BEFORE THE COMMISSIONER ON BEHALF OF THE DUNEDIN CITY COUNCIL

UNDER	the Resource Management Act 1991
IN THE MATTER	an application for resource consent of LUC-2015-469
BY	Blueskin Energy Limited
	Applicant

BRIEF OF EVIDENCE OF BEN FARRELL

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EXECUTIVE SUMMARY

1. My name is Ben Farrell. I am an independent planning consultant based in Queenstown. I am reasonably experienced with the consenting and development of wind farms in New Zealand and am familiar with the site and the relevant consent documentation.

2. I have been asked by the applicant to prepare planning evidence in support of its application for small and community scale wind farm in Blueskin Bay.

3. The application is a non-complying activity under the ODP and would be a discretionary activity under the PDP if the rules under the PDP were to apply.

4. Upon consideration of the effects of the proposal, having reviewed the s.42A Report, summary of submissions, and evidence prepared by various experts on behalf of the applicant, I consider the adverse effects of the proposal will generally be no more than minor. The wind farm will result in a change to local landscape and amenity characteristics (primarily visual and noise) and this change is considered by some individual residents to be significant and adverse.

5. I have assessed the proposal against the relevant objectives and policies of the NPSREG, RPS, PRPS, ODP, and the PDP. I have also considered the objectives and policies of the NZCPS. In my opinion approving the resource consent subject to conditions accords with these policy documents.

6. As a non-complying activity consent can be granted if the application has no more than minor adverse effects on the environment or is not contrary to the objectives and policies of the ODP and PDP. In this case the proposal is not contrary to the objective and policies of the ODP and PDP and irrespective of any environmental effects of the proposal on the environment the application can be granted.

7. In my opinion the proposed wind farm represents sustainable management of natural and physical resources and I consider the application should be granted subject to conditions.

INTRODUCTION

Experience & Qualifications

8. My full name is Ben Farrell. I am an Independent Planning Consultant employed by John Edmonds & Associates Limited, a firm of independent planners and project managers based in Queenstown.

9. Over the last 17 years I have been heavily involved in New Zealand's environmental and resource management sector. In 1999 I began my tertiary education at Lincoln University studying Parks, Recreation & Tourism Management. I went onto graduate with a Bachelor of Resource Studies – Environmental Policy & Planning (2002) and a Masters of Environmental Policy (2004). During my studies I was employed by Auckland Regional Council as a Park Ranger, Greater Wellington Regional Council as Parks Planner, and Connell Wagner Limited in Christchurch as a Planner. Since graduating, I have been employed as a planner by Upper Hutt City Council (2004), Boffa Miskell Limited (in Wellington 2005-2010), Andrew Stewart Limited (in Wellington and Invercargill 2013-2015), and the Southland Regional Council (2014-2015). During 2010-2013 I was a self-employed planning consultant primarily working for Ryman Healthcare Limited and the New Zealand Wind Energy Association (NZWEA).

10. At NZWEA I provided independent planning and policy advice to the New Zealand and Australia renewable energy industry and local and central government, including the Dunedin City Council in its preparation of the PDP. I was also responsible for the preparation of industry best practice development guidelines for consenting renewable infrastructure under the RMA[1]. I was also heavily involved in the preparation of the National Policy Statement for Renewable Electricity Generation 2011 and supporting implementation guideline documents prepared by MfE and EECA. While at NZWEA I reviewed numerous national and international literature relating to the development of wind farms, including all RMA decisions that existed prior to 2013. To the best of my knowledge this includes all wind farms consented in New Zealand to date.

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[1] I lead the development of a series of industry guidelines (available only to NZWEA members) relating to Health and safety; Social impact; Landscape and natural character; Ecology; Historic heritage values (including archaeology); Māori relationship with the environment; Visual amenity values; Noise; Transportation; Recreation and tourism; Communication networks; and Aviation. These guidelines culminated in the publicly available document "Wind farm development in New Zealand: A Framework for best practice, 2013", which I was the primary author of.

11. Over the last 13 years practicing as a planner I have provided strategic and statutory planning advice on a wide variety of resource management projects for a wide variety of clients or government employers. By way of example I have been involved in the following to varying degrees:

    a. The preparation and assessment of numerous resource consent applications, notices of requirements, and Assessments of Effects on the Environment reports for a range of projects and applicants, including local and national infrastructure projects for private and public entities;

    b. Strategic planning advice to councils, central government departments, public companies, and private interests;

    c. The preparation and implementation of National Policy Statements, seven regional policy statements, two unitary plans, and 19 district/regional plans;

    d. The preparation of various RMA development and policy guideline documents including: NPS freshwater management implementation guide (for MfE), Review and update of various Quality Planning Guidance Notes (for MfE), Wind farm development in New Zealand a framework for best practice (for NZWEA); Good Management Practice Notes for NZWEA in relation to landscape, noise, Monitoring and Evaluation Plan for the NPS Renewable Electricity Generation (for MfE); NPS Electricity Generation Implementation Guide (for MfE); NPS Renewable Electricity Generation Technical Guide (EECA); NZ Coastal Policy Statement non-statutory guidance (for DOC); Best Practice Guidelines for Biodiversity Offsetting (for DOC).

12. In addition to my qualifications and experiences as a planner I am a full member of the New Zealand Planning Institute. I was on the Institute's Wellington regional branch committee from 2004-2013 and I was chairman of that branch in 2010 and 2011. I currently sit on the local Central Otago NZPI branch committee.

13. In this particular matter I have been engaged by Blueskin Energy Limited to prepare expert planning evidence in relation to its resource consent application.

14. Since 2010, I have provided Mr Scott Willis with ongoing strategic planning advice and in 2015 I reviewed a draft AEE.

15. In preparing this evidence I have reviewed the following documents, reports and statements of evidence of other experts giving evidence are relevant to my area of expertise:

- Resource Consent Application documentation[2];
- S.42A Report and supporting technical reports[3] and summary of submissions;
- Evidence on behalf the applicant dated 3 May prepared by S, Willis, J Stephenson, D Lucas, M Moore, S Chiles, V Toy and J Craig;
- Resource Management Act ('Act')
- New Zealand Coastal Policy Statement ('NZCPS')
- National Policy Statement for Renewable Electricity Generation ('NPSREG')
- Regional Policy Statement ('RPS')
- Proposed Regional Policy Statement 2015 ('PRPS')
- Operative Dunedin City District Plan ('ODP')
- Proposed District Plan ('PDP')

16. While this matter is not before the Environment Court, I confirm I have read and agree to comply with Code of Conduct for Expert Witnesses (Environment Court Practice Note 2014) as if this matter was before the Court. I confirm this evidence is within my area of expertise except where I state that I am relying on facts or information provided by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

17. Unless otherwise specified, all statements in this evidence are my opinion (all sentences and paragraphs should be read on this basis of understanding).

18. I have prepared my evidence based on my:

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[2] Inclusive of: Community Consultation Documents, Landscape Assessment, Acoustic Assessment, Ecological Assessment, Transportation Report

[3] Inclusive of memorandums from: landscape architect (Barry Knox); environmental health officer (John Sule); transportation planner/engineer (Grant Fisher); Geotech engineer (MWH); and acoustic consultant Malcolm Hunt Associates

- expertise as a planner familiar with the RMA planning system in New Zealand and expertise in the development of wind farms;
- familiarity with the above mentioned reports, evidence, and planning documents; and
- familiarity with the site and surrounding area.

19. I confirm I am familiar with the site and surrounding area. On 1 May 2016 I undertook a specific site visit accompanied by Mr Willis.

Scope of Evidence

20. My evidence addresses the following matters:

- Consent requirements and activity status
- Nature and extent of effects of the proposed activity
- Summary of relevant planning documents and key provisions
- Evaluation under Part II of the RMA
- Consent conditions

S.42A Report & Submissions

21. I have reviewed the s.42A Report including the technical appendices and summary of submissions. Except where stated otherwise in my evidence I agree with the evaluation and recommendations set out in the s.42A Report.

22. I have relied on the summary of submissions for capturing the content of the submissions. I note the issues raised in the submissions in opposition to the proposal are consistent with concerns raised in most wind farm applications in New Zealand to date.

Key issues

23. Having regard to the s.42A Report and my own experience with consenting wind farms in New Zealand, I consider the key issues required to be evaluated are:

- Activity classification and status
- S.104 and 104D considerations in terms of:
    i. Benefits of the proposal

ii. Adverse effects of the proposal in terms of landscape and amenity values. I note the proposal will generate additional actual or potential environmental effects I consider less relevant to the overall assessment of the application relate to: health and safety; avi-fauna (bird-strike); aviation safety; geotechnical considerations; temporary effects from construction activities; effects on drinking water; effects on farm animals.

iii. Relevant policy documents and respective weightings.

iv. Other matters including: precedent and the consent lapsing period. A number of submitters have raised the following other matters which I consider to be largely irrelevant to the assessment of the resource consent application: Project viability; Adequacy of consultation undertaken prior to notification; Property values; and Alternative site assessment.

- Appropriateness of consent conditions;
- Overall assessment under Part 2 of the RMA.

Application site and receiving environment

24. For the purposes of preparing this evidence I adopt the description of the site and the surrounding environment described in the application documentation and the s.42A Report.

25. I consider the following matters of particular relevance to my evidence and your considerations in respect of s104 and part 2 of the RMA:

26. The site is rural pastoral land with no significant environmental values (there are no matters of national importance or locally significant features/values affected by the proposal, unless you determine the subject land is located within the coastal environment).

- The site is not affected by any significant natural hazard risks.
- The site is located in close proximity to a small rural community (Waitati/Blueskin Bay).
- The site is located in close proximity to an existing electricity distribution network (about 500m).
- The site is accessible with limited roading improvements required to facilitate the development.

The proposal

27. For the purposes of preparing this evidence I adopt the description of the proposal as described in the application documentation and the s.42A Report, except for the reference to the Gamesa wind turbines (as discussed in Mr Scott's evidence the wind turbines are now likely to be a similar model supplied by Enercon).

28. I observe the following matters of particular relevance to my evidence:

- The proposal is of national significance. This is confirmed in the NPSREG, which recognises that **regardless of scale** the contribution of renewable electricity generation plays a vital role in the wellbeing of New Zealand, its people and the environment. In particular, central government has reaffirmed its strategic target of producing 90% renewable electricity generation by 2025.
- The wind farm will connect to the local distribution network administered by OtagoNet[4] (the proposal will not connect to the national grid as stated in paragraphs 4 and 45 of the s.42A Report). Details of the supporting infrastructure (33kv line network) required to connect the wind farm to the distribution network is provided in the resource consent application (pp12-13). Specifically, all but 100m of the line is proposed to be located underground. While the location of the transmission connection is yet to be confirmed, the activity is permitted. It is also typical of wind farm proposals to be consented separately to the transmission connection.
- The applicant is seeking a 10 year lapse period.

STATUTORY ASSESSMENT MATTERS

Activity Classification

29. I concur with the findings in the s.42A Report that:

- the rules in the PDP are irrelevant in terms of determining the status of the application;
- under the ODP, the proposed activity is best described as a 'utility' and the activity status is **Non-Complying under Rule 22.5.4**;

[4] OtagoNet is the electricity network services provider for most of Otago.

30. The reason for the Non-Complying activity status is fundamentally because wind farms (or any electricity generation activity) are not specifically identified in the ODP as a permitted, controlled or discretionary activity.

31. Notwithstanding the above, it should be acknowledged that, in respect of renewable electricity generation activities, the ODP is outdated and does not give effect to the NPSREG. I am acutely aware of this from discussions with DCC staff when they asked me (while at NZWEA) to review draft provisions of the PDP relating to the NPSREG and provision for wind energy. The NPSREG requires district plans to, among other things, provide for renewable electricity generation activities including small and community-scale renewable electricity generation activities. In respect of the NPSREG, the proposal is classified as a small and community-scale distributed renewable electricity generation activity:

> ***Small and community-scale distributed electricity generation*** *means renewable electricity generation for the purpose of using electricity on a particular site, or supplying an immediate community, or connecting into the distribution network.*

32. The PDP was notified on 26 September 2015 and attempts to specifically provide for wind energy development as directed by the NPSREG. I address the PDP objectives and policies later in my evidence. However, for the purposes of defining the activity classification I note that under the PDP the proposal is defined as a "wind generator – community scale" and is provided for as a discretionary activity under rule 5.3.2.

> *Wind Generators - Community Scale*
>
> *Renewable energy generators that generate energy using wind resources that do not exceed a) five wind turbines, each with a maximum height, measured from base of mast to upper point of blade, of 85m, Or b) three wind turbines, each with a maximum height, measured from base of mast to upper point of blade, of 125m.*
>
> *Wind Generators – community scale are a sub-activity of large scale network utilities.*

33. The Council released a memorandum on 19 January identifying the PDP provisions which are to be considered operative in accordance with s86F of the RMA. The memorandum stated, among other things:

> *A review of submissions was undertaken to identify rules that did not receive submissions in opposition to them, and, therefore, must be treated as operative in accordance with s86F. This review considered submissions against rules in the context of how the plan provisions were related and reliant on each other (e.g. activity status rules that were linked to performance standards, and how the rules were linked to policies and objectives). In determining which rules should be considered operative, if a rule was not able to 'stand-alone' and be*

used without the need for related provisions that were not operative due to submissions in opposition, the rule was also considered to be not operative as a consequence.

In general, this meant:

• Where objectives and policies were opposed, the associated rules were considered as not operative, because a consequential change to amending the objective or policy (if the submission was accepted) would require the associated rule to be changed.

• Where rules relied on new definitions that had submissions i n opposition, the rules were also considered as not operative. Where activity status rules were linked to new or revised performance standards that had submissions in opposition, those activity status rules were considered as not operative, unless it was considered that the rules could stand on their own alongside the still operative parts of the operative plan.

• Where submissions challenged the application of an entire zone or overlay zone (for example for Dunedin Hospital, Taieri Aerodrome, and Otago Museum, General Residential 2 zones, and some Hazard overlay zones) the whole section was considered as not operative.

34. The memorandum does not identify any of the provisions relating to wind farms as being operative.

Part 2

35. An overall evaluation of the proposal is required to establish its merits. In my opinion the Part 2 assessment should be informed by the assessments carried out under s.104. I agree with the finding in paragraph 160 that the following Part 2 matters apply to the assessment of this application:

- 5(2)(a) "Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations;
- 5(2)(c) "avoiding, remedying or mitigating any adverse effects of activities on the environment",
- 7(b) "The efficient use and development of natural and physical resources";
- 7(c) "The maintenance and enhancement of amenity values"; and
- 7(f) "Maintenance and enhancement of the quality of the environment"
- 7(j) "The benefit to be derived from the use and development of renewable energy"

36. I also consider the following Part 2 matters apply:

- 5(2)(b) "safeguarding the life-supporting capacity of air, water, soil, and ecosystems"
- 8 "taking into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)".

37. I assess the above matters in my evidence below.

Section 104

38. Section 104 lists criteria that resource consent applications for non-complying (and discretionary) activities are required to be assessed against, subject to Part 2.

39. I have carried out an assessment of the relevant s104 matters later in my evidence.

Permitted Activities

40. In respect of s.104(2) I consider you can disregard the effects of the following activities as the effects of them are permitted by rules in ODP:

- Construction, operation and upgrading of the lines and any necessary incidental equipment associated with the transmission and distribution of electricity from the proposed wind farm to the distribution network (permitted by rule 22.5.1).
- Earthworks for the purpose of constructing and maintaining access within the farm (permitted by rule 6.5.2(i)).

Relevant policy documents and provisions

41. In my opinion the statutory policy documents identified in section six of the s.42A Report apply to the assessment of this resource consent application. These being:

- NPSREG[5];
- RPS; and PRPS;
- ODP; and PDP.

42. I note the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health ('NES') is not relevant for the reasons provided in paragraph 18 of the s.42A Report.

[5] I note there is no environmental standard relating to the management of wind farms in New Zealand (I assume paragraph 159 of the s.42A Report intended to refer to the NPSREG).

43. In my opinion the NZCPS will be relevant if the proposed activity is located within the coastal environment. In this case there is uncertainty as to whether or not the NZCPS applies (the coastal environment is not mapped or defined and the evidence of Ms Lucas (who states the site is within the coastal environment) conflicts with the s.42A Report (including the landscape review by Mr Knox) and evidence of Mr Moore (who state the site is not within the coastal environment). In my opinion the NZCPS is not particularly relevant to the assessment of the application (refer paragraph 91 of my evidence). However, to recognise the national importance of the coastal environment (s.6a and the matters stated in the NZCPS) and to err on the side of caution, I have assessed the proposal against the NZCPS.

44. **Appendix BF1** of my evidence lists the provisions within the relevant policy documents I consider relevant to the assessment of this application. I note compared to list of provisions in the s.42A Report I have identified some different provisions as being relevant.

Section 104D(1)

45. Section 104D(1) provides a two limb "gateway test" that must be passed before an application can be granted. To pass the gateway <u>one</u> of following must occur:

- the adverse effects the proposal on the environment must not be no more than minor (s.104D(1)(a));

OR

- the proposal must not be contrary to the objectives and policies of the ODP and the PDP (s.104D(1)(b).

46. In this case the resource consent application passes the objectives and policies limb because the proposal is generally consistent and in no way contrary to the objectives and policies of the ODP and the PDP, as discussed later in my evidence.

47. In respect of s.104D(1)(b), there is both an operative plan and proposed plan, therefore it is necessary to consider this proposal against both documents (s.104D(1)(b)(iii).

ENVIRONMENTAL EFFECTS

Benefits

48. In addition to the benefits identified in the s.42A Report and the evidence of Mr S Willis, it is important to recognise the benefits of the wind farm in terms of Policy A of the NPSREG:

> *Decision-makers shall recognise and provide for the national significance of renewable electricity generation activities, including the national, regional and local benefits relevant to renewable electricity generation activities. These benefits include, but are not limited to:*
>
> *a) maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions;*
>
> *b) maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation;*
>
> *c) using renewable natural resources rather than finite resources;*
>
> *d) the reversibility of the adverse effects on the environment of some renewable electricity generation technologies;*
>
> *e) avoiding reliance on imported fuels for the purposes of generating electricity.*

49. The above benefits are discussed further on pages 33-40 of the NPSREG Technical Guide (attached as **Appendix BF2**), including the following specific benefits associated with wind farms:

> *Electricity generated from wind resources utilises an abundant resource which is yet to be fully utilised*
>
> *New wind generation, together with geothermal, will contribute to a more balanced portfolio of renewable generation technologies, reducing the electricity sector's exposure to dry year risk. This is because wind generation is very reliable over the longer term (month to month and year to year); it is much less variable than hydro inflows. In the short term, hydro-electricity generation with storage can be used to provide generation flexibly to respond quickly to wind energy variability without incurring large operating costs*
>
> *Wind generation can be usefully forecast. While wind is variable over the short term, it is predictable and less variable than hydro. This makes managing wind variability in the short term easier, as increases and decreases in wind generation can be forecast hours and days ahead with useful accuracy. Short-term wind variability can also be reduced by developing geographically diverse wind farms. Having wind farms in different wind regions means that while one may not be generating, another might be, thus having a smoothing effect on overall national generation from wind*
>
> *Wind farm developments can co-exist with other land uses such as agricultural activities creating sustainable, mixed land use.*
>
> *Turbines can attract tourism and provide recreational opportunities such as mountain bike tracks or hiking within wind farm locations*
>
> *Maintenance of wind farms can be carried out with minimal disruption to electricity generation (unlike some other types of power stations) as*

a single turbine can be repaired without requiring a whole wind farm to cease generation.

50. In my opinion the NPSREG requires you to clearly and deliberately demonstrate that you have considered these benefits, as a matter of national significance, when weighing up your obligations under s.104, subject to Part 2.

51. In addition to the above, NZWEA has published a factsheet on the particular benefits of wind farms. That fact sheet is attached at **Appendix BF3**. In my opinion the benefits identified in that document are relevant to this application.

Effects on amenity values

52. In my opinion the impact of the proposed wind farm on peoples' amenity values is the most contentious issue to be evaluated in this case.

53. There are two effects on peoples' amenity values arising from the proposal that need to be given particular attention: noise effects and visual effects.

Noise effects

54. I acknowledge that, if heard, sound from wind turbines can be perceived as an adverse effect depending on the perception of the person hearing the sound. In my experience, provided sound from wind turbines remains within the noise limits recommended in NZS6808, the sound will not be unreasonable and effects arising are no more than minor.

55. From reviewing the technical report prepared by Malcolm Hunt + Associates and the evidence of Dr. Chiles I consider the operation of the wind farm will generate, in various weather conditions, sound that is perceptible to people living and working near the wind farm but this sound can comply with the noise limits set out in NZ6808.

56. The evidence of Dr Chiles demonstrates that the noise generated by the wind turbines will meet the limits set out in NZS6808. The level of noise is deemed by the acoustic experts to be reasonable, on the basis that:

- The receiving environment is a rural working environment.
- NZS6808 sets noise limits designed to provide protection from sleep disturbance and to maintain reasonable residential amenity.
- NZS6808 provides the appropriate basis for assessing potential noise effects from the proposed Blueskin wind farm.

- Consent conditions can ensure that noise effects can be appropriately avoided, remedied and mitigated throughout the life of the wind farm.

57. In my opinion it is appropriate that consent conditions be imposed to manage noise effects as recommended in the s.42A Report and amended in the evidence of Dr. Chiles.

Visual effects

58. From reviewing the summary of submissions and as highlighted in the s.42A Report it is clear there are some polarised opinions about the impact the proposal has on visual amenity values.

59. The s.42A Report, based on the submissions received and evidence of Ms Lucas and Mr Knox identifies that the visual effects of the wind farm will be no more than minor except for the residents living along Pryde Road (Claytons, Ryans and Cardy/Pickford). I accept that assessment.

60. I consider the adverse visual effects on the Pryde Road parties to be more than minor, primarily because:

- the turbines will appear very prominent when viewed from specific locations on their respective properties;
- this will affect their existing views by changing the character of their visual setting (from some locations on their property); and
- these submitters have stated they do not 'like' this change.

61. While the visual effects may be considered more than minor on these parties, I do not consider the adverse extent of these effects to be significant or unacceptable so as to require consent to be declined. In this regard, the following factors reduce the visual impact on these parties:

- The dwellings located on the three properties are orientated north-northeast, not south towards to the wind farm site.
- The turbines will be largely screened from view from the Cardy/Pickford and Ryan dwellings (the Ryan dwelling due to topography and the Cardy/Pickford dwelling due to existing vegetation).
- While prominent, only parts of one or two turbines will be visible from the properties due to the existing topography and proximity of the properties.

- As assessed by Ms Lucas and Mr Moore, the turbines will introduce a new aspect to the landscape which will be elegant and meaningful with the wind farm resulting in predominantly positive landscape and visual effects due to the sculptural landmark character and associative value as a sustainable community project.

62. In addition to the above, I consider the visual effects in terms of glare and blade glint can be satisfactorily avoided, remedied or mitigated by ensuring the wind turbines are painted a matte light grey or off-white colour as is proposed.

63. I also consider any actual or potential shadow flicker effects can be appropriately avoided, remedied or mitigated through the imposition of consent conditions, as recommended in the s.42A Report.

Landscape effects

64. The proposal has been assessed by independent landscape experts Ms D Lucas, Mr Knox, and Mr Moore as having no more than a minor adverse effect on landscape values overall.

65. I have no reason to doubt the above conclusions. The only permanent effect on the natural landscape will be from the access tracks. The proposal is relatively small scale compared to other wind farms and the site is not located within a significant landscape setting. I note other wind farm proposals of much larger scales in more sensitive landscape settings have been consented under the RMA[6].

Other actual, potential or perceived environmental effects

66. For the reasons set out in the s.42A Report I consider the actual and potential effects on the following matters can be satisfactorily addressed through consent conditions and will be no more than minor:

- Health and safety;
- Bird-strike;
- Aviation safety;
- Geotechnical considerations;

[6] For example the following windfarms have been consented on sites within the coastal environment and/or afforded outstanding natural landscape values: Awhitu (2005); Waitahora (2010); Puketoi (2013); Westwind (2009); Mt Cass (2011); Flat Hill (2013)

- Temporary construction effects;
- Effects on drinking water; and
- Effects on farm animals.

Health and safety

67. As a decision-maker on this resource consent application under the RMA, I consider you must ensure people's health and safety is provided for. In my experience potential causes for human health effects associated with wind turbines arise from:

- construction and operational health and safety concerns; and
- sleep disturbance associated with wind turbine noise.

68. In my experience credible scientific literature has found no direct links between wind turbines and adverse human health effects, for example:

> *There is no reason to believe, based on the levels and frequencies of the sounds and...sound exposures in occupational settings, that the sounds from wind turbines could plausibly have direct adverse health consequences*[7].
>
> *... there is no scientific evidence that noise at levels created by wind turbines could cause health problems other than annoyance...*[8]
>
> *The perception of noise depends in part on the individual - on a person's hearing noise. For example, a persistent "whoosh" might be a soothing sound to some people even as it annoys others."*[9]

69. In my experience potential health effects from noise are generally and best addressed through ensuring compliance with the New Zealand Standard for wind farm noise, NZS6808:2010 Acoustics - Wind farm noise, international standards relating to magnetic fields, and avoiding, remedying or mitigating potential effects of shadow flicker and blade glint.

70. Additionally, in my experience the Environment Court has been satisfied that:

- the effects on a person's health from wind turbine noise will be no more than minor provided the limits in NZS6808:2010 are met;
- a person's health will not be impacted from electric and magnetic fields created by transmission cables provided well known international standards are met;

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[7] Colby et al. (2009): Wind turbine sound and Health Effects: An Expert panel review
[8] Pedersen(2003) Noise annoyance from wind turbines review for Swedish Environmental protection Agency
[9] National research Council (USA) (2007): impact of wind energy development on humans

- occupational health and safety risks can be suitably avoided, remedied and mitigated through operational safety management procedures;
- wind turbines do not cause any vibration that can adversely affect human health;
- annoyance caused by glare and blade glint can be mitigated by painting turbine blades a matte light grey or off-white colour to minimise glare;
- annoyance from shadow flicker can generally be monitored and avoided or mitigated if required (as is proposed);
- generally, most people will adapt to their environment to a large extent and any adverse effects of wind turbines on peoples well-being are no more than minor.

Bird-strike

71. In this case the expert evidence before you assesses the potential adverse effects on avi-fauna as being no more than minor. Opportunities exist to enhance bird habitat and for pest management to occur through BRCT's activities. However, in my opinion the effect of bird strike does not require specific mitigation, especially to the extent being recommended in the s.42A Report which I consider to be unnecessary and onerous given the modest scale of this proposal.

72. Notwithstanding the above the applicant is willing to accept a bird strike monitoring and reporting regime as a consent condition, inclusive of the ability for the wind farm operation to be reviewed should adverse effects on birds be identified as part of the monitoring regime. In my opinion this represents an example of best practice.

73. I note, in my experience, a number of wind farms in New Zealand are monitored to record bird mortalities. I understand the monitoring results have demonstrated that wind farms appear to cause limited bird strike and there is no evidence of any significant adverse effects on bird populations.

Telecommunications

74. Wind turbines can potentially interfere with local radio, television and microwave communications in the immediately surrounding area. Such effects are routinely assessed and managed as part of any wind farm development.

75. I understand interference can potentially be caused by four distinct mechanisms:

- electromagnetic noise, whereby the wind turbine generator's electrical and electronic equipment is radiated in a frequency-band used by a radio service
- modification of an antenna's radiation pattern where a wind turbine is in close proximity
- obstruction of a radio path by a wind turbine, which attenuates the amount of radio signal received
- reflection (scatter) from a wind turbine, which can cause echoes of radio signals to be received along with the direct signal. These 'ghost' signals can cause distortion and noise.

76. In this case, based on the submissions received I am not aware of any actual tele-communication network that will be affected by the proposal. I acknowledge a number of submissions raise concern about the impact on "wireless radio communication" but I am not aware specifically which wireless radio communications might be affected and how.

77. I concur with the recommendation in the s.42A Report that any actual effects on communications can be managed via consent conditions and will be no more than minor.

Aviation safety

78. In my experience aviation effects are typically addressed through meeting the CAA regulatory requirements and consultation with any aviation stakeholders in the early stages of the wind farm development process.

79. Aviation safety is discussed in paragraphs 81-82 of the s.42A Report and I agree the conditions requested by Airways are appropriate except for the request for the wind turbines to be coloured white. In my experience, the majority of wind turbines in New Zealand are coloured "off-white" and this has been acceptable to the CAA in the past.

80. In this case CAA has confirmed that any aeronautical issues can be managed via turbine colour and night lighting and Airways has advised that no radar interference issue will arise. I have attached advice from CAA regarding turbine colour and lighting (**BF4**) and from Airways regarding radar

interference (**BF5**). In my opinion no further conditions are required to address aviation safety matters.

Geotechnical considerations

81. In my experience geotechnical considerations are easily dealt with through the detail design process and ensuring the wind turbine foundations and construction techniques implement any particular recommendations identified in site specific geotechnical investigations. In this case the applicant and Council engineers have provided technical advice expressing confidence the site is sufficiently stable to accommodate the development.

Temporary construction effects

82. In this case Council engineers have provided technical advice expressing confidence that the transportation effects will be no more than minor provided the consent is subject to a number of consent conditions and advice notes. I have no reason to doubt the conclusion reached in paragraph 118 of the s.42A Report in regard to transportation effects.

83. In addition to transportation effects, I consider construction of the wind farm is of such a minor scale that the proposed earthworks will not give rise to any discernible adverse effects arising from dust, erosion and sediment control, particularly compared to permitted rural activities that can occur on the site (e.g. ploughing).

Effects on drinking water

84. I am not aware that the proposed wind farm will adversely affect the supply of drinking water. The geotechnical evidence from Virginia Toy indicates that there is not likely to be any interference with groundwater on the site.

Effects on farm animals

85. In my experience effects on farm animals are negligible because animals readily acclimatise to operating wind turbines. I am not aware of any credible evidence suggesting that wind farms create significant adverse effects on farm animals.

RELEVANT POLICY DOCUMENTS

Assessment of relevant provisions

NPSREG

86. The s.42A Report deals with the NPSREG in one paragraph stating that the proposal is consistent with policies B, C1 and E3 of the NPSREG and it is not inconsistent or contrary with the policy statement. In my opinion it is appropriate to give the NPSREG greater recognition than this.

87. As stated in the NPSREG Implementation Guidance document, the NPSREG confirms that:

- renewable electricity generation (REG), regardless of scale, makes a crucial contribution to the well-being of New Zealand, its people and the environment;
- the development, operation, maintenance and upgrading of new and existing REG activities throughout New Zealand, and the associated benefits of REG, are matters of national significance;
- local authorities are required to adopt a positive and proactive policy response to REG activities;
- in assessing resource consent applications decision-makers are required to recognise and provide for the cumulative national, regional and local benefits of REG activities
- in assessing resource consent applications decision-makers are required to have particular regard to the practical implications of achieving New Zealand's renewable electricity target and the constraints associated with developing, operating, maintaining and upgrading new, existing and consented REG activities
- Two principal reasons underlay the development of the NPS REG. First, a significant increase in the proportion of electricity generated from renewable resources will be required to achieve the Government's target of 90% of electricity from renewable sources by 2025, and to maintain security of supply. Second, renewable electricity generation is being unduly impeded by variable provisions in local authority policies and plans and changing attitudes to the environmental effects of development associated with REG activities. In response, the NPS REG

seeks to ensure that: the relevant benefits of REG and the national significance of associated activities are more explicitly recognised in policy development and consenting processes delivered under the RMA; REG activities are recognised and provided for in resource management policies and plans; and a more consistent national approach is applied to REG activities within the resource management planning framework.

88. The provisions of the NPSREG of particular relevance to this application are the Objective and Policies A, B, C1 and C2. These provisions require you to "have regard to" the matters identified. This means you must give genuine attention and thought to the relevant matters identified, and must decide what weight they are to be given in the particular circumstances. I understand the weight to be given to them is neither predetermined relative to other matters that you are also obliged to "have regard to" under s104 nor lessen the obligation to apply the provisions of Part 2.

89. I address the Objective and Policies A, B, C1 and C2 below. In my opinion the proposal is entirely consistent with the NPSREG:

- The Dunedin City Council has recognised the benefits of this type of activity by proactively provided for community scale wind farms in the PDP and the proposal will contribute to the national energy target of sourcing 90% of its electricity supply from renewable energy sources.
- The proposal will contribute to all the benefits listed in Policy A.
- Policy B(a) and (b) apply to existing renewable energy activities and is not relevant to the assessment of this application.
- Policy B(c) identifies that meeting or exceeding the New Zealand Government's national target for the generation of electricity from renewable resources will require the significant development of renewable electricity generation activities. While the proposal will contribute relatively small additional renewable electricity supply to New Zealand as a whole, this contribution is to be recognised as a matter of national significance. I consider the contribution to be significant in that it will increase the diversity and security of local electricity supply, making the Dunedin district more resilient. The proposal is also significant in that it will be New Zealand's first community initiated and owned wind farm, and one of two in Australasia. If successful, I anticipate the proposal will encourage (or at least help pave the way) for other community scale

renewable energy developments to be established throughout New Zealand (and potentially other parts of the world).

- Policy C1(a) recognises that REG activities must be located where the resource is available. In this case the applicant has investigated a number of alternative site locations and determined that the wind resource is available at the proposed site. It is important to recognise that the resource must be "available", which includes the ability for the wind farm operator to access and secure land tenure arrangements for the subject land. In applying policy C1(a) there is no requirement for the site to be the "best site" (although in this case the applicant believes it is).
- Policy C1(b) recognises there are logistical or technical practicalities associated with developing, upgrading, operating REG activities. In my opinion this matter is particularly relevant to your consideration of the consent conditions, submissions raising concern about the feasibility of the proposal, and the consent lapse period. Specifically, it is difficult for the applicant to nail down precise details of the wind farm proposal prior to resource consent being issued as the overall feasibility of the project is driven by the applicant and suppliers respective assessments of various commercial, technical, and environmental considerations. For each of these considerations a number of practical constraints apply. A summary of the generic practical constraints associated with wind farms is summarised in the NZWEA factsheet attached as **Appendix BF6**.
- Policy C1(c) identifies the location of existing infrastructure including roads and the distribution network as a practical constraint. Generally speaking the greater the distance from major roads and the distribution network the greater the cost of supplying electricity. In this case, the site is located very close to major roads and the distribution network, which is a significant factor in the overall feasibility of the project, particularly compared to other sites investigated.
- Policy C1(d) and (e) are particularly relevant in this case. In my opinion they allow you to give the wind farm proposal the benefit of any doubt if you have some uncertainty about the potential environmental effects of the proposal, for example operational noise effects. More specifically, if you have doubt or concerns about some operational effects of the

proposal then you can utilise Policy C1(d) to support the imposition of consent conditions to help address those potential effects.

- Policy C2 applies if the proposal has residual environmental effects (those that cannot be avoided, remedied or mitigated) and requires you to have regard to offsetting measures or environmental compensation including measures or compensation which benefit the local environment and community affected. The intent of this policy is to ensure you consider offsetting or compensation measures offered by the applicant – it does not exist to require offsetting or compensation if residual effects are identified. In this case the proposal as a whole is a considerable offering to the local community (in terms of electricity supply and resilience) and no specific environmental offset or compensation has been contemplated on the basis that there are no significant residual environmental effects on the environment.

NZCPS

90. I consider the proposal to be generally consistent with the NZCPS. In this regard:

- The proposal will enable people and communities to provide for their social, economic, and cultural wellbeing and their health and safety. In doing so the NZCPS (objective 6 and policy 6) recognise among other things that the coastal environment contains significant renewable energy resources and the protection of the values of the coastal environment does not preclude use and development in appropriate places and forms.
- The proposal can be considered a strategically planned development. It has also been planned for almost a decade with significant input from the local community and Dunedin City Council. Moreover, the proposal is in close proximity, and will be connected, to the local road and electricity distribution networks.
- The proposal will not prevent or adversely affect the safeguarding of the integrity, form, functioning and resilience of the coastal environment or impact the sustainability of ecosystems within the coastal environment.
- While the turbines will be visible and introduce additional built elements to the landscape, there are no specific natural character or landscape

values identified as being particularly significant that are adversely affected by the proposal. Moreover the proposal will not prevent the preservation of the natural character of the coastal environment (if the turbines are located within the coastal environment it is only located on the periphery of the costal environment) and will generally maintain the natural hilltop and open space qualities of the coastal hill backdrop.

- Runanga support the proposal and no concerns have been raised in relation to the Treaty of Waitangi.
- The proposal is not subject to or will extenuate any discernible coastal hazard risks.
- The proposal does not affect water quality; historic heritage; public open space qualities and recreation opportunities of the coastal environment; or any international obligations regarding the coastal environment.

91. Notwithstanding the above, in my opinion the NZCPS is not particularly relevant to the assessment of the application given:

- The s.42A Report (including the landscape review by Mr Knox) and Mr Moore consider the proposal is not located within the coastal environment;
- The wind turbines will be located outside the North Coast Coastal Landscape Preservation Area;
- The site is not afforded any significant landscape value and adverse landscape effects have been assessed as being no more than minor;
- The subject land does not contain any coastal escarpment or other distinctive coastal feature such as coastal vegetation or habitat of indigenous coastal species;
- The subject land has no coastal margins and does not contain significantly active coastal processes, influences or qualities;
- The subject land is not known to provide or present a strong link/relationship between tangata whenua and the coast.

RPS and PRPS

92. In my opinion the proposal is consistent with the relevant objectives and policies of the RPS and the general intent[10] of the relevant objectives and policies in the PRPS. In this regard:

- The proposal is a sustainable and efficient use and production of energy that takes into account community values and expectations and will have appropriate benefits for Otago's communities while avoiding, remedying or mitigating adverse effects on Otago's communities and environment resulting from the production and use of renewable energy. This is consistent objectives 12.4.1, 12.4.2, and 12.4.3 and polices 12.5.2 and 12.5.4 of the RPS and objectives 3.4, 3.5, 3.6 and polices 3.4.1, 3.4.2, 3.5.1, 3.5.2, and 3.6.2[11] of the PRPS.
- Runanga have been involved in and support the proposal. This is consistent with a suite of objectives and policies throughout both the RPS and PRPS.
- The proposal promotes the sustainable management of Otago's land resources in order to help maintain and enhance the primary productive capacity and life-supporting capacity of land resources; and to meet the present and reasonably foreseeable needs of Otago's people and communities. This is consistent with objective 5.4.1 and polices 5.5.3 and 5.5.4 of the RPS.
- Many provisions in the RPS and PRPS direct decision-makers to identify and protect outstanding or significant natural environmental values. In this case the subject land is not recognised as containing any outstanding or significant natural or other environmental values.
- The proposal will avoid, remedy or mitigate any actual or potential degradation of Otago's natural and physical resources resulting from activities utilising the land resource. This is consistent with policy 5.4.2 of the RPS.

[10] The precise wording of the objectives and policies are subject to change but I consider it is appropriate to assess the proposal against the general intent of the provisions relevant to this application.
[11] I understand the intent of policy 3.6.2 of the PRPS is to capture small and community scale renewable electricity generation activities, not just small scale. This is on the understanding that community scale renewable electricity generation activities increase the local community's resilience and security of supply, whereas 'small scale' does not.

- There are no relevant provisions in the RPS and the PRPS that specifically seek to protect amenity values from the development of renewable energy development (other than general references to 'avoid', 'remedy' or 'mitigate' adverse effects).

93. I note I agree with the s.42A Report that chapter 12 of the RPS and objective 3.6 and policy 3.6.2 of the PRPS lend support to the proposal. However, contrary to the s.42A Report I do not consider the objectives and policies in Chapters 9 (built environment) and 11 (natural hazards) are relevant to the consideration of the proposal. Chapter 9 relates to the built environment (urban/town settlements) and is not intended to apply to rural land areas. In my opinion Chapter 11 is not relevant because the wind farm is not susceptible to any significant natural hazard risk.

94. In addition to the above, I consider policy 2.2.7 of the PRPS is relevant in that it can be used by you to help identify whether or not the subject land is within the coastal environment:

> *Policy 2.2.7 Identifying the landward extent of the coastal environment*
>
> *Identifying the landward extent of the coastal environment, using the following criteria:*
>
> *a) Area or landform dominated by coastal vegetation or habitat of indigenous coastal species; and*
>
> *b) Landforms and the margins of landforms where active coastal processes, influences or qualities are significant; and*
>
> *c) Any landscapes or features, including coastal escarpments, which contribute to the natural character, visual quality or amenity values of the coast; and*
>
> *d) Any physical resource or built form, including infrastructure, that has modified the coastal environment and retains a connection to or derives character from connection to the coast; and*
>
> *e) The relationship of takata whenua with the coastal environment.*

ODP

95. The s.42A report provides a detailed assessment of the objectives and policies of the ODP. I have reviewed this assessment and generally concur with it, with some exceptions, as discussed below.

96. I agree the proposal is generally consistent with objectives 4.2.1 and 4.2.4 and supporting policies 4.3.2, 4.3.5, and 4.2.4 in relation to sustainability. This is because the proposal, having particular regard to the expert landscape evidence and numerous supporting submissions, will generally maintain the districts rural resources (including landscape values) to a level that is

commensurate with the local, regional and national benefits and significance of the proposed wind farm (a physical resource that in this case is required to be located on rural land).

97. I agree the proposal is consistent with objective 5.2.1 and policy 5.3.2 in relation to the treaty of Waitangi. Runanga have provided input into the proposal and are keen supporters of it.

98. I agree the proposal is consistent with objective 6.2.1 and policy 6.3.1 in that it will directly and support and complement the existing rural production activities occurring on and anticipated for the land. This is a benefit of the proposal.

99. I agree the proposal is generally consistent with objectives 6.2.2, 6.2.4 and 6.2.5 and polices 6.3.5, 6.3.8, and 6.3.12. Unlike the s.42A Report I consider the proposal is 'generally inconsistent' (as opposed to flat out 'inconsistent') with policy 6.3.6 and I consider the proposal is not inconsistent with policy 6.3.11. In my opinion:

- Wind farms are most appropriately located in the rural zone compared to any other zone (I agree with the s.42A finding on this point);
- Residual visual effects will occur on adjoining and neighbouring properties and these will be more than minor. However, the proposal will avoid, remedy or mitigate adverse effects on the amenity values of adjoining properties. Amenity values comprise a suite of elements, including noise and visual effects. Noise effects can be avoided, remedied or mitigated to an extent that is no more than minor. Visual effects in the form of shadow flicker are considered to be negligible and visual effects from glare can be mitigated through controlling the appearance of the turbines.
- There is no requirement in polices 6.3.6 and 6.3.11 to avoid, remedy, or mitigate the adverse effects of the proposal to the satisfaction of neighbours (which appears to be the position of taken in the s.42A Report). Policy 6.3.6 seeks only to avoid, remedy, or mitigate effects on amenity values and policy 6.3.11 applies to all effects, not just neighbouring amenity values.
- I do not agree the proposal will give rise to "locally significant" adverse impacts on amenity values. This ignores the local residents who support

or do not oppose the wind farm. It also implies that all effects on amenity values (including noise) will be significant, which they will not. In the context of policy 6.3.6 I consider it is more appropriate to recognise that the visual effects of the proposal will be significant on some but not all neighbours. As identified by Mr Moore whether those effects are adverse will depend on the person.

- I agree the proposal is consistent with Objective 22.2.2 and policies 22.3.1, 22.3.2, and 22.3.5 for the reasons given in the s.42A Report. In respect of policy 22.3.3 I observe the proposal is to underground the majority of the transmission line connecting the wind farm with the 33Kv OtagoNet network.
- I agree the proposal is consistent with Objectives 20.2.1, 20.2.2, and 20.2.4, and policies 20.3.1, 20.3.4, 20.3.5, and 20.3.8 for the reasons given the s.42A Report.

100. In my opinion the proposal accords with objective 21.2.2 and policy 21.3.3. I do not agree the s.42A Report that the proposal is inconsistent with these provisions. In my opinion the proposal, subject to adherence to consent conditions, will not give rise to any unreasonable effect on the health and safety of people and communities. I note all operational effects of the proposal in terms of noise and glare can be managed via consent conditions and made subject to review (as is recommended in the s.42A Report).

PDP

101. The s.42A report provides a detailed assessment of the objectives and policies of the PDP. I have reviewed this assessment and generally concur with it, with some exceptions, as discussed below.

102. I agree the proposal is consistent with objectives 16.2.1, 16.2.3, and 16.2.4 and policies 16.2.1.10, 16.2.3.8, and 16.2.4.4 relating to development and activities in the rural zone, for the reasons provided in the s.42A Report. I would add the proposed wind farm will benefit and complement the productive capacity of the rural resource.

103. I agree the proposal is consistent with objective 6.2.3 and policy 6.2.3.1 and 6.2.3.3 in relation to transport for the reasons provided in the s.42A Report.

104. For the reasons provided in the s.42A report I agree the proposal is generally consistent with objective 5.2.1 and policies 5.2.1.5 and policy 5.2.1.11 and consistent with policy 5.2.1.7 relating to utilities.

105. For the reasons provided in the s.42A I agree the proposal is consistent with objective 14.2.1 and policy 14.2.1.2 in relation to manawhenua.

Conclusion on ODP and PDP provisions

106. In my opinion the proposal generally accords with the policy direction set out in the relevant objectives of both the ODP and the PDP. It is certainly not contrary to the suite of objectives and policies in either plan.

107. In terms of assessing the ODP and PDP objectives and policies in relation to the application of s.104D(a)(iii), I think it is appropriate that you:

- Recognise this application would be for discretionary activity under notified provisions of PDP therefore s104D would not be relevant;
- Recognise the ODP provisions do not contemplate community scale renewable electricity generation activities whereas the general intent of the PDP provisions is to provide for community scale renewable electricity generation activities.
- In terms of applying provisions which seek to avoid, remedy, or mitigate adverse effects on the environment (including amenity values), recognise that compared to the ODP the PDP introduces the qualifier 'as far as practical' in relation to REG activities. In my opinion this is a significant qualifier that appropriately recognises the benefits and practical constraints associated with REG activities, as directed in the NPSREG.
- From a statutory planning perspective, the NPSREG provides strong direction for the development of small and community-scale distributed renewable electricity generation activities, such as the Blueskin wind farm. I consider the ODP does not give effect to the NPSREG and in this case more weight can be given to the intent of the objectives and policies of the PDP, which more accurately reflects the regional and local government policy direction for renewable electricity generation activities as required by the NPSREG. This intent is to recognise and provide for the benefits of renewable electricity generation activities whilst ensuring adverse effects are avoided, remedied, mitigated, offset or compensated.

OTHER MATTERS

Other concerns raised by submitters

108. In my opinion a number of matters have been raised in submissions that are not relevant to your assessment of the application. These are discussed below.

Commercial viability

109. The financial viability of the project depends on a whole range of factors and I understand the Environment Court has repeatedly determined that the economic viability of a project lies in 'the boardroom' to be determined by the potential developer, and it is not for the Court or Council to determine the viability of a proposal. Notwithstanding this, I consider the commercial viability of wind farms has been proven as evidenced in the growth of the industry over the past twenty years and it is widely accepted that small and community-scale distributed wind farms such as that proposed have a significant part to play in meeting New Zealand's energy requirements.

Consultation carried out by the applicant

110. This matter is irrelevant to the assessment of your decision as the RMA does not require applicants on resource consent applications to carry out any consultation. In my experience the extent and nature of consultation carried out by an application is undertaken at the discretion of the developer and will vary from project to project. Notwithstanding the above I am surprised with the level of submitters commenting that the applicant has carried out inadequate consultation. In my experience the level of community engagement and consultation carried out by the applicant exceeds that undertaken as part of most other wind farm proposals carried out in New Zealand.

Property values

111. Some submitters perceive that their property values will diminish due to the wind farm. However, the perception of diminished property value is often from a subjective point of view and I am not aware of any credible evidence in New Zealand confirming that a wind farm has significantly affected the market value of a neighbouring property. Moreover, I understand the Environment Court has generally held that a diminution of property values is not a relevant RMA consideration.

Consideration of alternative sites

112. In my experience applicants for resource consents are not required to consider alternative sites unless it is likely the activity will result in a significant adverse effect on the environment. I have concluded that the effects of the proposal will not be significant and therefore no assessment of alternatives is required. In this case the proposal will not give rise to any significant adverse effect on the environment and therefore it is not necessary for the applicant to provide a description or assessment of alternatives sites.

Precedent

113. As a non-complying activity I agree with the s.42A Report that you should consider precedent as an 'other matter'. I also concur with the evaluation provided in the s.42A Report (paragraphs 172-181) that, in this case, any concerns raised by submitters regarding precedent should not be a reason for declining this application.

114. Moreover, if approving the consent application is going to set any precedent I consider it should be largely viewed as positive, given the strategic importance and benefits associated with the proposal.

10 year lapse period

115. I support the applicants request for a 10 year lapse period and consider this to be appropriate.

116. I do not agree with the s.42A Recommendation (paragraphs 139-140) to refuse the applicants request for a 10 year lapsing period.

> *[139] Consent is sought with a ten year lapse period that is where substantial progress must be made within ten years after the close of any appeal period (or after the conclusion of an appeal/mediation). In my opinion and based on the breadth of community interest, a ten year lapse period provides a high degree of uncertainty about whether the project will indeed proceed, or not. [140] It is my view a ten year lapse period is not appropriate. Five years provides sufficient duration for the applicant to access funding streams, develop plans and commence the project to the extent that substantial progress has been achieved, while providing a degree of surety for the community.*

117. I consider "the breadth of community interest" is not a satisfactorily reason for declining a 10 year lapse period. I am not aware of any submitter directly opposing the request for a 10 year lapse period.

118. In my opinion the benefits of and practical constraints associated with the proposal warrant a 10 year lapse period. In terms of the practical constraints I believe you should give particular regard to Policy C and C1 of the NPSRE.

119. I also consider it is not unusual for wind farm consents to have a lapse period of 10 years.

CONDITIONS

120. I have reviewed the conditions recommended in the s.42A Report. In my opinion the suite of conditions are generally appropriate for a wind farm of the nature and scale proposed.

121. If consent is granted, I consider a variety of minor amendments should be made to the conditions. The reasons for these amendments are summarised below:

122. Condition 4 should be deleted. It is not necessary to restrict the turbine model through conditions. Other conditions relating to noise and height adequately manage effects.

123. Condition 17 should be amended so that potential shadow flicker effects are measured from within the notional boundary, not from within curtilage areas.

124. Conditions 19-22 should be amended to reflect the recommendations set out in evidence of Dr. Chiles.

125. Conditions 23-25 should be amended to focus on bird strike monitoring and reporting, not preparation of an Environmental Management Plan.

RMA PART 2

126. I generally concur with the Part 2 assessment provided in the s.42A Report, although I think the benefits of the proposal have been understated.

127. I have a reasonable good understanding of consenting and developing wind farms in New Zealand and my opinion the application represents a very good example of sustainable management. It:

- Enables the development and operation of a physical resource that will have local, regional and nationally significant benefits while also complementing the production value of the rural land for which the land is zoned under the district plan.
- Is supported by evidence that address all relevant adverse effects on the environment and consent can be granted to ensure that any actual effects on the environment can be avoided, remedied, or mitigated.
- Will not adversely affect any outstanding or significant environmental value afforded protection under s.6 of the Act.
- Is largely supported by and represents a resilient community, including manawhenua.
- Will generally maintain amenity values. Amenity values of some individuals, will be affected and that those effects are considered by some of these neighbours to be significant and adverse. However, in my opinion these adverse effects are countered and outweighed by the people in the community who support the proposal coupled with the national significance of providing for small and community scale renewable electricity generation activities.

CONCLUSION

128. For the reasons set out in my evidence above I consider overall that, subject to implementation of the consent conditions the proposal represents sustainable management of natural and physical resources. In particular:

- The proposal has benefits that are of local, regional and national significance and, subject to the conditions recommended in my evidence, will generally not have any more than a minor adverse effect on the environment as a whole.
- I recognise the proposal will give rise to adverse effects on neighbouring amenity values and these have been avoided, remedied, or mitigated.
- Residual visual effects are anticipated on some neighbouring residents but I consider overall the benefits and practical constraints associated with the proposal outweigh these adverse effects.
- While the wind farm is classified as a non-complying activity under the ODP it is not contrary to the plans objectives and policies. In this case the non-complying activity status is driven by the failure of the ODP to provide for renewable electricity generation activities in the district and in this case I consider substantial weight can be given to the intent of the objectives and policies of the PDP, which more accurately reflects the regional and local government policy direction for renewable electricity generation activities as required by the NPSREG.

129. I support extending the lapsing period to 10 years. In my opinion this is an appropriate recognition of the practical constraints associated with development a wind farm, particularly one that is being developed by a community organisation.

APPENDIX BF 1

LIST OF RELEVANT OBJECTIVES & POLICES

National Policy Statement for Renewable Electricity Generation 2011

Objective

To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation.

POLICY A

Decision-makers shall recognise and provide for the national significance of renewable electricity generation activities, including the national, regional and local benefits relevant to renewable electricity generation activities. These benefits include, but are not limited to:

a) maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions;

b) maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation;

c) using renewable natural resources rather than finite resources;

d) the reversibility of the adverse effects on the environment of some renewable electricity generation technologies;

e) avoiding reliance on imported fuels for the purposes of generating electricity.

POLICY B

Decision-makers shall have particular regard to the following matters:

a) maintenance of the generation output of existing renewable electricity generation activities can require protection of the assets, operational capacity and continued availability of the renewable energy resource; and

b) even minor reductions in the generation output of existing renewable electricity generation activities can cumulatively have significant adverse effects on national, regional and local renewable electricity generation output; and

c) meeting or exceeding the New Zealand Government's national target for the generation of electricity from renewable resources will require the significant development of renewable electricity generation activities.

POLICY C1

Decision-makers shall have particular regard to the following matters:

a) the need to locate the renewable electricity generation activity where the renewable energy resource is available;

b) logistical or technical practicalities associated with developing, upgrading, operating or maintaining the renewable electricity generation activity;

c) the location of existing structures and infrastructure including, but not limited to, roads, navigation and telecommunication structures and facilities, the distribution network and the national grid in relation to the renewable electricity generation activity, and the need to connect renewable electricity generation activity to the national grid;

d) designing measures which allow operational requirements to complement and provide for mitigation opportunities; and

e) adaptive management measures.

POLICY C2

When considering any residual environmental effects of renewable electricity generation activities that cannot be avoided, remedied or mitigated, decision-makers shall have regard to offsetting measures or environmental compensation including measures or compensation which benefit the local environment and community affected.

Regional Policy Statement 1998

Objective 4.4.5 Kaitiakitanga (Guardianship)
To incorporate the concept and spirit of kaitiakitanga in the management of Otago's natural and physical resources in a way consistent with the values of Kai Tahu.

Objective 5.4.1
To promote the sustainable management of Otago's land resources in order:
(a) To maintain and enhance the primary productive capacity and life-supporting capacity of land resources; and (b) To meet the present and reasonably foreseeable needs of Otago's people and communities.

Objective 5.4.2
To avoid, remedy or mitigate degradation of Otago's natural and physical resources resulting from activities utilising the land resource.

Objective 5.4.3
To protect Otago's outstanding natural features and landscapes from inappropriate subdivision, use and development.

Policy 5.5.3 To maintain and enhance Otago's land resource through avoiding, remedying or mitigating the adverse effects of activities which have the potential to, among other adverse effects: (a) Reduce the soil's life-supporting capacity (b) Reduce healthy vegetative cover
(c) Cause soil loss (d) Contaminate soils (e) Reduce soil productivity (f) Compact soils (g) Reduce soil moisture holding capacity.

Policy 5.5.6 To recognise and provide for the protection of Otago's outstanding natural features and landscapes which:
(a) Are unique to or characteristic of the region; or
(b) Are representative of a particular landform or land cover occurring in the Otago region or of the collective characteristics which give Otago its particular character; or
(c) Represent areas of cultural or historic significance in Otago; or
(d) Contain visually or scientifically significant geological features; or
(e) Have characteristics of cultural, historical and spiritual value that are regionally significant for Tangata Whenua and have been identified in accordance with Tikanga Maori.

Objective 12.4.1 To avoid, remedy or mitigate the adverse effects on Otago's communities and environment resulting from the production and use of energy.

Objective 12.4.2 To sustainably and efficiently produce and use energy taking into account community values and expectations.

Objective 12.4.3 To encourage use of renewable resources to produce energy.

Policy 12.5.2 To promote the sustainable management and use of energy through:
(a) Encouraging energy production facilities that draw on the region's renewable energy resources; and (b) Encouraging the use of renewable energy resources, in a way that safeguards the life-supporting capacity of air, water, soil and ecosystems and avoids, remedies and mitigates adverse effects on the environment, as a replacement for non-renewable energy resources: and (c) Encouraging the sustainable development of Otago's renewable energy resources.

Policy 12.5.3 To promote improved energy efficiency within
Otago through: (a) Encouraging the use of energy efficient technology and architecture; and
(b) Educating the public about energy efficiency; and (c) Encouraging energy efficiency in all industry sectors; and (d) Encouraging energy efficient transport modes in Otago.

Policy 12.5.4 To promote the securing of appropriate benefits for Otago's communities from any energy developments within the region.

Proposed Regional Policy Statement 2015

Objective 1.1
The principles of Te Tiriti o Waitangi are taken into account in resource management decisions.

Policy 1.1.1
Promote awareness and understanding of local authorities' obligations regarding the principles of Te Tiriti o Waitangi, tikaka Māori and kaupapa Māori.

Policy 1.1.2 Taking the principles of Te Tiriti o Waitangi into account
Ensure that local authorities exercise their functions and powers, to:
a) Accord Kāi Tahu a status distinct from that of interest groups and members of the public, consistent with their position as a Treaty partner; and, b) Involve Kāi Tahu in resource management decision-making processes and implementation; and c) Take into account Kāi Tahu views in resource management decision-making processes and implementation, particularly regarding the relationship of their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taoka; and d) Ensure Kāi Tahu have the prerogative to: i. Identify their relationship with their ancestral lands, water, sites, wāhi tapu, and other taoka; and ii. Determine how best to express that relationship; and e) Ensure Kāi Tahu are able to exercise kaitiakitaka; and f) Ensure that district and regional plans: i. Give effect to the Ngāi Tahu Claims Settlement Act 1998; and ii. Recognise and provide for statutory acknowledgement areas, as detailed in Schedule 2; and iii. Provide for other areas in Otago that are recognised as significant to Kāi Tahu in a manner similar to that prescribed for statutory acknowledgement areas.

Policy 1.2.1 Managing the natural environment to support Kāi Tahu wellbeing
Manage the natural environment to support Kāi Tahu wellbeing by: a) Ensuring resources support their customary uses and cultural values (as detailed in
Schedules 1A and B); and b) Safe-guarding the life-supporting capacity of natural resources

Objective 2.1
The values of Otago's natural and physical resources are recognised, maintained and enhanced

Policy 2.1.5 Managing for soil values
Recognise soil values, and manage soils, to: a) Maintain their life supporting capacity; and
b) Maintain soil biodiversity; and c) Maintain biological activity in soils; and d) Maintain soil's function in the storage and cycling of water, nutrients, and other elements through the biosphere; and e) Maintain soil's function as a buffer or filter for pollutants resulting from human activities, including aquifers at risk of leachate contamination; and f) Retain soil resources for primary production; and g) Protect Kāi Tahu values; and h) Provide for other cultural values; and i) Maintain the soil mantle where it acts as a repository of heritage objects; and j) Maintain highly valued soil resources; and k) Avoid contamination of soil; and
l) Avoid the adverse effects of pest species, prevent their introduction and reduce their spread

Policy 2.1.7 Recognising the values of natural features, landscapes, and seascapes
Recognise the values of natural features, landscapes, seascapes and the coastal environment are derived from the following attributes, as detailed in Schedule 4: a) Biophysical attributes, including: i. Natural science factors; ii. The presence of water; iii. Vegetation (indigenous and introduced); iv. The natural darkness of the night sky; b) Sensory attributes, including: i. Legibility or expressiveness; ii. Aesthetic values; iii. Transient values, including nature's sounds; iv. Wild or scenic values; c) Associative attributes, including: i. Whether the values are shared and recognised; ii. Cultural and spiritual values for Kāi Tahu; iii. Historical and heritage associations.

Policy 2.2.7 Identifying the landward extent of the coastal environment
Identify the landward extent of the coastal environment, using the following criteria: a) Area or landform dominated by coastal vegetation or habitat of indigenous coastal species; and b) Landforms and the margins of landforms where active coastal processes, influences or qualities are significant; and c) Any landscapes or features, including coastal escarpments, which contribute to the natural character, visual quality or amenity values of the coast; and d) Any physical resource or built form, including infrastructure, that has modified the coastal environment and retains a connection to or derives character from connection to the coast; and e) The relationship of takata whenua with the coastal environment.

Policy 2.3.1 Applying an integrated management approach among resources
Apply an integrated approach to the management of Otago's natural and physical resources, to achieve sustainable management, by: a) Taking into account the impacts of management of one resource on the values of another, or on the environment in general; and b) Recognising that the form and function of a resource may extend beyond the immediate, or directly adjacent, area of interest.

Policy 2.3.2 Applying an integrated management approach within a resource
Apply an integrated management approach within a natural and physical resource, to achieve sustainable management, by: a) Ensuring that resource objectives are complementary across administrative boundaries; and b) Ensuring that effects of activities on the whole of a resource are considered when that resource is managed by sub-units.

Objective 3.1
Protection, use and development of natural and physical resources recognises environmental constraints

Policy 3.1.1
Recognising natural and physical environmental constraints
Recognise the natural and physical environmental constraints of an area, the effects of those constraints on activities, and the effects of those activities on those constraints, including:
a) The availability of natural resources necessary to sustain the activity; and b) The ecosystem services the activity is dependent on; and c) The sensitivity of the natural and physical resources to adverse effects from the proposed activity/land use; and d) Exposure of the activity to natural and technological hazard risks; and e) The functional necessity for the activity to be located where there are significant constraints.

Objective 3.3
Otago's communities are prepared for and able to adapt to the effects of climate change
Policy 3.3.2 Adapting to, or mitigating the effects of, climate change Ensure Otago's people and communities are able to adapt to, or mitigate the effects of climate change, over no less than 100 years, by: a) Taking into account the effects of climate change, including by using the best relevant climate change data; and b) Applying a precautionary approach to assessing the effects of climate change, where there is scientific uncertainty and potentially significant or irreversible effects; and c) Encouraging activities that assist to reduce or mitigate the effects of climate change.

Objective 3.4
Good quality infrastructure and services meet community needs

Policy 3.4.1 Integrating infrastructure with land use
Achieve the strategic integration of infrastructure with land use, by: a) Recognising functional needs of infrastructure of regional or national importance; and b) Designing infrastructure to take into account: i. Actual and reasonably foreseeable land use change; and ii. The current population and projected demographic changes; and iii. Actual and reasonably foreseeable change in supply of, and demand for, infrastructure services; and iv. Natural and physical resource constraints; and v. Effects on the values of natural and physical resources; and vi. Co-dependence with other infrastructural services; and vii. The effects of climate change on the long term viability of that infrastructure;

Policy 3.4.2 Managing infrastructure activities
Manage infrastructure activities, to: a) Maintain or enhance the health and safety of the community; and b) Reduce adverse effects of those activities, including cumulative adverse effects on natural and physical resources; and c) Support economic, social and community activities; and d) Improve efficiency of use of natural resources; and e) Protect infrastructure corridors for infrastructure needs, now and for the future; and f) Increase the ability of communities to respond and adapt to emergencies, and disruptive or natural hazard events; and g) Protect the functioning of lifeline utilities and essential or emergency services.

Objective 3.5
Infrastructure of national and regional significance is managed in a sustainable way

Policy 3.5.1 Recognising national and regional significance of infrastructure
Recognise the national and regional significance of the following infrastructure: a) Renewable electricity generation facilities, where they supply the national electricity grid and local distribution network; and b) Electricity transmission infrastructure; and c) Telecommunication and radio communication facilities; and d) Roads classified as being of national or regional importance; and e) Ports and airports; and f) Structures for transport by rail.

Policy 3.5.2 Managing adverse effects of infrastructure that has national or regional significance
Minimise adverse effects from infrastructure that has national or regional significance, by:
a) Giving preference to avoiding their location in: i. Areas of significant indigenous vegetation and significant habitats of indigenous fauna; and ii. Outstanding natural features, landscapes and seascapes; and iii. Areas of outstanding natural character; and iv. Outstanding water bodies or wetlands; and b) Where it is not possible to avoid locating in the areas listed in a) above, avoiding significant adverse effects on those values that contribute to the significant or outstanding nature of those areas; and c) Avoiding, remedying or mitigating other adverse effects on values; and d) Assessing the significance of adverse effects on those values, as detailed in Schedule 3; and e) Considering the use of offsetting, or other compensatory measures, for residual adverse effects on indigenous biodiversity.

Objective 3.6
Energy supplies to Otago's communities are secure and sustainable
Policy 3.6.2 Promoting small scale renewable electricity generation
Promote small scale renewable electricity generation activities that: a) Increase the local community's resilience and security of energy supply; and b) Avoid, remedy or mitigate adverse effects from that activity.

Objective 4.3
Sufficient land is managed and protected for economic production

Policy 4.3.1 Managing for rural activities
Manage activities in rural areas, to support the region's economy and communities, by: a) Enabling farming and other rural activities that support the rural economy; and b) Minimising the loss of soils highly valued for their versatility for primary production; and c) Restricting the establishment of activities in rural areas that may lead to reverse sensitivity effects; and d) Minimising the subdivision of productive rural land into smaller lots that may result in rural residential activities; and e) Providing for other activities that have a functional need to locate in rural areas, including tourism and recreational activities that are of a nature and scale compatible with rural activities

Dunedin City District Plan 2006

Objective 4.2.1
Enhance the amenity values of Dunedin.

Objective 4.2.3
Sustainably manage infrastructure.

Objective 4.2.4
Ensure that significant natural and physical resources are appropriately protected.

Policy 4.3.1
Maintain and enhance amenity values.

Policy 4.3.4
Provide for the protection of the natural and physical resources of the City commensurate with their local, regional and national significance.

Policy 4.3.6
Provide access to natural and physical resources.

Policy 4.3.9
Require consideration of those uses and developments which: (a) Could give rise to adverse effects. (b) Give rise to effects that cannot be identified or are not sufficiently understood at the time of preparing or changing the District Plan.

Policy 4.3.10
Adopt a holistic approach in assessing the effects of the use and development of natural and physical resources.

Objective 5.2.1
Take into account the principles of the Treaty of Waitangi in the management of the City's natural and physical resources.

Objective 5.2.4
Ensure Manawhenua values are recognised and incorporated into resource management issues that could affect cultural and traditional values.

Policy 5.3.1
Consult with Manawhenua regarding natural and physical resource issues of importance to them.

Policy 5.3.2
Advise Manawhenua of applications for notified resource consents, plan changes and designations.

Objective 6.2.1
Maintain the ability of the land resource to meet the needs of future generations.

Objective 6.2.2
Maintain and enhance the amenity values associated with the character of the rural area.

Objective 6.2.4
Ensure that development in the rural area takes place in a way which provides for the sustainable management of roading and other public infrastructure.

Objective 6.2.5
Avoid or minimise conflict between different land use activities in rural areas.

Objective 6.2.6
Maintain and enhance the life-supporting capacity of land and water resources.

Policy 6.3.1
Provide for activities based on the productive use of rural land.

Policy 6.3.2
Sustain the productive capacity of the Rural Zone by controlling the adverse effects of activities.

Policy 6.3.5
Require rural subdivision and activities to be of a nature, scale, intensity and location consistent with maintaining the character of the rural area and to be undertaken in a manner that avoids, remedies or mitigates adverse effects on rural character. Elements of the rural character of the district include, but are not limited to: (a) a predominance of natural features over human made features, (b) high ratio of open space relative to the built environment, (c) significant areas of vegetation in pasture, crops, forestry and indigenous vegetation, (d) presence of large numbers of farmed animals, (e) noises, smells and effects associated with the use of rural land for a wide range of agricultural, horticultural and forestry purposes, (f) low population densities relative to urban areas, (g) generally unsealed roads,
(h) absence of urban infrastructure.

Policy 6.3.6
Avoid, remedy or mitigate the adverse effects of buildings, structures and vegetation on the amenity of adjoining properties.

Policy 6.3.11
Provide for the establishment of activities that are appropriate in the Rural Zone if their adverse effects can be avoided, remedied or mitigated.

Policy 6.3.12
Avoid or minimise conflict between differing land uses which may adversely affect rural amenity, the ability of rural land to be used for productive purposes, or the viability of productive rural activities.

Objective 20.2.1
Avoid, remedy, or mitigate adverse effects on the environment arising from the establishment, maintenance, improvement and use of the transportation network.

Objective 20.2.2
Ensure that land use activities are undertaken in a manner which avoids, remedies or mitigates adverse effects on the transportation network.

Objective 20.2.4
Maintain and enhance a safe, efficient and effective transportation network.

Policy 20.3.1
Avoid, remedy or mitigate the adverse effects on the environment of establishing, maintaining, improving or using transport infrastructure.

Policy 20.3.2
Provide for the maintenance, improvement and use of public roads.

Policy 20.3.3
Provide for activities on roads and footpaths where this: (a) Is compatible with the function of the road. (b) Is safe for road users and pedestrians. (c) Has no more than minor adverse effects.

Policy 20.3.5
Ensure safe standards for vehicle access.

Policy 20.3.6
Encourage heavy traffic to use appropriate routes.

Policy 20.3.8
Provide for the safe interaction of pedestrians and vehicles.

Policy 20.3.9
To sustainably manage transport infrastructure, particularly that of national or regional importance, in a way which will provide for its effective operation and preserve its capacity to meet the reasonably foreseeable needs of future generations, while avoiding, remedying or mitigating any adverse effects resulting from the operation of this infrastructure.

Objective 21.2.2
Ensure that noise associated with the development of resources and the carrying out of activities does not affect public health and amenity values.

Objective 21.2.3
Ensure that the finishing of structures, the construction of signs and the shielding of light sources avoids, remedies or mitigates nuisance glare.

Policy 21.3.3
Protect people and communities from noise and glare which could impact upon health, safety and amenity.

Objective 22.2.1
Provide for the safe and efficient use and development of utilities within the City.

Objective 22.2.2
Ensure that any adverse environmental effects of the construction, operation and upgrading of utilities in the City are avoided, remedied or mitigated.

Policy 22.3.1
Allow the construction, operation and upgrading of those utilities which have no more than minor adverse effects.

Policy 22.3.2
Require consideration on a case by case basis of the construction, operation and upgrading of utilities with more than minor adverse effects on the environment.

Policy 22.3.4
Encourage location of utilities in corridors.

Policy 22.3.5
Encourage the progressive undergrounding of utilities.

Objective 2.2.2: Energy resilience
Dunedin is well equipped to manage and adapt to any changes that may result from volatile energy markets or diminishing energy sources by having: a. increased local electricity generation;

Policy 2.2.2.3
Enable renewable energy generation through policies and rules that:
a: enable renewable on-site energy generation; and b. enable renewable on-site generation; and support development of small and large scale renewable energy generation in appropriate locations.

Objective 2.3.1: Protection of land important for economic productivity
Land that is important for economic and social prosperity, including industrial areas, major facilities, key transportation routes and productive rural land, is protected from less competing uses or incompatible uses.

Policy 2.3.1.2
Maintain or enhance the productivity of farming and other activities that support the rural economy through: b. rules that provide for rural industry and other activities that support the rural economy;

Objective 2.4.6: Character of rural environment
The character and visual amenity of Dunedin's rural environment is maintained or enhanced.

Policy 2.4.6.2
Maintain the identified values within different rural environments through mapping rural zones and using rules that: a. limit the density of residential activities; b. manage the bulk and location of buildings; c. manage the form and design of development associated with large scale activities such as factory farming; and d. manage the pattern, scale and design of subdivision.

Objective 2.5.1: Kaitiakitaka
Kāi Tahu can exercise kaitiakitaka over resources within their takiwā.

Policy 2.5.1.2
Provide for effective and meaningful engagement with manawhenua at appropriate stages of the resource management process through: a. encouraging early consultation by applicants; b. requiring that the effects on values of significance to manawhenua are considered for culturally sensitive activities and activities that may adversely affect wāhi tūpuna and mahika kai; c recognising and providing for matauraka Māori and tikaka during the consent and hearing processes; and advising rūnaka of applications for activities affecting sites and values of significance.

Objective 5.2.1
Network utilities activities, including renewable energy generation activities, are able to operate efficiently and effectively, while minimising, as far as practicable, any adverse effects on the amenity and character of the zone; and, where located in an overlay zone, scheduled site, or mapped area, meeting the relevant objectives and policies for those areas.

Policy 5.2.1.1
Encourage the use and development of renewable energy generation.

Policy 5.2.1.2

Require development to be designed and located to avoid adverse effects on the safe and efficient operation of national grid infrastructure or, where avoidance is not possible, ensure any adverse effects would be insignificant.

Policy 5.2.1.5
Require network utilities structures to be of a scale, size, design and location that enables the provision of network utilities while: a. minimising, as far as practicable, adverse effects on the amenity and character of the zone; b. maintaining a high level of pedestrian amenity in pedestrian street frontages.

Policy 5.2.1.7
Require network utilities structures are located, designed, and operated to ensure any risk to health and safety is no more than minor.

Policy 5.2.1.9
Require earthworks to be set back from network utilities an adequate distance to avoid: a. damage to existing network utilities; b. obstruction of access to existing underground network utilities; and c. adverse effects on the health and safety of people.

Policy 5.2.1.11
Only allow network utility structures - large scale, regional scale energy generation in the rural zones, network utilities poles and masts-small scale (other than in the rural, rural residential or industrial zones), community scale energy generation, biomass generators - stand-alone, and biomass energy generation on-site energy generation and energy resource investigation devices (other than in the rural and industrial zones) where the activity is designed and located to avoid any significant adverse effects and minimise adverse effects, as far as practicable, including: a. effects on visual amenity and the character of the zone in which the activity is located; and b. effects on the amenity of any surrounding residential activities.

Objective 6.2.1
Transport infrastructure is designed and located to ensure the safety and efficiency of the transport network for all travel methods while: a. minimising, as far as practicable, any adverse effects on the amenity and character of the zone; and b. meeting the relevant objectives and policies for any overlay zone, scheduled site, or mapped area in which it is located.

Policy 6.2.1.3
Only allow new roads or additions or alterations to existing roads where:
a. the road is designed to provide for the needs of all users, as appropriate for the surrounding environment and road classification hierarchy mapped area b. the location and design of the road: i. minimises adverse effects on surrounding residential or other sensitive activities, including severance effects, changes to drainage patterns, and vibration, noise, glare and fumes from vehicle movements; ii. maintains or enhances the safety and efficiency of the overall transport network; and iii. minimises adverse effects on water bodies or the coast, areas of indigenous vegetation or other areas important for biodiversity, or identified landscape or natural character of the coast values.

Objective 6.2.3
Land use, development and subdivision activities maintain the safety and efficiency of the transport network for all travel methods.

Policy 6.2.3.3
Require land use activities to provide adequate vehicle loading and manoeuvring space to support their operations and to avoid or, if avoidance is not possible, adequately mitigate adverse effects on the safety and efficiency of the transport network.

Objective 6.2.3
Land use, development and subdivision activities maintain the safety and efficiency of the transport network for all travel methods.

Policy 6.2.3.9
Only allow land use, development, or subdivision activities that may lead to land use or development, where there are no significant effects on the safety and efficiency of the transport network.

Objective 6.2.4
Parking areas, loading areas and vehicle accesses are designed and located to: a. provide for the safe and efficient operation of both the parking or loading area and the transport network; b. facilitate the safe and efficient functioning of the transport network and connectivity for all travel methods.

Policy 6.2.4.5
Require new vehicle accesses to be located a sufficient distance from intersections to avoid or, if avoidance is not possible, adequately mitigate adverse effects on safety and efficiency due to: a. vehicles queuing to enter the crossing hindering the efficient functioning of the intersection; and b. confusion over whether indicating vehicles are seeking to turn at the crossing or the intersection creating safety problems.

Policy 6.2.4.6
Require sufficient visibility to be available at vehicle crossings to minimise the likelihood of unsafe vehicle manoeuvres

Objective 14.2.1 The relationship between manawhenua and the natural environment is maintained or enhanced, including the cultural values and traditions associated with:
a. wāhi tūpuna; b. mahika kai; and c. occupation of native reserve land through papakāika

Objective 16.2.1
Rural zones are reserved for productive rural activities and the protection and enhancement of the natural environment, along with certain activities that support the well-being of rural communities where these activities are most appropriately located in a rural rather than an urban environment. Residential activity in rural zones is limited to that which directly supports farming or which is associated with papakāika.

Policy 16.2.1.1 Enable farming, grazing and conservation activity in the rural zones.

Objective 16.2.2 The potential for conflict between activities within the rural zones, and between activities within the rural zones and adjoining residential zones, is minimised through measures that ensure: a. the potential for reverse sensitivity effects from more sensitive land uses (such as residential activities) on other permitted activities in the rural zones is minimised; b. the residential character and amenity of adjoining residential zones is maintained; and c. a reasonable level of amenity for residential activities in the rural zones.

Policy 16.2.2.6 Only allow factory farming, domestic animal boarding and breeding (including dogs), rural industry, mining, landfills or non-rural activities, other than those that are permitted in the rural zones, where the potential for reverse sensitivity effects, that may affect the ability of permitted activities to operate, will be avoided or, if avoidance is not possible, will be no more than minor.

Objective 16.2.3 The rural character values and amenity of the rural zones are maintained or enhanced, elements of which include: a. a predominance of natural features over human made features; b. a high ratio of open space, low levels of artificial light,
and a low density of buildings and structures; c. buildings that are rural in nature, scale and design, such as barns and sheds; d. a low density of residential activity, which is associated with rural activities; e. a high proportion of land containing farmed animals, pasture, crops, and forestry; f. significant areas of indigenous vegetation and habitats for indigenous fauna; and g. other elements as described in the character descriptions of each rural zone located in Appendix A7.

Policy 16.2.3.1 Require buildings, structures and network utilities to be set back from boundaries and identified ridgelines, and of a height that maintains the rural character values and visual amenity of therural zones.

Policy 16.2.3.2 Require residential activity to be at a density that maintains the rural character values and visual amenity of the rural zones.
Policy 16.2.3.9 Require activities to be designed and operated to ensure that adverse effects from light spill on rural character and amenity, and the ability of people to

view the night sky, would be insignificant.

Objective 16.2.5 Earthworks necessary for permitted or approved land use and development are enabled, while avoiding, or adequately mitigating, any adverse effects on: a. visual amenity and character; b. the stability of land, buildings, and structures; and c. surrounding properties.

Policy 16.2.5.1 Require earthworks, and associated retaining structures, to be designed and located to avoid adverse effects on the stability of land, buildings, and structures by: a. being set back an adequate distance from property boundaries, buildings, structures and cliffs; and b. using a batter gradient that will be stable over time.

Policy 16.2.5.2
Require earthworks and any associated retaining structures to be designed and located to minimise adverse effects on surrounding sites and the wider area, including by: a. limiting the scale of earthworks that are provided for as a permitted activity; and b. requiring earthworks to avoid sediment run-off, including onto any property, or into any stormwater pipes, drains, channels or soakage systems.

Policy 16.2.5.3 Only allow earthworks that exceed the scale thresholds (earthworks - large scale) and any associated retaining structures, where all of the following effects will be avoided or, if avoidance is not possible, adequately mitigated: a. adverse effects on visual amenity and character; b. adverse effects on the amenity of surrounding properties, including from changes to drainage patterns; and c. adverse effects on the stability of land, buildings, and structures.

4. Policy A: Benefits of renewables

A. Recognising the benefits of renewable electricity generation activities

Policy A

Decision-makers shall recognise and provide for the national significance of renewable electricity generation activities, including the national, regional and local benefits relevant to renewable electricity generation activities. These benefits include, but are not limited to:

a) maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions;

b) maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation;

c) using renewable natural resources rather than finite resources;

d) the reversibility of the adverse effects on the environment of some renewable electricity generation technologies;

e) avoiding reliance on imported fuels for the purposes of generating electricity.

Policy A requires a broad understanding of the nature, extent and location of relevant developed and undeveloped renewable resources and the associated national, regional and local benefits. Information on the current renewable energy potential can be derived from sources such as EECA's regional renewable energy assessments, and the NIWA EnergyScape™ maps and from consultation with electricity generators.

The benefits of renewable electricity generation activities can occur on a local, regional and national scale. The following section provides information on the benefits list in Policy A. It also describes other general benefits of electricity generation along with benefits specific to each renewable electricity technology noting this is not an exhaustive list.

Policy A

a) Maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions

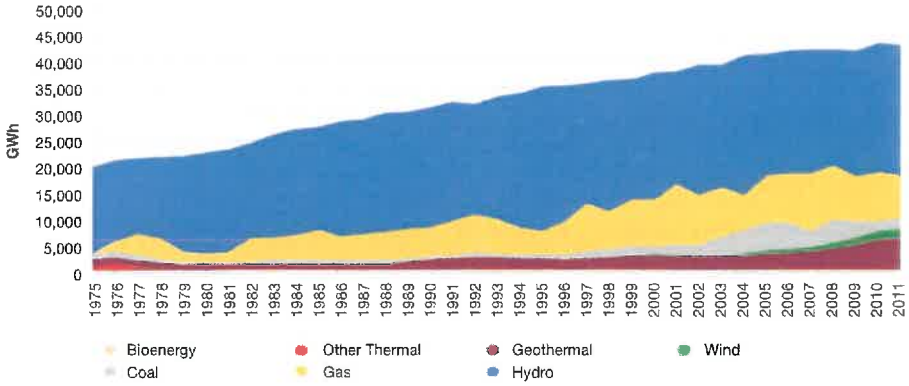
One of the principal contributors to climate change is greenhouse gas emissions generated from human activities, such as the burning of fossil fuels for electricity generation. Renewable electricity generation contributes towards meeting electricity demand without emitting greenhouse gases (other than the small amount emitted during construction or during the production of electricity from geothermal resources – referred to as fugitive emissions which occur when CO_2 comes to the surface with the geothermal fluids and is released). Emissions from geothermal vary from field to field but its CO_2e emissions are currently lower on average than fossil fuel generation.

Internationally, New Zealand has a significant advantage as its electricity has one of the highest renewable proportions globally, and has potential for significantly greater utilisation of renewable electricity. Renewable electricity generation provides a cost effective option for avoiding increased greenhouse gas emissions in the future.

This is important given national and international aspirations to address greenhouse gas emissions. New Zealand's national climate change target is for a 50% reduction in greenhouse gas emissions from 1990 levels by 2050.

In 2010, New Zealand's total greenhouse gas emissions had increased by 19.8% above 1990 levels with CO_2 emissions increasing 32.7%.[25] More gas-fired electricity generation, and increased use of coal at Huntly power station (which can run on either gas or coal), contributed to this. Figure 18 shows the changes in electricity generation by fuel type in New Zealand.[26]

Figure 18 Electricity generation in New Zealand by fuel type



(Source: Energy Data File 2012)

Policy A

b) Maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation

Security of supply

Security of electricity supply has several elements to it and is fundamentally the ability of the electricity system to meet the demands of electricity consumers, meeting both current demand (as it varies throughout the day and the year), and meeting growing future demand. Security of supply requires sufficient generation capacity and fuel to meet demand. The nature of electricity means that, once generated, it cannot be stored within the power system for any material time. Electricity must therefore be generated on demand and coordinated on a moment-to-moment basis to maintain supply to consumers.

Renewable electricity generation can improve the security of New Zealand's electricity supply by achieving the following:[27]

- increased generation capacity (i.e. maintaining sufficient levels of generation capacity and fuel to meet existing and future demand)
- diversified type and location of electricity supply (i.e. having a variety of generation capacity and type that contributes to a robust and resilient electricity system)
- long-term availability of a renewable energy supply in comparison with fossil fuel supply which is finite.

Meeting demand

A secure and reliable electricity supply is essential for New Zealand's economy, and our well-being. Over the long term, New Zealand's electricity demand is forecast to continue to grow and new generation will need to be built in order to meet growing demand for electricity and replace retired generation assets.

25 Ministry for the Environment (2012) *New Zealand's Greenhouse Gas Inventory 1990–2010*, p28, 31.
26 Ministry of Economic Development (2012) *New Zealand Energy Data File 2011 Calendar Year*, p103.
27 Note that these potential benefits are not exclusive to renewables and may also apply to fossil fuel generation.

Diversification

Diversity is another important element of maintaining and improving security of electricity supply. The electricity system will be more resilient to sudden and unexpected changes, such as fuel price shocks or natural disasters, if electricity is obtained from a diverse range of generation sources. Hydro-electricity provides approximately 60% of New Zealand's electricity. While this brings with it great benefits, it also means that the system is very dependent on rainfall to provide inflows into the hydro storage systems for winter's higher electricity demand.

Diversity of electricity sources – for instance, providing generation from wind and geothermal energy as well as hydro-electricity – contributes to system resilience by providing alternative generation to hydro particularly in dry years. Each resource type has different characteristics. Wind generation is very reliable month to month and year to year, complementing more variable hydro renewable energy sources. Geothermal generation operates at higher load factors compared to hydro and wind generation and uses a constant fuel source day-to-day and year-to-year meaning it provides a reliable and constant amount of electricity generation (often referred to as 'baseload generation'). Hydro storage-based generation provides flexible electricity generation. Although not yet widely used, solar can provide excellent supply in urban areas, as sunshine hours coincide with the demand from office and air conditioning loads.

Geographic diversity of the electricity system as a whole is also important and adds to the system's resilience. For example, wind generation spread throughout the country reduces the effect of short-term wind variability in any one location.

Policy A

c) Using renewable natural resources rather than finite resources

The utilisation of renewable resources such as hydro, wind, tidal, solar, geothermal and biomass does not deplete finite resources. This means that it could be used sustainably for current and future generations. To ensure that geothermal and biomass remain long-term sources of renewable energy, careful management is required.[28]

Conversely, fossil fuels which are used in thermal generation are finite resources. Although thermal generation typically has a relatively lower 'upfront' capital expenditure, it has higher ongoing fuel costs, and the costs of carbon if applicable.[29]

Policy A

d) The reversibility of the adverse effects on the environment of some renewable electricity generation technologies

Reversibility has been defined as whether an adverse effect can be reversed at the end point of a project to a state where offsite adverse effects are no more than minor.[30] Research shows that adverse environmental effects from hydro-electricity, geothermal[31] and wind technologies are all largely reversible. For example, a wind farm can be decommissioned in its entirety with all turbines and other above ground structures being removed and turbine footing covered and re-vegetated.

Reversibility is based on the restoration timeframe, costs of removal and restoration and the level of treatment required. However, there is differing ease in reversing the adverse effects across the different renewable types. For example, adverse effects from wind farms are the most easily reversed, followed by geothermal, then from hydro which takes the longest and is the most expensive to restore.[32] In some cases the cost may outweigh the benefits of restoration.

28 In the case of geothermal energy there can be controlled depletion of a local resource, but this can be restored over time because of the effectively infinite source of heat below the affected area, assisted by flow of fluid back into the reservoir and deep convection.

29 Concept Consulting Group (2009). *Renewable Generation and Security of Supply*. Prepared for the Energy Efficiency and Conservation Authority

30 Oldham, K (2008). *Reversibility of Renewable Energy Developments*.

31 Some aspects of geothermal development are not fully reversible. Subsidence is not reversible, but the permanent lowering of land is generally of minor impact, unless there is a risk of flooding or there are buildings/infrastructure located at the edge of a significant subsidence bowl. Where surface discharges are depleted or cease, while total discharge will be restored, it is not certain that the original features will recover and new geothermal features may develop. Any ecosystem rendered extinct by the cessation of flow will be replaced by new ecosystems, possibly with reduced biodiversity and resilience.

32 Ibid, 30.

Policy A

e) Avoiding reliance on imported fuels for the purposes of generating electricity

Renewable energy projects utilise a local renewable energy resource, potentially reducing the use of imported fossil fuels for the purposes of generating electricity. (This depends whether gas, coal or other renewables are the likely alternative.) Once constructed, the cost of electricity produced from renewable electricity generation is not affected by international or local fuel prices and so can provide a natural hedge, or insurance, against rising and volatile carbon prices and fossil fuel prices. Fossil fuel generation by comparison has lower 'upfront' capital costs and higher ongoing fuel costs when compared with renewable alternatives. Fossil fuel generation is therefore exposed to changes in the price of fossil fuel over time.

Fossil fuel electricity generation in New Zealand in 2013 relies on both domestic and imported coal, in which case coal prices in New Zealand are to some extent linked to the international market and are subject to global supply and demand. There is currently no import or export of natural gas in New Zealand: the price of gas is primarily determined by domestic supply and demand. While some renewable generation is currently cheaper than gas-fuelled generation, this may change in future if new large gas fields which depress the domestic gas price are developed. However, if a gas export capability (e.g. LNG terminal) is built in New Zealand, it is unlikely gas will be used for electricity generation domestically[33] because the gas will be higher value as an export, and New Zealand has cheaper renewable electricity generation options.

By contrast, these price risks are not generally encountered with renewable technologies as the fuel source is not subject to commodity price volatility. Also, the effective price of all fossil fuels will be influenced by national and international carbon prices because of the need to take account of associated greenhouse gas emissions. New Zealand faces a cost for such emissions and this cost is difficult to predict over time. Production of electricity from renewable resources creates few emissions, reducing New Zealand's net exposure to costs associated with carbon liabilities.

Other benefits

There is a range of other benefits of renewable electricity generation facilities, including:

- development of specialist green skills and experience that can be exported overseas, such as New Zealand's geothermal skills that are in demand for new geothermal projects around the world
- it is also benign in terms of air quality, with no emission of contaminants into the air, except in the case of geothermal and biomass where there are some emissions
- in general, there is a reduction in transmission and distribution line losses if the facility is closer to a demand load and / or embedded in a local distribution network.

Benefits specific to electricity generation using hydro resources (with storage)

- Hydro-electricity with storage has the advantage that it is more controllable and can be correlated with demand. Figure 19 show's Lake Pukaki which has the greatest active hydro storage in New Zealand

Figure 19 Lake Pukaki (Waitaki River hydro-electricity scheme)

(Photo courtesy of Meridian Energy)

33 This would depend on domestic gas fields having access to the Liquefied Natural Gas export terminal.

- Hydro storage can be controlled, and is therefore very valuable in an electricity system where demand, and some generation sources (e.g. run-of-river hydro and wind), are varying hour to hour. This means that hydro-electricity is particularly important in maintaining security of supply as it is able to adapt to and complement changing generation and demand patterns and allow New Zealand to maximise its renewable resources at least cost. In the future, with an increasing share of generation being met by wind, this feature will become even more important
- Hydro-electricity provides both instantaneous reserves and frequency keeping
- The creation of lakes contributes to tourism and provides recreational opportunities (e.g. boating and swimming). New Zealand's two main rowing race courses are based on lakes created for hydro-electricity generation
- Hydro scheme infrastructure can provide opportunities for irrigation schemes to access secure supplies of water that would not be economically viable if the hydro-electricity generation facility did not exist and to reduce the costs of operating and maintaining headworks infrastructure through shared use of resources and expertise.

Benefits specific to electricity generation using geothermal resources

- It provides a good source of non weather-dependent reliable baseload renewable electricity generation (i.e. a consistent source of electricity)
- The continuous nature of the fuel source as constant steam fluid from geothermal reservoirs provides very high power station capacity factors well above 90%. Once a geothermal electricity station is generating it will operate continuously except for planned maintenance cycles and forced outages
- New Zealand's main geothermal resources are located in the North Island in close proximity to the largest electricity demand centres and therefore result in reduced transmission losses in the electricity system, contributing to the efficient end use of electricity
- Generally, the power stations have a small footprint and low height (excluding vapour plumes) and therefore a low visual impact (although associated steam fields can cover several square kilometres). Figure 20 shows the cooling tours at the Ngāwhā geothermal power station in Northland.

Figure 20 Ngāwhā geothermal power station, Northland

(Photo courtesy of Top Energy)

- Geothermal generation currently represents the lowest cost generation options available in New Zealand from all fuel types including fossil fuel options
- It is possible to use steam condensate for irrigation purposes
- Developments frequently are based on partnerships with Māori so there are flow-on benefits to this sector of society
- Developments draw on the world-leading expertise of New Zealand geothermal consultants and hones their skills for the international market
- There may be opportunities to use surplus heat for primary production and industrial direct heat uses and/or other cascading uses
- Developments are to some degree compatible with other land uses such as farming and forestry (though generally not with direct geothermal tourism as geothermal generation can reduce activity of geothermal surface features; indirect tourism may arise from the generation site itself).

Benefits specific to electricity generation using wind resources

- Electricity generated from wind resources utilises an abundant resource which is yet to be fully utilised
- New wind generation, together with geothermal, will contribute to a more balanced portfolio of renewable generation technologies, reducing the electricity sector's exposure to dry year risk. This is because wind generation is very reliable over the longer term (month to month and year to year); it is much less variable than hydro inflows. In the short term, hydro-electricity generation with storage can be used to provide generation flexibly to respond quickly to wind energy variability without incurring large operating costs
- Wind generation can be usefully forecast. While wind is variable over the short term, it is predictable and less variable than hydro. This makes managing wind variability in the short term easier, as increases and decreases in wind generation can be forecast hours and days ahead with useful accuracy. Short-term wind variability can also be reduced by developing geographically diverse wind farms. Having wind farms in different wind regions means that while one may not be generating, another might be, thus having a smoothing effect on overall national generation from wind
- Wind farm developments can co-exist with other land uses such as agricultural activities creating sustainable, mixed land use. (See Figure 21 showing Project West Wind.)
- Turbines can attract tourism and provide recreational opportunities such as mountain bike tracks or hiking within wind farm locations
- Maintenance of wind farms can be carried out with minimal disruption to electricity generation (unlike some other types of power stations) as a single turbine can be repaired without requiring a whole wind farm to cease generation.

Figure 21 Project West Wind, Wellington

(Photo courtesy of Meridian Energy)

Benefits specific to electricity generation using biomass resources

- Biomass resources are predictable and manageable – the volume of the available resource can be predicted in advance and managed to meet energy demands
- Biomass can be stored and transported (though at a cost) and used where and when required. Figure 22 shows a large scale biomass storage facility

Figure 22 Biomass feedstock storage

(Source: EECA)

- Biomass can be used efficiently by producing heat and electricity through combined heat and power plants
- Biomass can be converted to biogas for electricity generation.

Benefits specific to electricity generation using solar resources

- Solar energy is an abundantly available and evenly distributed resource and as such can be applied at almost any location in the country
- Solar electricity can (with increased uptake) contribute to a more balanced portfolio of renewable generation technologies, reducing the electricity sector's exposure to dry year[34]
- Solar electricity generation systems can be installed close to (or on) the point of use, reducing transmission losses and contributing to the efficient end use of electricity. Figure 23 shows PV panels mounted on the roof a remote hut

Figure 23 Roof-mounted PV array

(Crown copyright: Department of Conservation: Te Papa Atawhai 2009)

- There are no noise impacts of solar electricity generation
- Solar electricity generation does not usually require new land, as it can be installed on existing infrastructure
- Solar is a highly reliable technology at any scale
- There are low environmental impacts during construction and operation of solar electricity systems
- Solar generation can be easily added incrementally to match capacity increase needs – maximising the utilisation of investments.

34 Currently in New Zealand solar is used mainly in residential domestic scale applications and a few individual industrial applications. It is not yet used for commercial-scale electricity generation.

Benefits specific to electricity generation using marine resources

- Marine energy devices, particularly submarine tidal current turbines, are likely to have limited visual or noise impacts on humans
- Off-shore wave energy devices and tidal current devices may be compatible with some other activities such as marine reserves and marine farms (though they may compete with commercial or recreational fishing)
- Tidal energy is variable, but it is somewhat predictable – tidal heights are very predictable, but tidal currents are much less so due to interaction of ocean currents, wind effects and other factors. Cook Strait tidal currents are notably variable from theoretical predictions.

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Benefits of wind farms

Wind farms create a range of economic, social and environmental benefits at global, national and local levels. This fact sheet highlights some of those benefits.

A series of case studies about some of the benefits of wind farms are available at: http://windenergy.org.nz/resources/resources/case-studies. These case studies discuss the benefits of wind farms in terms of Business and Community Opportunities, Improving Electricity Supply, Farming the Wind; and Local Economic Benefits.

Global benefit

Modern societies rely on access to electricity. Wind energy is recognised globally as one of the most sustainable forms of electricity generation. This is largely because the use of wind energy, a renewable natural resource, slows the consumption of finite and exclusive fuels, which preserves the natural environment and thus provides for future generations.

National benefits

Increasing New Zealand's electricity supply from wind energy will put New Zealand on a better path towards sustainable development.

- Wind farms generate electricity using an infinite and abundant renewable energy resource and therefore wind farms help reduce reliance on finite fossil fuels.
- Electricity generated from the wind creates no more greenhouse gas emissions than hydro-electricity, and much less than all other forms of electricity generation available in New Zealand, including geothermal and solar.
- As a clean, safe and green form of electricity generation, wind energy helps promote New Zealand's 100% Pure brand.
- Wind energy is New Zealand's preferred form of new electricity generation. Studies commissioned by the New Zealand Energy Efficiency and Conversation Authority (EECA) consistently demonstrate that New Zealanders prefer wind energy over other types of new electricity generation.
- Wind farm development throughout New Zealand provides national economic development benefits through industry and business growth opportunities.
- Wind farms are long-term infrastructure that utilise a free and reliable fuel supply. This helps make wind energy a low risk form of electricity generation that can readily contribute to New Zealand's wider electricity generation system.

New Zealand's National Policy Statement for Renewable Electricity Generation identifies that renewable electricity generation activities have national, regional and local benefits including but not limited to:

a) maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions;

b) maintaining or increasing security of electricity supply at local, regional and national levels by diversifying the type and/or location of electricity generation;

c) using renewable natural resources rather than finite resources;

d) the reversibility of the adverse effects on the environment of some renewable electricity generation technologies;

e) avoiding reliance on imported fuels for the purposes of generating electricity.

National benefits continued...

- Wind farms can be small or large. This means they can be located and designed to suit a wide variety of needs, from a small amount of generation feeding into a rural network to a large wind farm powering a city.
- Wind energy is a competitive price taker in the electricity market. It helps reduce the spot price of electricity.
- The environmental effects of wind farms are the most reversible of any form of utility-scale electricity generation in New Zealand. Wind farm infrastructure can be decommissioned and taken off site leaving only the physical footprint of land modification resulting from internal roads and foundations.
- Wind farms can secure the value of the existing land, which in turn can protect natural values for future generations by preventing intensive land development. In some cases wind farms can help improve New Zealand's overall biodiversity values through supporting ecological restoration.
- Wind farms contribute to New Zealand's national and international obligations for reducing greenhouse gas emissions and addressing climate change.

Local benefits

- Most wind farms are built on rural land. Wind farms provide landowners with a new income stream that can improve the return from their land and allow valued agricultural business to continue.
- Wind farm construction creates significant local economic benefits through local spend, opportunities for business development including tourism, community projects and research. Wind farm construction is often the largest capital works project in rural areas.
- Wind farms can be scaled to fit demand, resource availability and site constraints. Therefore wind farms can potentially operate in each region of New Zealand.
- Wind farms can increase the stability of the local electricity network and increase security of supply at a local level thus contributing to a region's self-sufficiency.
- Wind farms can enhance recreation values. In some cases wind farm development can provide opportunities for improving public access to previously inaccessible areas of high recreational value.
- Wind farms can enhance heritage values. In some cases wind farm development can provide opportunities for improving a range of heritage engagement enhancement opportunities, for example, improving public access to selected historic sites and areas.
- Wind farms can enhance the local road network. Developers will often upgrade local roads to enable large wind turbine components to be transported to site.
- Wind farms can enhance local biodiversity values. In some cases wind farm developers can contribute to the restoration or improvement of local biodiversity values, including protecting indigenous biodiversity on farm land.
- Wind farms can enhance amenity values. Many people like the look of wind farms, although in every case there is a degree of subjective judgement involved. In New Zealand, communities have used wind turbines to promote their wellbeing and 'sense of place'.

Gebbies Pass

More Information

Find out more about wind energy and wind farms in New Zealand at www.windenergy.org.nz.

NZ Wind Energy Association

PO Box 553, Wellington 6140,
New Zealand

The New Zealand Wind Energy Association (NZWEA) is an industry association that works towards the development of wind as a reliable, sustainable, clean and commercially viable energy source. We aim to fairly represent wind energy to the public, government and the energy sector. Our members include 80 companies involved in New Zealand's wind energy sector, including electricity generators, wind farm developers, lines companies, turbine manufacturers, consulting firms, researchers and law firms.

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JUNE 2013

CIVIL AVIATION AUTHORITY OF NEW ZEALAND

S-A765-04 16/77/0023(DW1325162-0)

01 February 2016

Mr Scott Willis
Blueskin Energy Ltd
1121 Mt Cargill Road
RD 2 Waitati
Dunedin 9085

Dear Mr Willis

Determination: Porteous Hill Dunedin Three Enercon Wind Turbines

Following receipt of the Notice of Proposal from Blueskin Energy Ltd to erect and operate a three turbine wind farm in the vicinity of Porteous Hill, Southland, the Director of Civil Aviation has conducted an aeronautical study to determine whether the specific proposal, if executed, will constitute a hazard in navigable airspace.

The aeronautical study has now been completed, and a **Determination of Hazard in Navigable Airspace** has been made.

I enclose the Determination with this letter.

Please note any specific conditions and any expiry dates on this Determination.

Yours faithfully

Dianne Parker (Mrs)
Group Executive Officer
Aviation Infrastructure and Personnel

NAVIGABLE AIRSPACE DETERMINATION: Blueskin Energy Ltd Porteous Hill Dunedin – Wind Farm

PURSUANT TO Rule Part 77 of the Civil Aviation Rules I, Sean Turangarau Kere Rogers, Manager Aeronautical Services, having received from Blueskin Energy Ltd, notification of intention to erect and operate a three turbine wind farm in the vicinity of Porteous Hill, Southland, conducted an aeronautical study in consultation with such persons, representatives and organisations as I considered appropriate.

After completing the aeronautical study, I am satisfied that the proposed action, if executed, could constitute a hazard in navigable airspace.

THEREFORE I HEREBY ISSUE a

DETERMINATION OF HAZARD IN NAVIGABLE AIRSPACE

in respect of the above notification.

The following conditions are specific to this Determination:

1. The wind turbines must be painted white; and
2. Each wind turbine must be lit with a medium intensity red light (minimum 1600 candela) located at the top of the mast and visible in all directions from the mast (in accordance with Civil Aviation Rule Part 77, Appendix B). The light may be shielded below the horizontal plane; and
3. The wind farm must be depicted on aeronautical charts. Precise surveyed information of the location of each turbine, elevation of the ground at the site of each turbine, maximum height of each turbine (including the turbine blade) above ground level and a commencement date of construction and of operation is to be provided to the CAA and GroupEAD Asia Pacific.

The provisions of this determination are in addition to and not in derogation of the provisions of any other Act, or any orders or regulations made thereunder.

This Determination of Hazard shall become final on the 20th day of February 2016 unless a petition for review is received by the Director prior to that date.

This Determination of Hazard shall not expire but may be revoked, in writing, by the Director.

Dated at Wellington this 22nd day of January 2016.

Sean Turangaraw Kere Rogers,
Manager Aeronautical Services
(DW1324748-0)

The provisions of this determination are in addition to and not in derogation of the provisions of any other Act, or any orders or regulations made thereunder.

APPENDIX BF5

Ben.Farrell

Subject: Radar Blackspots

From: Campbell Hodgson [mailto:Campbell.Hodgson@gallawaycookallan.co.nz]
Sent: Wednesday, 27 April 2016 2:49 p.m.
To: 'Kebbell, Lucy'
Cc: Bridget Irving; Falconer, Alistair; Perris, Greg
Subject: RE: Radar Blackspots

Hi Lucy,

Thank you for Airways' help in this matter.

Kind regards,

Campbell

From: Kebbell, Lucy [mailto:Lucy.Kebbell@airways.co.nz]
Sent: Wednesday, 27 April 2016 2:46 p.m.
To: Campbell Hodgson
Cc: Bridget Irving; Falconer, Alistair; Perris, Greg
Subject: RE: Radar Blackspots

Hi Campbell,

I am pleased to confirm that, due to the location of the proposed turbines, there is no issue with your proposal causing blackspots in respect of radar, radio or any air navigation facility as far as Airways is concerned and a formal aeronautical assessment is not required.

We note that the structures may constitute a hazard in navigable airspace and we refer you to Civil Aviation Rule Part 77 in this regard: https://www.caa.govt.nz/rules/Rule_Consolidations/Part_077_Consolidation.pdf

Kind regards,

Lucy Kebbell
04 471 4791

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Practical constraints associated with developing a wind farm

The merits of any wind farm site, design, and overall feasibility will be driven by the developer's own assessment of various commercial, technical, and environmental considerations. For each of these considerations a number of practical constraints will apply regardless of the location or scale of the project.

Practical constraints associated with developing and operating a wind farm have been summarised by the New Zealand Energy Efficiency and Conservation Authority (EECA) in The National Policy Statement for Renewable Electricity Generation Technical Guide[1]. These practical constraints all relate to *the ability to physically harness the wind energy resource to generate electricity* and then *export the electricity to the local distribution network or the national grid.*

Physically harnessing the wind energy resource to generate electricity

Practical constraints associated with physically harnessing the wind energy resource to generate electricity relate to the suitability of:

1. wind speeds
2. available equipment
3. land and access.

Wind speeds

Wind farms typically require a consistent and good average wind speed. The following characteristics are often key technical considerations for assessing the wind resource at any particular site:

- average hub height wind speed
- turbulence
- extreme wind speeds
- wind shear
- flow conditions.

The wind turbine selected for a particular wind farm will depend on these key considerations plus the availability of turbine technology and various commercial considerations, both of which are highly time dependent.

It is not always practical for a developer to stipulate the exact turbine characteristics prior to seeking consent approval. This is largely because different-sized turbines require different spacing to avoid "wake" effects that can influence the utilization of the available and suitable land area. A thorough commercial evaluation and tender process is required to examine the above issues and identify the final model after all the necessary regulatory consents are obtained. Accordingly, a developer might seek flexibility in the turbine design and location and might identify a number of potentially suitable wind turbine models. In such cases, the "worst case scenarios" of the environmental effects would need to be assessed. Some technical assessments, for example, noise in accordance with NZS6808 2010, require actual turbine models to be stipulated to allow accurate modelling.

National Policy Statement for Renewable Electricity Generation Activities

Policy C1 of the NPSREG requires decision makers to have particular regard to the practical constraints associated with the development of wind farms. Policy C1 lists the following constraints associated with renewable electricity generation activities:

a) the need to locate the renewable electricity generation activity where the renewable energy resource is available;

b) logistical or technical practicalities associated with developing, upgrading, operating or maintaining the renewable electricity generation activity;

c) the location of existing structures and infrastructure including, but not limited to, roads, navigation and telecommunication structures and facilities, the distribution network and the national grid in relation to the renewable electricity generation activity, and the need to connect renewable electricity generation activity to the national grid;

d) designing measures which allow operational requirements to complement and provide for mitigation opportunities; and

e) adaptive management measures.

1 Refer pages 48-49 in The National Policy Statement for Renewable Electricity Generation Technical Guide, 2013. Available from EECA's website: www.eeca.govt.nz/resource/national-policy-statement-renewable-electricity-generation

Available equipment

Wind turbine technology is advancing at a very high rate. Developers need to ensure that resource consents enable the newer more efficient technologies to be used rather than being tied in to older technology that may have been considered initially.

Most wind turbines are manufactured overseas and developers compete in an international market when purchasing wind turbines. This means the international exchange rate has a significant influence on the cost and availability of wind turbines.

Importing wind farm components from overseas can introduce additional logistical hurdles. For example components for a single wind turbine may be manufactured in numerous factories in different countries. In some cases ancillary equipment may also need to be imported. For example a 600 tonne crane was shipped to New Zealand from Denmark especially to construct the Te Uku wind farm.

Land and access

Access to land is a critical component of accessing the wind resource. Land access constraints can include:

- compatibility of the project with existing land uses and securing legal access to the land and access routes
- understanding the suitability of the ground conditions and civil engineering requirements including the size of the land area and topography to accommodate the turbines, and the construction of low grade roads required to transport wind farm components and heavy construction vehicles (e.g. cranes, concreting trucks)
- accessibility to existing transport infrastructure, such as ports or wharves for receiving shipped components and public roads suitable for transporting heavy overload vehicles, is another consideration
- environmental considerations, including the logistics associated with assessing and managing environmental effects associated with each component of a proposal
- securing legal access to use the land, and a determination from the Civil Aviation Authority, including all necessary resource consents.

The ability to export the electricity to where it may be used

Once harnessed, electricity generated from a wind farm needs to be connected to the national grid or the local distribution network so that it can be transported to end users.

Electricity from a wind farm can be sold:

- on the spot electricity market;
- as part of an electricity retailer's portfolio; or
- directly to a consumer.

Practical constraints associated with transmitting and selling the electricity revolve around:

- the ability of the electricity generator to secure legal and physical access rights for the transmission
- the capacity of the electricity transmission network to accommodate the additional generation
- the ability of the electricity generator to sell electricity over a long term.

These practical constraints are often heavily influenced by the distance between the wind farm and the point of connection to the national grid and/or distribution network in relation to the demand centre. For example, a high transmission cost close to a demand centre may be more acceptable compared to a low transmission cost located away from a demand centre.

Wind farm developers and electricity generators that do not have an existing retail function need to enter into a long term power purchase agreement with an electricity retailer or sell on the spot market.

Securing an off-take/power purchase agreement can be a significant determinant as to whether or not a wind farm project will proceed.

Te Uku

More Information

Find out more about wind energy and wind farms in New Zealand at www.windenergy.org.nz.

NZ Wind Energy Association

PO Box 553, Wellington 6140,
New Zealand

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