodend, Gisborne, Kyneton)
- Step 5—preparation of the final report
- Step 6—development of the Stage Two Business Plan.

Consultation
Stage One entailed three phases of stakeholder consultation:

- Circulation of a stakeholder survey instrument, analysis of the survey responses, and
- targeted follow-up phone interviews;
- Release of the draft issues paper, which was based on the survey results and the

- consultants' research, for public comment;
- Stakeholder workshops.

The Draft Issues Paper
The draft issues paper would then deal with a range of matters, including:

- The characteristics of wind farms
- Potential positive and negative impacts of wind farms on landscapes
- Existing landscape assessment approaches and questions about their application
- Directions for applying this Project.

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