

‘Green’ is good, but is more ‘green’ always better? NZ wind farming experience

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Paper presented to the International Association for Impact Assessment Annual Conference, Geneva, 8-11 April 2010

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Current challenges and impacts:

The pressure for more green projects

There are many reasons to promote increased development of renewable electricity sources: reducing carbon emissions, diversifying electricity sources, distributing electricity sources geographically around the country closer to demand and building the resource base for green business.

Rarely does a week pass without some media mention of climate change, its possible consequences and its links to human activities. The Kyoto Protocol and the Copenhagen meeting in December 2009 highlighted the need for all nations to consider reducing the rate at which their economies generate greenhouse gases. These imperatives, at least in part, explain the drive to give greater priority to renewable energy sources, often referred to as 'green' energy sources. In this context, 'green' is deemed to be good. Indeed, national public opinion surveys in New Zealand (EECA, various dates) since 1990 have consistently demonstrated large majorities in favour of generating electricity from renewable energy sources such as hydro-electricity, wind and geothermal resources. In response, the government has established a national target for the percentage of its electricity which should be generated from renewable sources - 90% by the year 2025 (Ministry for the Environment, 2009, p.22).

But maximising renewable electricity generation in the national interest does not mean that local interests in sustainable development should be over-ruled. Just because a renewable energy source exists does not imply that it should be 'developed' in an economic sense. Neither does setting a national target imply that every river should be dammed, just because it can be, or every wind-swept ridge should be covered in wind turbines. Electricity generation is only one of the rival uses for natural resources.

Furthermore, within the renewable electricity sector in New Zealand there are both potential synergies and current conflicts. From a resource efficiency perspective, the combination of hydro and wind developments provides both instantaneous power capacity and complementary energy storage capacity. However, from a resource competition perspective, public resistance (local and national) to further hydro development creates added pressure for more wind-farm developments in preference to more hydro-electric developments.

Such circumstances can create strong tensions between national and local interests; and tensions between the environmental, social and economic dimensions of sustainable development. This debate focuses on equity issues: who do the rivers and ridges belong to? Who benefits from their development and how are these benefits shared around?

Current deficiencies in policy making, planning and standards

Resolving these tensions is hampered by deficiencies in regional policy making, business project planning and national standards - particularly in respect of wind-farm developments, which is the focus of this case study.

In respect of regional policy making, no regional councils have addressed wind resource development potential at the regional level. There is no socially-informed policy debate about the desirability, preferred locations or potential extent of wind farm development in any of the regions. In the absence of a regional plan statement about wind resource development, policy makers tend to designate wind farms as ‘non-complying’ activities rather than ‘permitted activities’ in some locations and ‘prohibited activities’ in other locations, leaving the way open for applications almost anywhere. In short, the regional policy makers generally have failed to show any leadership over the critical questions of how much wind farming the regional community wishes to encourage, and community preferences for the future potential location of wind farms. This situation leaves the planning of wind farm developments largely in the hands of industry interests and project planners. Strategic environmental and social assessment are largely absent.

The typical approach to wind farm project planning uses technical, wind resource and financial criteria as the first filters in defining the opportunity set, and often these are the only filters applied prior to identifying a preferred site. Social considerations are generally not influential in selection decisions for preferred sites; rather they are brought more commonly into consideration in the context of site-specific mitigation planning. Furthermore, project planners, seeking to maximise future electricity generating potentials, typically aim for the largest footprint, as determined by the same narrow set of criteria. Compounding this problem of social myopia in New Zealand, wind farm developers generate social divisions by adopting a ‘development model’ which creates winners and losers amongst neighbouring land owners. Landowners with turbines on their land receive substantial annual rental payments; immediate neighbours who may experience unwanted adverse effects receive no financial compensation.

There is a general reluctance amongst both established wind farm operators and regional councils to assess actual community experience of wind farms. This leaves noise standards for wind farms to be determined in terms of arbitrary noise exposure (dBA) levels, rather than incorporating any social experience of exposure to wind turbine noise. Until 2009, there were no cases in New Zealand where noise exposure monitoring was complemented by human observation and diary keeping. Similarly, for the purposes of land-use planning, the visual effects of wind farms are subject predominantly to expert judgement rather than expressed community experience.

A New Zealand case study

The case of the Turitea wind farm proposal in New Zealand exemplifies these tensions. The lessons expressed in this paper are drawn from the SIA experience associated with the Turitea application. However, because the wind farm application is still subject to a judicial decision¹, details from the surveys carried out as part of the SIA cannot be reported, although the tenor of the SIA findings can be discussed qualitatively.

There are few if any other locations in the world, let alone in New Zealand, where a series of wind farms is situated between 8 km and 16 km from a city of 75,000 inhabitants (see Figure 1). The Tararua Ranges form a backdrop to the City on its eastern side, but the City does not turn

¹ This particular application was subject to a procedure known in New Zealand as a national "call in". This means that instead of having the application heard by the local council, it has been heard by a judicial Board of Enquiry. This is (at least partly) because the Minister for the Environment was advised that this proposal for a large wind farm is in the national interest.

its back on these ranges. At the time the Turitea wind farm proposal entered the statutory planning process early in 2009 there were already in existence three operating wind farms, with a fourth which had been granted its planning approvals but had yet to be constructed. Table 1 summarises some relevant parameters of these existing, approved and proposed wind farms.

Figure 1 Locations of wind farm sites and distances from City centre

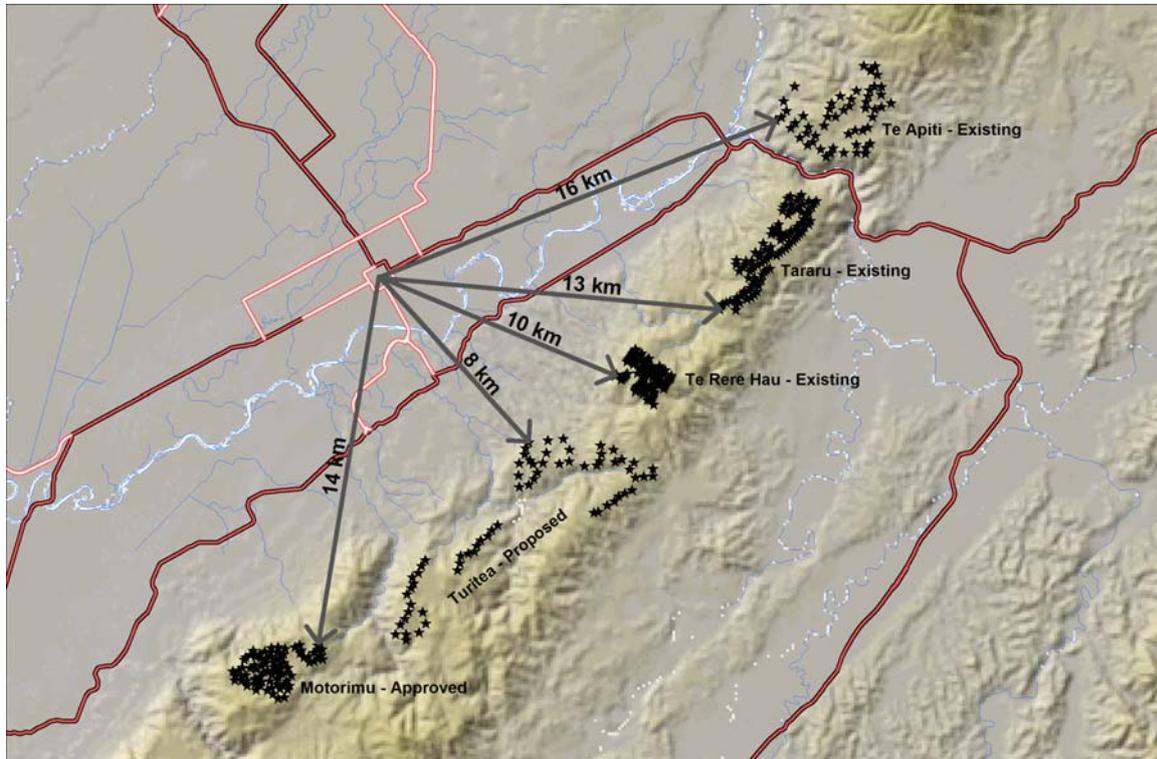


Table 1: Existing, approved and proposed wind farms near Palmerston North

<i>Wind farm name</i>	<i>Status</i>	<i>Date commissioned</i>	<i>No. of turbines</i>	<i>Distance to City centre</i>
Te Apiti	existing	2004	55	16 km
Tararua	existing	(I)1999, (II)2004, (III)2007	143 (I)48, (II)55, (III)31	13 km
Te Rere Hau	existing	2006	33 existing (97 approved)	10 km
Motorimu	approved	Not yet built	80	14 km
Turitea	proposed		122	8 km

The first wind farm near Palmerston North was constructed by the local power lines company and fed electricity directly into the City for local consumption. Subsequent national legislation required the lines company to sell its wind farm. As a result, all the existing wind farms are now connected to the national grid and feed electricity to consumers in all parts of the country. Consumption of electricity by the City of Palmerston North and its rural hinterland is therefore already more than adequately provided for by the installed capacity of the existing wind farms. Any additional capacity feeds consumers elsewhere in the country.

It is no surprise that the extent and nature of cumulative effects is a central issue for the Turitea proposal. Evidence for the rising level of concern about cumulative effects is found in the number of public submissions to each successive wind farm application (24 for the first; 655 for the fifth), the balance in these submissions between support and opposition (numbers in support outweighed those in opposition for the first two applications; for the fourth and fifth opposition outweighed support by 3:1 and 4:1 respectively), and the fact that since the third application the issue of cumulative effects has been the subject of specific attention. As at 2009 however, actual reported experience of the three local wind farms was largely positive. They were seen to have brought local revenue, local employment and tourist interest, resulting in predominantly positive associations for City residents and ratepayers (Baines, 2009). An ex-post, rapid appraisal survey of neighbours' experience of visual and noise effects from the Te Apiti wind farm reported low levels of adverse visual effects (15%) and low levels of adverse noise effects (9%) experienced (Baines, 2005). This was the first time in New Zealand that ex-post empirical social data on wind farm experience was available to resource management decision makers.

Important social effects relating to the Turitea proposal include the distribution of financial returns (electricity company, 18 private landowners, city ratepayers), employment in wind farm operations and maintenance (17 full-time jobs), cumulative visual and landscape effects (visual saturation of the ranges east of the City), cumulative recreational effects (further displacement of recreational activities from the ranges including a major designated outdoor recreational area, and noise effects (risk of intrusive noise for between 20 and 25 neighbouring residents). Construction employment effects are not dependent on immediate proximity to the City since several Palmerston North companies have established themselves as preferred contractors for wind farms in other parts of the country. The local tourism advantages of early wind farm developments are unlikely to be amplified by another wind farm in a physically less accessible location.

Results from two surveys carried out specifically in relation to the Turitea proposal - one survey of 220 residents drawn from across the entire City² and another survey of 212 residents living within 5 km of existing wind farms³ - both indicate that while support for the existing wind farm operations remains strong and experience of these existing wind farms remains predominantly favourable, public sentiment is beginning to turn against further wind farm development on the ranges. Furthermore, the cumulative adverse social effects would likely impact on many more residents of the City and its rural hinterland (Baines, 2009).

² This randomly-sampled survey enquired into City residents' landscape values, attitudes towards renewable electricity generation and contributing to national energy supply, attitudes towards and experience of existing wind farms near the City, and preferences for further wind farm development near the City.

³ This purposively-sampled survey enquired into residents experience of existing wind turbines, particularly their experience of visual and noise effects, and related responses to separation distances from the nearest turbine.

What needs to be done?

Social Impact Assessment can contribute to resolving these national-local tensions by helping to address all three deficiencies described above - deficiencies in regional policy making, business project planning and national standards.

Strategic SIA in regional policy making

There are few instances in New Zealand where strategic SIA is applied to regional policy development, although this application is increasing gradually in a range of planning contexts. In the absence of policy-level SIA for wind farms, there is little scope for community values and preferences, at various levels of community, to be considered and balanced with other factors when mandating regional policies and resource management plans for wind farms. Community preferences for encouraging or prohibiting wind farms in various locations around a region are rarely if ever canvassed. Consequently, each new wind farm proposal becomes the focus of increasingly polarised argument by rival interests because the policy vacuum leaves so much uncertainty about future potential and cumulative effects.

Strategic SIA would contribute to the properly informed policy debate necessary to defuse the policy-level tension. Consensus building activities in support of region-wide resource management plans would give greater certainty to wind farm developers and local communities alike. Strategic SIA would also have the effect of mandating consideration of social and community factors in the options stage of project planning.

Project-level SIA in business project planning

In New Zealand, social considerations tend to be incorporated towards the end of the project planning process in the context of minimising any concessions required in order to gain planning approvals.

Project-level SIA, initiated as part of scoping the project options, can be used to promote consensus on what might be a preferred wind farm location, taking into account local and national interests as well technical, resource and financial criteria.

Project-level SIA also needs to adopt a framework capable of assessing cumulative social effects in a meaningful way. The SIA for the Turitea wind farm application employed a framework based on methodology drawn from cumulative visual effects assessments - simultaneously, successively and sequentially cumulative - and applied to the other social effects identified and quantified.

Ex-post SIA to assist in developing national standards

For many years, questions have been raised about the validity of technical noise standards as appropriate means for determining appropriate separation distances between turbines and occupied residential dwellings. Enquiries to national and international noise consultants by the authors have revealed few if any attempts to correlate technical noise monitoring data with records of people's observations and experience of living in relatively close proximity to a wind farm.

Ex-post SIA carried out around existing wind farms offer a quantified basis for establishing adequate separation distances between turbines and neighbouring dwellings. This is particularly relevant when separation distances can be accurately measured, and when the sample size of respondent households increases to several hundred, as was the case with the ex-post assessments carried out for the Turitea hearing.

Potential benefits

Wind farm developments, guided by appropriate applications of SIA, as described above, can ensure that resource developments are both environmentally sustainable and socially responsible.

If 'green' is a synonym for 'sustainable', then 'green' development needs to address social, economic and environmental objectives simultaneously. The winners and losers should be identified clearly, since a blanket assumption that green is good should not be acceptable to impact assessment practitioners.

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